

# Following the “Community” Thread From Sociology to Information Behavior and Informatics: Uncovering Theoretical Continuities and Research Opportunities

**Tiffany C. Veinot**

*School of Information, University of Michigan, 4429 North Quad. 105 S. State Street, Ann Arbor, MI 48109-1285.  
E-mail: tveinot@umich.edu*

**Kate Williams**

*The Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign,  
501 E. Daniel Street, MC-493, Champaign, IL 61820-6211. E-mail: katewill@illinois.edu*

**The authors review five paradigms from the discipline of community sociology (functionalism, evolution, conflict, interactionism, and exchange) to assess their potential utility for understanding everyday life information behavior and technology use. Their analysis considers the ways in which each paradigm defines the concepts of community, information, and technology. It also explores the insights offered by each paradigm regarding relationships between community and both information and technology. Accordingly, the authors highlight the ways in which existing information behavior and informatics scholarship draws from similar conceptual roots. Key insights drawn from this research, as well as remaining gaps and research questions, are examined. Additionally, they consider the limitations of each approach. The authors conclude by arguing for the value of a vigorous research program regarding information behavior and technology use in communities, particularly that which takes the community as the central unit of analysis. They consider key questions that could drive such a research program, as well as potentially fruitful conceptual and methodological approaches for this endeavor.**

## Introduction

Today, a variety of groups are referred to as “communities”—from professions to ethnic groups to neighborhoods to social movements to online discussion groups. Increasing a sense of community is advocated as a solution to numerous social ills, such as crime and poverty (Hopper, 2003).

Moreover, the concept rhetorically invokes notions of belonging, warmth, and security (Bauman, 2001).

In information studies research, the concept of community has also gained currency. Information behavior researchers are increasingly interested in knowledge production, sharing, and consumption in communities—although most scholarship to date has focused on scholarly and professional contexts (Talja, Tuominen, & Savolainen, 2005). A new field of community informatics has also emerged that focuses on how geographic communities navigate information and communication technologies (ICTs), with research also increasingly embracing virtual communities (Williams & Durrance, 2008, 2010).

Although scholars have enthusiastically injected ideas about community into information studies research, this work has been limited by the theoretical challenge of operationalizing ideas of “community.” Moreover, there has been little cumulation of knowledge in the field, as well as an underutilization of advances in cognate areas.

We address these gaps in the literature by synthesizing community-oriented theory and research from three related fields: information behavior, community informatics, and community sociology. This review is organized by the major paradigms of community sociology: functionalist, ecological, conflict, interactionism, and exchange. Within each paradigm, we consider (a) concepts of community, information, and technology that typify each approach; and (b) scholarship regarding relationships between community and both information and technology.

We conclude by arguing for the value of a vigorous research program regarding information behavior and technology use in communities, particularly that which takes

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Received February 21, 2011; revised July 28, 2011; accepted August 1, 2011

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the community as the central unit of analysis. We consider key questions that could drive such a research program, as well as potentially fruitful conceptual and methodological approaches for this work.

## Scope and Definitions

In this article, we adopt a broad understanding of community, while focusing on the idea of “belonging” (Delanty, 2004). Accordingly, this review reflects the diversity of sociological conceptualizations of community as a locality or place, a social system, a form of social exclusion, a type of relationship, a social network, and an interaction (e.g., Brint, 2001). Additionally, the review takes an inclusive approach to “information” phenomena, including scholarship concerning the production and circulation of information; information seeking, sharing, assessment, and use; information sources; ICTs; and “informing institutions,” such as libraries and community technology centers (CTCs).

Sociology addresses the collective basis of social relationships, thus making it an excellent resource for community information studies. Early works by such luminaries as Durkheim (1893/1960), Marx (1857/1973), Simmel (1908/2009), and Weber (1920/1947, 1925/1968) investigated the impact of industrialization on human communities. Thus, community sociology is foundational to sociology as a whole; moreover, its pursuit has been ongoing for much of the last century (Brown, 2002).

Reflecting its wider discipline, the community sociology field draws from several conceptual paradigms. Following Ritzer (1975), we define a paradigm as the “fundamental image of a subject matter . . . what should be studied; what questions should be asked; how they should be asked; and what rules should be followed in interpreting the results. . .” (p. 157). Sociological paradigms are oriented towards (a) macro-level investigation of large-scale patterns of social life, in which societies are treated as totalities; and (b) micro-level investigations of small-scale groups. Community sociology has adopted both perspectives; thus, we examine three macro-sociological paradigms (functionalism, evolution, and conflict) and two micro-sociological paradigms (interactionism and exchange).

We exclude community-oriented scholarship rooted in anthropology and cultural studies (e.g., Cohen, 1982; Goodman, 1960), political science (e.g., Selznick, 1992), psychology (e.g., Dalton, Elias, & Wandersman, 2007), and geography (e.g., Holloway & Hubbard, 2001). Furthermore, we selectively highlight information studies scholarship that (a) explicitly locates itself within one of the aforementioned sociological paradigms, (b) cites sociological theory and research belonging to one of these paradigms, or (c) draws upon key community sociological concepts belonging to a paradigm. Therefore, we do not provide comprehensive reviews of information behavior and community informatics scholarship, emphasizing only representative works that overlap with community sociology. Hence, we exclude research from the constructivist, constructionist, and

sociocognitive traditions in information studies (e.g., Hjørland, 2002; Talja et al., 2005; Wilson, 2006) because their roots differ from those of community sociology. Our analytical review, with its specific focus, therefore complements recent comprehensive reviews of information behavior (e.g., Case, 2006; Fisher & Julien, 2009) and community informatics (e.g., Loader & Keeble, 2004, Haythornthwaite & Hagar, 2005; Williams & Durrance, 2008).

## The Functionalist Paradigm

Functionalism explains how large-scale social units work by analyzing the functions of institutions and their interrelations. The intellectual roots of this paradigm belong to classical French sociologist Durkheim (1893/1960), who viewed society as an organism in which interacting, mutually adjusting parts serve particular functions, thus helping the whole social organism to survive. Functionalism focuses on how social systems promote social differentiation, solidarity, and stability. The approach dominated community sociology between the 1950s and 1970s (e.g., Warren, 1971). Typically, functionalist community studies analyze the formal institutions of communities, their interrelationships, and how they form a coherent whole (Bernard, 1973).

Since the 1980s, neo-functionalist scholars have extended classical functionalism by rejecting the idea of social consensus as the basis of social organization, instead emphasizing contingency and conflict (Alexander, 1998). Moreover, with the work of German sociologist Luhmann (1995), concepts of communication have been thoroughly incorporated into this tradition, such that social systems have been theorized as domains of communication.

### *Community in Functionalism*

Communities are social systems that are geographically delineated (e.g., Stacey, 1969). These social systems are comprised of statuses, roles, groups, and institutions—each one building upon the other, and each having a specific territorial location and orientation. One strand of work describes community institutions, such as “residential location,” “occupation and work premises,” and the “communicative complex” (Parsons, 1965). A second strand focuses primarily on interactions between community institutions, such as organizations that coordinate interinstitutional relationships (e.g., Bates & Bacon, 1972).

The framework suggests that processes of psychological, social, or geographical “boundary maintenance” encourage group cohesion. For example, psychological boundaries include ideas about who is and is not a member; social boundaries include divisions of sociability; and geographic boundaries include political jurisdiction (Poplin, 1979). This perspective does not explicitly address the power differentials that may accompany social boundaries—an insight more aligned with the conflict paradigm (to be discussed).

As for neo-functionalists, Luhmann (1995) emphasizes the *communicative* nature of community systems. Building on

Luhmann, Connell (2004) argues that the basic meaning in a community system is that of “inclusion/exclusion,” which refers to “the way persons are taken into consideration” in “communication processes” of social systems (p. 150). Community systems rely on shared meanings and practices to achieve inclusion and to confirm identity (Connell, 2004). Connell (2004) argues that the community system exists to make the idea of a “common world” seem possible in a highly complex society.

### *Information and Technology in Functionalism*

Classical functionalism treats information transmission as an institutional activity. Parsons (1965) identifies the “communicative complex” as a locality-relevant community institution because communicating must involve “physical media”—face-to-face communications or technologies. Information is defined as a transmitted message that changes the cognitive content available to the recipient (Parsons, 1965). Similarly, Sanders (1966) discusses “education and public information” as a major social system within communities—including schools, newspapers, radio, and television. The communicative complex and education/information systems thus facilitate local communication and information exchange. Regrettably, scholars working in this tradition have rarely, if ever, studied libraries in communities.

For neo-functionalist Luhmann (1995), information is a fundamental component of social systems. He defines information as one of the three “selections” necessary for communication to occur, along with utterance and expectation that the selection will be accepted. Information is thus conceptually close to the idea of “meaning” because information has meaning, and the reproduction of meaning is accomplished with information; however, information is differentiated by its newness.

Functionalist scholarship uses empirical definitions of technology. Although early scholars used a concept of “physical media,” recent work addresses ICTs. Functionalists also maintain an interest in institutions that produce and circulate information.

### *The Relationship Between Information and Community*

One strand of functionalist scholarship considers the role of information in the maintenance of community. Parsons (1965) argues that the communicative complex serves a coordinating function within communities. Luhmann (1995) also argues that information serves a function for social systems by allowing them to evolve with greater complexity and interdependence. Moreover, information allows a social system to bind itself together and to reproduce itself.

Also, from an explicitly neo-functionalist perspective, information science scholar Lievrouw (2001) argues for the mutual constitution of social organization and the “information resources, communication relations and enabling technologies” that belong to different groups (p. 12). Information

and communication technologies reinforce the separateness of communities by allowing them to increasingly communicate within themselves to the exclusion of others—a process called “social differentiation” (Lievrouw, 1998, 2001).

Regarding the production of information, Luhmann (1995) sees the presence of a “social system” as a precondition for the existence of information because social systems delimit possibilities. Hence, social systems determine for themselves what information is, and one must understand the community to determine that which is informative within it.

Similarly, Lievrouw (2001) introduces the concept of an “information environment,” which she defines as a “social setting or milieu in which information resources, communication relations and enabling technologies undergo a . . . process of change called *informing*” (p. 12). For Lievrouw (2001), information environments include institutions such as government, business, and media that “produce and broker information for the community at large” (p. 13). Additionally, information environments include networks of people creating and sharing information with others. Information environments vary because they are “constituted by people who share a sense of understanding. . . and therefore of belonging together” (p. 15).

Drawing from information environments theory, Veinot (2011) investigated human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) information environments in three rural Canadian regions. Supporting the basic tenets of the theory, findings showed variability in the information environments of each region, at both institutional and network levels. Furthermore, confirming the importance of regional differences in information environments, success in obtaining HIV/AIDS information differed by region.

### *The Relationship Between Technology and Community*

Reflecting its empirical, case-based origins, sociological paradigms in community informatics are more often implicit than explicit. Functionalist approaches are reflected in community informatics in several ways. First, community informatics is rooted in library science scholarship that advocated community information and referral (I&R) services as a response to the urban upheaval of the 1960s (Anthony, 2010). Second, Bertot, McClure, and Jaeger (2008) and Bertot, Jaeger, and McClure (2011) have studied the provision of public access computers by public libraries in the United States since the mid-1990s.

Third, community informatics studies often focus on the activities and performance of social institutions (O’Neil, 2002). Virnoche (1998) examined an electronic community network, identifying competing constituencies that supported either civic or commercial goals, which gave rise to tensions regarding design, marketing, and user support. Turner-Lee and Pinkett (2004) affirmed asset-based community development theory in their work on community networks. Vos and Ketelaar (2008) explained how an interinstitutional collaborative collected materials to address a city archive’s gap in

immigrant community content. Williams (in press-a) examined the public library's role in bridging everyday digital divides and identified their role in helping with patrons' "informatics moments." Furthermore, Lih (2009) showed that institutional norms promulgated by Wikipedia affected its stability and growth.

### *Implications for Future Research*

Functionalism brings a focus to the overarching question: What features of communities matter for access to information among their residents? The functionalist interest in institutions and their interrelationships provides units of analysis through which to consider variable patterns in the production, circulation, and use of information in a community.

Additionally, functionalism guides researcher attention to relationships between community institutions and their informational effects. This approach allows researchers to examine interorganizational strengths and weaknesses in information exchange. Moreover, although functionalist theory does not explicitly consider libraries, potential exists for it to theorize the role of libraries in communities. Building on community informatics scholarship, this approach also assesses the co-constitution of institutions and community technology initiatives.

Furthermore, this framework provides clues for conceptualizing the effects of information exchange and technology use in communities. Although adopting a deterministic view of the "function" of information for communities is not useful, those phenomena that were previously identified as "functions"—such as coordination or adaptation to environmental change—may be empirically testable effects of information flow. Within information studies, research regarding community problem solving (e.g., Durrance, Souden, Walker, & Fisher, 2006) could contribute to understanding the role of information and ICTs in community adaptation. Additionally, (neo-) functionalist scholarship raises questions about how information and ICTs may influence the establishment and maintenance of community boundaries.

An important limitation should be considered when conducting functionalism-inspired research. Because of its age, technology-mediated forms of sociability, such as those found in e-communities, are not well addressed in this work. Indeed, much functionalist scholarship is devoted to a territorial understanding of community. However, neo-functional scholar can accommodate more variable community types.

## **The Evolutionary Paradigm**

The evolutionary paradigm draws on ecological and genetic theory. Like functionalism, it traces its roots to Durkheim, but was also influenced by classical European sociologists Spencer and Comte, as well as biologist Darwin (Turner, 1998). Human ecology, the dominant evolutionary approach, was also one of the earliest community sociological approaches. The "Chicago School" approach to human

ecology views human communities as analogous to plant and animal communities that collectively adapt to their environments to meet sustenance needs (e.g., McKenzie, 1933). Although most influential in the early 20th century, there is revived interest in "Chicago School" scholarship (Abbott, 1997). Additionally, information studies researchers have adopted the concept of "ecology" as a metaphor for context or environment.

### *Community in the Evolutionary Paradigm*

Human communities are territorial; they have a biotic substructure in which individual human beings compete for resources, as well as a cultural superstructure and division of labor that organizes, integrates, and directs the energies of competitive individuals (Park, 1952). By restricting the competition of individuals, society achieves equilibrium in a process of collective adaptation.

Human ecologist Park (1915) also described a type of community unique to cities—"communities of interest." For Park (1915), cities permit people to connect based on shared needs and benefits, rather than sentiment and habit. Similarly, Wirth (1938) argues that in cities, residents create "fictional kinship groups" and "interest units" to achieve their collective ends. Fischer (1975) also argues that cities are home to intense subcultures with social, rather than geographic, boundaries.

Within informatics, Nardi and O'Day's (1999) information ecologies framework is closely aligned with human ecology—although it does not cite this work. Nevertheless, drawing from similar roots in ecological theory, Nardi and O'Day (1999) define an "information ecology" as a "system of people, practices, values and technologies in a particular local environment" (p. 49). Like human ecology, information ecology theory asserts that equilibrium is a desirable community state.

In information behavior, Williamson's ecological theory of information behavior (2005) stands out in its use of an ecological metaphor to represent one's environment. This model positions the individual at the center of an immediate context that includes personal networks, mass media, and institutions—and then within a wider context, including values and physical environments.

### *Information and Technology in the Evolutionary Paradigm*

Chicago School scholars investigated the social functions of mass media, such as newspapers in cities, especially as compared to village gossip (e.g., Park, 1925/1967). Chicago sociologists also investigated the diffusion of new information within cities (Fischer, 1975). Accordingly, human ecologists investigated phenomena compatible with a range of conceptions of "information": information as a meaning (Raber & Budd, 2003; e.g., messages about other people in a community); "information-as-thing" (Buckland, 1991; e.g., newspapers), and "information-as-process" (Buckland, 1991; interpersonal conversation, diffusion). However, in

keeping with its information behavior roots, Williamson's model (2005) primarily conceptualizes information as a form of help.

Human ecologists investigated technologies of interpersonal communication and transportation, such as automobiles and telephones, as a set of "tools" used by a population. Micklin and Sly (1998) argue that technologies should be studied by describing the number of tools available to a population, the types of tools in use, their effect on physical activity, and their spatial distribution. Nardi and O'Day's (1999) model is similarly focused on technologies as tools, but they focus on "relationships involving tools and people and their practices" (p. 50), reflecting a socio-technical perspective. Other community informatics research in this tradition adopts empirical approaches to technology, thus examining whatever ICTs were used in a given project.

### *The Relationship Between Information and Community*

Sociological human ecologists' interest in information-community relationships addresses three main issues: (a) social integration, (b) community size and complexity, and (c) social change dynamics. This work treats social organization and change as the outcomes (or dependent variables) of interest, with information phenomena acting as inputs (or independent variables) in these processes. With regard to social integration, communication is posited to maintain communities as functional units by integrating, synthesizing, and consolidating the functions of individuals and groups (Park, 1952). Technologies also facilitate functional integration of a community—primarily by facilitating its environmental adaptation.

Communication and transportation technologies are theorized as determinants of community size and complexity because they facilitate communication, access, and exchange among interdependent populations (e.g., Schnore, 1958). Broadly, as will be discussed, this view may be characterized as technologically determinist.

Human ecologists also argue that communication and technologies are linked to social change (McKenzie, 1925/1967). Community change may occur because technologies facilitate higher rates of interaction between people, dissolve physical distance, and promote inter-community information diffusion (Fischer, 1975; Hawley, 1986; Park, 1952).

Information behavior treatments of the relationship between community/ecology and information retain a different focus. Here, attention is accorded to information acquisition as an outcome (or dependent variable), with elements of community forming the inputs (or independent variables). Consequently, Williamson's (2005) model focuses on the information acquisition-related interactions between people and their environment, positing that community environments influence the selection of information sources. Veinot, Harris, Bella, Rootman, and Krajnak (2006) extended this model to consider the availability of specific forms of information in communities.

### *The Relationship Between "Technology" and "Community"*

Community informatics aligns with the evolutionary paradigm in studies of how people make sense of and operate in an environment that includes ICTs. Agre and Schuler's (1997) work is an important example of this, as is Schuler's discussion (1996) of the Seattle Community Network. Clark (2003) analyzes how varied constituencies make sense of a community telecenter and what transpires as a result of this ecology of objectives. Pitkin (2006) reflects on the impacts of offering city residents free online access to property-level government data. Hampton (2007) designs and implements neighborhood-based ICTs and identifies their contribution to local social networks and communication. Ludlow (2007) identifies how users take ownership of commercial virtual environments. Two much-referenced volumes, Gurstein (2000) and Day and Schuler (2004) provide numerous examples of the evolutionary paradigm.

### *Implications for Future Research*

Sociological human ecologists posit that communication and associated technologies are central to the life of communities. This provides a foundation for research questions about the role of information behavior, sources, and ICTs in achieving community outcomes, such as social integration, community structure, and change. Moreover, they provide theoretical traction for investigating the interrelationships between information, ICTs, and other aspects of community life.

The evolutionary paradigm's focus on contextual relationships provides leverage for examining information acquisition in communities, and how information infrastructures could be designed to better inform community members. However, human ecology has important limitations that should be considered. Like functionalism, the human ecological approach views society as tending towards equilibrium (Smith, 1995). Accordingly, human ecological views do not acknowledge the social inequality and conflict that may tend to disrupt this equilibrium (Letiche & van Mens, 2003). Moreover, recent ecological scholarship has questioned ideas of "balance" in nature because significant disturbances to ecosystems occur more frequently than has typically been acknowledged (Worster, 1994). Consequently, the assumption of balance may not hold in nature, let alone human communities. Thus, the field may profit from a more dynamic understanding of the community-information-technology nexus.

Additionally, the technological determinism of early sociological human ecology must be brought into a more social perspective. Technology itself should be considered a social product (Smith, 1995), and its adoption and uses within groups are complex and indeterminate (see, for example, Oudshoorn & Pinch, 2003). Nardi and O'Day's (1999) information ecologies framework challenges technological determinism, and therefore, may aid contemporary researchers.

## The Conflict Paradigm

The conflict paradigm places issues of power, domination and resources at the center of its analyses. Also called the “critical paradigm,” classical theoretical antecedents include Marx (1857/1973), who examined the exploitation of labor under capitalism, and Weber (1925/1968), who posited multiple, independent sources of social power. Mills’ (1956) sociological study of the class structure in the United States, which extended the ideas of Marx and Weber for the mid-20th century, was also influential. Neo-Marxist French philosopher Lefebvre (Lefebvre, Brenner, & Elden, 2009) also inspired community sociologists through his analysis of the capitalist production of space through the “circuit” of real-estate investment. More recently, we have seen the influence of the “regulation school” of political economists, including scholars such as Aglietta (1979), Lipietz (1992), and Harvey (1994). Regulation theorists describe a contemporary “Post-Fordist” economy characterized by capital internationalization, “just-in-time” production, flexible employment, and economic deregulation (Stevenson, 2010).

Conflict-oriented scholarship examines the political and economic processes underpinning community life. Consequently, these scholars have paid more attention to economic markets (such as labor and real estate), corporations, governments, and socioeconomic elites than have scholars working in functionalist and evolutionary traditions. Beginning in the mid-1940s, a key theme in this work has been to link broad economic trends to local communities (e.g., Goldschmidt, 1946; Mills & Ulmer, 1946). One contemporary strand of research examines the connections between absentee corporate ownership and economic concentration, civic participation, and community well-being (e.g., Blanchard & Matthews, 2006; Young & Lyson, 1993).

Researchers also examine the production of communities marked by uneven development and social exclusion. Such research tracks the role of deindustrialization and globalization in the concentration of poverty in urban neighborhoods (Gottdiener & Hutchison, 2011). Furthermore, researchers investigate discriminatory processes that support the production of racially and economically segregated communities (e.g., Massey & Denton, 1993; Vesselinov, 2008).

Scholars also investigate economic growth within communities as a form of capital accumulation and the attendant community forms (e.g., suburban developments) that emerge from this. Relatedly, inspired by Mills (1956), researchers examine the power structure of communities and the influence of elites on local governments (Domhoff, 2007).

### *Community in the Conflict Paradigm*

Communities are socially stratified geographic territories. As such, they are a form of social exclusion that manifests through the spatial clustering of people according to social class and race. Place-based divisions are not simply the product of consumer choice; rather, they are actively produced. Segregation is accomplished through processes such as racial discrimination in housing and the selective

development and marketing of physically gated communities (e.g., Massey & Denton, 1993; Vesselinov, 2008). In an urban setting, Castells (1989) names such divisions the “dual city” in which managerial elites working in the information economy create segregated communities that are “spatially bound, interpersonally networked subculture[s]” (p. 446). Therefore, this scholarship interrogates the division or “splintering” (Graham & Marvin, 2001) of territories into socially stratified places, such as “ghettoes” and “privileged enclaves” (Marcuse, 1997). Similarly, rural community sociologists highlight the division of territories into economic cores and peripheries (Lobao, 1996). Lash (2002) uses the term “zone” to identify places differentiated by their relative incorporation into the information economy.

Scholars assert that place of residence, because of its alignment with civic infrastructure, social ties, and economic opportunities, affects people’s collective life chances (Squires & Kubrin, 2005). Accordingly, socially stratified places have also been called “communities of fate” (Logan & Molotch, 1987).

Following Lefebvre, Brenner, and Elden (2009), scholars examine communities as a form of economic production, or a site of capital accumulation—a view that prompted Molotch and Logan (Logan, & Molotch, 1987; Molotch, 1976) to call communities “growth machines.” This line of research investigates the roles of the real-estate industry, local socioeconomic elites, and governments in promoting suburbanization and new developments (e.g., Gottdiener & Hutchison, 2011; Squires & Kubrin, 2005). Of particular interest is the rise of the “entrepreneurial” cities and towns, which compete with other places for global investment, federal government funds, and consumption dollars (e.g., tourism; Harvey, 1994). Additionally, researchers link economic globalization with people’s greater international movements, which has resulted in the creation of new ethnic enclaves (Diaz, 2005; Fong, 1994), as well as “transnational” communities, which are often located within cities (Portes, 2000).

Scholars who examine community-level civic engagement and well-being tend to examine communities as local administrative units, such as cities, towns, or counties (e.g., Goldschmidt, 1946; Young & Lyson, 1993). Similarly, with a concern for local politics, community power researchers typically take the boundaries of communities as delineated by local governments (e.g., Allen & Dillman, 1994; Nevarez, 2008).

### *Information and Technology in the Conflict Paradigm*

In an increasingly “informational” economy, information is a form of power—a kind of economic power because it is both the raw material and the product of economic activity. Furthermore, generation and processing of information drives economic productivity and competitiveness (Castells, 2009). Lash (2002) highlights this trend when he argues that power is tied to the commodification of information through intellectual property mechanisms.

Relatedly, actors also gain power through their inclusion in information networks, and their attendant ability to locate, store, and process information (Castells, 2011). Similarly, Lash (2002) argues that social inequality primarily operates via exclusion from global information flows.

Conflict-oriented theorists argue that technologies both instantiate and shape social relations (Castells, 2009); hence, they are “embedded instruments of power, dominance and (attempted) social control” (Graham & Marvin, 2001, p. 213). For example, technologies facilitate the distant control of work and other processes through their use to “specify ways of doing things in a reproducible manner” (Castells, 2009, pp. 28–29).

Technologies, like information, are also inequitably distributed. Graham and Marvin (2001, p. 11) argue that technologies are bundled into infrastructures like telecommunications, which then become “congealed social interests” that “sustain ‘sociotechnical geometries of power.’” Infrastructures reflect power by providing benefits for some and barriers for others.

From an economic point of view, the transition to an information-based economy means that technologies are increasingly the “means of production” (Stevenson, 2009). Conflict theorists also investigate the territorial organization of technological industries, such as software and entertainment (e.g., Castells, 2009; Nevarez, 2008).

#### *The Relationship Between Information and Community*

Spanish neo-Marxist sociologist Castells (1989, 2009) and British sociologist Lash (2002) argue that the transition to an information-based economy has resulted in the emergence of greater socioeconomic divisions between places. In this new economy, flows of information help to define community membership. Within cities, high-status employment in the new information economy (e.g., finance, science, and technology) is contrasted with the contingent work and poverty experienced by other urban residents.

This social inequality gives cities a “dual” character whereby exclusive, privileged communities and their impoverished counterparts are exposed to differential information flows (Castells, 1989, p. 227). Similarly, Caidi, Allard, and Quirke (2010) argue that the inequitable access to information experienced by immigrants is a form of social exclusion. Lash (2002) stresses that the relative density of information flows produce “live zones” and “dead zones”; these zones are an expression of social class in the information age. Hence, the differential flow of information helps produce and/or maintain the social stratification of territorial communities. Stock (2011), an information science scholar, developed indicators of the urban transition to an information economy with a goal of smoothing this transition.

The differential representation of cities in information systems is also of interest. Burrows and colleagues (Burrows, & Ellison, 2004; Burrows, & Gane, 2006) examine the “informatization” of neighborhoods through technologies such as online geographic information systems (GIS).

They suggest that such systems may reinforce neighborhood boundaries. For example, GIS can be used by elites to select home neighborhoods that offer “best” schools for their children.

#### *The Relationship Between Technology and Community*

Like information, technologies are also viewed as contributors to some of the social divisions that define communities. Graham and Marvin (2001) examine the “unbundling” of technological infrastructures through processes of deregulation and privatization, and how this facilitates the construction of exclusive enclaves in urban areas around the world. Graham (2002) argues that the differential application of ICTs allow affluent residents to “bypass” local conditions, as well as to maintain social distance from those who are less powerful. Loader and colleagues (Hague, & Loader, 1999; Loader, 1998; Loader & Keeble, 2004) highlight community informatics work that draws from the conflict paradigm, as does a collection of papers inspired by Castells’ dual city concept (Schön, Sanyal, & Mitchell, 1999). A vivid example drawn from this collection concerns public housing residents who mobilized online support to save their apartments from demolition (Mele, 1999).

Concern about the uneven distribution of technologies has spawned efforts to both document and diminish the “digital divide,” which is one dimension of Castells’ dual city concept. As a conceptual guide to the problem, useful theorizations of the digital divide (Clement & Shade, 1998; Dimaggio & Hargittai, 2001; van Dijk, 2005) align with each other quite neatly (Williams, in press-b).

Since the early 1990s, the Department of Commerce has worked with the U.S. Census Bureau to collect national statistics on the digital inequality (e.g., U.S. Department of Commerce, 2011). Additionally, American communities have introduced CTCs, extended Internet access provided in public libraries (Bertot, Jaeger, & McClure, 2011) and implemented numerous projects, helped by funding streams from the Department of Commerce and others (Williams, 2007). Related evaluative research has examined the impact of ICTs on digital, and more broadly, social inequality. For example, Rogers, Collins-Jarvis, and Schmitz (1994) evaluation of a city’s “electronic communication system,” found that it contributed to greater social equality. However, Kvasny (2006) assessed the impact of an urban technology center and found that digital inequality was reproduced rather than overcome. Researchers have also examined access to such services. For example, Alkalimat and Williams (2001) investigate a city’s public computing environment and discover that government facilities equalize provision, but these facilities are disproportionately available to the most and the least digitally divided neighborhoods.

Information and communication technologies may also maintain transnational communities. Information science scholars have described the information worlds of immigrants as “diasporic information environments,” which include both local and transnational information worlds (Srinivasan &

Pyati, 2007). Such environments may involve intensive use of ICTs to facilitate consumption of ethnic media and communication with people in one's home country (Caidi et al., 2010).

Technologies, such as municipal wireless Internet access, also become foci for community investment as cities scramble to add cultural and infrastructural amenities that will attract global investment (e.g., Bennett, 2006) and provide the quality of life demanded by information industry employees (Nevarez, 2008). Governments may also invest in digital libraries and related services to support development of a knowledge-based economy within their borders (Stock, 2011). Accordingly, ICTs become important components of community economic development strategies. Similarly, at a more macro level, information science scholars assert that public library services, such as provision of free Internet access, meet the demands of the capitalist economy (Luyt, 2001; Stevenson, 2009).

### *Implications for Future Research*

This review reveals a need for more empirical work to verify and refine the theoretical contributions of the conflict paradigm. For example, although Castells (2009) and Lash (2002) highlight the role of information flows in establishing community boundaries, their work is primarily theoretical and on a broad geographic scale. Consequently, we know little about the "on the ground" dynamics of these posited macro-level trends. To date, few studies have empirically investigated differential information flows at a community level: how they can be measured, who is affected, how they work, their causes, and their effects.

Similarly, although Graham and Marvin (2001) provide case studies of "splintering" urban infrastructure, we still know little about which communities are formed as a result of this differential access, how this works, and again, with what effects. Moreover, there is a need to better understand the strategies marginalized communities use to access or appropriate ICTs (Graham, 2002).

Due to these gaps, it remains difficult to describe and explain information behavior and technology use in specific communities, whether they are privileged or disadvantaged. A better understanding of these issues is a critical step in determining how to achieve greater social inclusion.

As communities increasingly compete with one another for capital investment and tourist dollars, there will be an ongoing need to investigate the role of technological investments within "entrepreneurial" communities. The role of public libraries in such efforts has scarcely been examined (see Heinlein, 2007, for a discussion of this issue at a national level). Yet, libraries might be treated as cultural amenities with the power to attract residents or visitors. At the same time, libraries may be financially undermined as municipalities concentrate their resources in tax holidays and infrastructural investments for global investors. Accordingly, the place of libraries in community economic development is a potentially rich area of investigation.

Community power structure research, while popular in sociology, has also inspired limited information studies research. However, this field's focus on local elites and municipal governance would appear a natural fit with studies of libraries or technology centers. Indeed, because libraries are primarily funded by municipal governments (Davis, 2011), and are often embedded within them, we could investigate the role and embeddedness of libraries in communities from the point of view of the involvement of elites in their governance.

Similarly, previous research on the relationship between local economies, civic infrastructure, and community well-being does not have an information studies counterpart. However, there is value in examining these relationships in the context of information-based economies to understand the implications of community economic development strategies.

### **Interactionist Paradigm**

Interactionism has been a key sociological paradigm since the 1930s. Its classical roots lay in Weber's (1920/1947) theory of social action. Drawing from pragmatist philosophy, interactionists view human beings as active creators of their social realities, and they investigate how this reality is created and maintained. Symbolic interactionism, a subtype of interactionism, has been applied extensively to community sociology. This paradigm grew from the work of Chicago sociologist Mead (1934) and his student, Blumer, who produced several key symbolic interactionist statements in the 1960s (e.g., Blumer, 1969). Symbolic interactionism takes the dynamic, situated "interaction" as its basic unit of analysis and focuses on how people communicate, interact, and create meaning in their worlds (Slattery, 2003).

Additionally, an interactional approach developed autonomously within rural sociology. This approach, called "community interactional theory," was first articulated by Kaufman (1959) and was carried forward by his student, Wilkinson (1991) and colleagues, including Bridger, Luloff, and Krannich (2002).

### *Community in the Interactionist Paradigm*

Interactionists view "community" as a form of interaction (Kempers, 2002). Communities are "made up of individuals who interact," and communities come into existence through communication and other forms of interaction (Charon, 1998; Flint & Luloff, 2005). Hence, community is understood as a process or an "emergent production" (Kempers, 2002).

Nevertheless, some interactions are viewed as more "community-oriented" than others—an idea initially found in Weber's classic work. For Weber (1920/1947), a social relationship can be "called 'communal' in and so far as the orientation of social action . . . is based on the subjective feeling of both parties . . . that they belong together" (p. 136). Echoing this idea, contemporary scholars identify communal interactions as different from others—for

example, as emotionally warm (Kusenbach, 2003). Drawing from a symbolic interactionist perspective, studies have been conducted regarding communities that coalesce around online interaction (Williams & Copes, 2005), cultural interests (Gardner, 2004), religion (Kempers, 2002), sexuality (Brown & Maycock, 2005), and geography (Lofland, 2003).

In contrast, community interactional theorists from rural sociology assert that place remains important in understanding community (Bridger et al., 2002). However, place is not the primary unit of analysis—it is simply its backdrop, with the boundaries of communities established through interaction. Symbolic interactionists, however, do not view geographic location as a necessary component of community (Gusfield, 1975).

### *Information and Technology in the Interactionist Paradigm*

Symbolic interactionists conceptualize communication as a central component of social life—with a particular focus on objects, symbols, and meaning. Social objects are objects to which human actions are directed and whose meanings are defined through ongoing interaction (Hewitt, 2003). They can include the self, other people, tools, the built environment, ideas, perspectives, emotions, and symbols (Charon, 1998; Lofland, 2003). Symbols, such as language, are a special kind of social object because their meaning is established through a community's consistent use of, and responses to, a given symbol (Hewitt, 2003). For symbolic interactionists, meaning is intersubjective because it relies upon these common symbols, as well as common definitions of situations. Further meaning exists in what people do and how they respond to others' actions (Hewitt, 2003).

The aforementioned concepts lead to an understanding of "information" as *meaning*, where meaning is an emergent human accomplishment conveyed through the use of social objects, particularly symbols such as language. These symbols are intersubjective and partially predetermined because they rely on inherited meanings, yet they are also continuously constituted and reconstituted in human action and interaction (Hewitt, 2003). Relatedly, informing is conceived as an interaction between two or more people or between people and objects.

An interactional approach to information is compatible with semiotic and social constructionist theories of information (e.g., Raber & Budd, 2003; Talja et al., 2005) because they are all rooted in culturalist theories that explain human action through symbolic configurations of meaning (Reckwitz, 2002). However, interactionist understandings of information adopt a different analytical focus—the interaction, whereas the others focus on language, discourse, and signification.

Symbolic interactionists conceptualize technologies as social objects. Boundary objects provide an illustrative example (Star & Griesemer, 1989). Boundary objects, such as documents, repositories, or images, span multiple social worlds, while satisfying the information needs of each and

facilitating translation between them. Accordingly, information is established through the interactions different groups have with these social objects, and their impact is on the level of meaning.

### *The Relationship Between Information and Community*

Symbolic interactionist researchers have contributed intriguing scholarship on community as a symbol. Indeed, Karp, Stone, and Yoels (1991) suggest that we live most deeply within our ideas of community. Similarly, Gusfield (1975) argues that "community" is made possible by symbols that give people a sense of collective experience. Researchers have emphasized the influence of place-based symbols on both our understanding of community and on community life itself (e.g., Lofland, 2003).

Symbolic interactionism's reference group theory also contributes to our understanding of the relationship between information and community. According to this theory, all people belong to "multiple social worlds," or reference groups, that are formed and maintained by symbolic interaction, and these groups provide us with perspectives with which to interpret the world (Shibutani, 1955). Information science researchers, particularly Chatman and colleagues, have used and cited key works in reference theory to situate information behavior within social groups (e.g., Chatman, 1999; Dawson & Chatman, 2001). Reference groups provide people with a worldview, which conditions what information they see as important (Chatman, 1999; Veinot, Meadowbrooke, Newman, Zheng, & Perry, 2010). Moreover, within reference groups, people may shield themselves from information seeking if this poses a social cost to them (e.g., Chatman, 1999; Veinot, 2009b). Research conducted in this tradition also articulates how specific forms of information might be developed through the interaction of groups (e.g., Chatman, 1999; Veinot, et al., 2010).

### *The Relationship Between Technology and Community*

Community informatics scholars draw upon symbolic interactionist concepts when they focus on the interactions between people and technology. Liff and Steward (2001) analyzed the relationships between stakeholders in a CTC, concluding that interactions were not sufficient to sustain the center. Qiu (2009) focused on interactions between people and technologies to create a subgroup of working class Chinese people. Lenstra (2011) gathered and digitized historical documents from a local community, which better connected the community to itself. Williams (in press-a) examined the community interactions through which people receive computer help in their daily lives.

In the virtual realm, Rheingold (1993) documents the formation and evolution of relationships in an online community. Researchers have examined the role of technology-mediated interaction in the creation and maintenance of social identities (e.g., McDonough, 1999). Bishop and Bruce (2005) have conducted research using a community inquiry model, which

emphasizes interaction within a community to implement innovation and ICT adoption.

### *Implications for Future Research*

The interactionist approach raises a number of potential research themes. One area concerns the role of information behavior, sources, and technologies in establishing the symbolic meanings attached to communities—whether face-to-face or virtual. The framework also presents questions about the interaction between community boundaries and the perceived relevance or credibility of information, as well as the potential social costs of seeking it. Additionally, interactionism raises questions about the production of information through social interactions in groups. This paradigm also raises questions about the types of informing interactions present in communities and networks (e.g., Veinot, 2009a) and the technological mediation of these interactions. The role of technologies in establishing community identities is also an intriguing area for research.

One issue should be kept in mind when applying an interactionist perspective to everyday life information behavior in communities. Critics have suggested that symbolic interactionism has an astructural bias, and thus fails to explain constraints on action that originate from social and historical contexts (Slattery, 2003). However, researchers can counter this potential drawback by drawing on interactionist “negotiated order” theory (e.g., Maines, 1982) or scholarship regarding the reproduction of social stratification through interaction (e.g., Collins, 2004).

### **Exchange Paradigm**

The exchange paradigm focuses broadly on “the benefits that people obtain from, and contribute to, social interaction” (Emerson, 1990), as well as the movement of valued things through social processes (Hall, 2003). Exchange theory, therefore, describes an actor’s pursuit of his or her interests through social interaction, where actions are contingent upon rewards (outcomes) acquired from others (Blau, 1964). Benefits are defined broadly, ranging from material to informational (Cook & Whitmeyer, 1992).

The exchange paradigm is indebted to Simmel’s (1908/2009) early work on social exchange and is further indebted to microeconomic notions of human behavior. Many works based on social exchange theory share the assumptions of rational choice theory: Individuals act in a rational, self-interested manner to obtain the greatest possible benefits for themselves.

Social capital theory is one of the most popular frameworks in the exchange paradigm (Field, 2003). The core idea behind “social capital” is that actors derive benefits, such as information and status, from their membership in social networks (Field, 2003). Coleman (1988) defines “social capital” as a resource available to actors that is a part of social structure. He defines social capital by its function—its ability to facilitate actors in achieving their goals. Coleman locates

social capital as a by-product of rational, purposeful, self-interested actions (Field, 2003). Similarly, Lin (2001) defines social capital as “investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of . . . actions” (p. 17). Hence, social capital functions as an intangible asset embedded in networks, and its benefits can be garnered both individually and collectively.

### *Community in the Exchange Paradigm*

The exchange paradigm provides two main conceptualizations of community: network and geographic aggregate. Network-based conceptualizations of community are rooted in social capital scholarship, and they may be treated as either whole networks with a population of ties or as egocentric networks that focus on an individual. Rooted in the latter approach, we find the concept of “personal communities,” which include individual networks of often geographically dispersed and heterogeneous primary ties (e.g., Wellman, Carrington, & Hall, 1997).

The network conception of community has also been applied to place-based communities, an approach that often examines the network-based social capital of individuals in a town, city, or region (e.g., Flora, 1998). Network-based investigations also extend to virtual communities, which have distinctive characteristics, including an emphasis on information sharing and interest-based intimacy (Wellman & Gulia, 2000).

The exchange paradigm is also home to conceptualizations of communities as administrative, geographic aggregates (Colclough & Sitaraman, 2005). Social capital studies of this nature typically use large, survey-based data sets where communities are delineated as an administratively defined set, such as zip codes (Ainsworth, 2002) or census divisions (e.g., Mitchell & LaGory, 2002). Because of the ubiquity of data organized by administrative territory (e.g., the census), such data offer comparability, as well as a basis for policy implementation. However, administrative boundaries may not always coincide with everyday life views of community boundaries.

### *Information and Technology in the Exchange Paradigm*

Information functions as a resource, a benefit, and, sometimes a form of social capital itself. Coleman (1988) declares that the “information that inheres in social relations” is an important form of social capital. Information also facilitates action by making people more aware of their options (Coleman, 1988; Lin, 2001). Although information seeking is seen as a purposive activity undertaken for personal benefit. For Coleman (1988), people use their social networks to gain information with minimal cost, leveraging networks to gain new information without having to seek it. Lin (2001) also discusses social capital as investment in networks with expected returns, including information.

Within community informatics, treatment of ICTs is largely empirical, rather than conceptual. Hence, studies

largely deal with technologies in the context of particular cases.

### *The Relationship Between Information and Community*

Information as a resource embedded in social networks affects individual or community outcomes. Research has addressed the correlation of acquisition of employment-related information through personal networks with finding a job (e.g., Yakubovich, 2005). Information behavior researchers have also investigated relationships between social capital in personal networks and information acquisition (e.g., Johnson, 2007). More recently, researchers have also begun to investigate the role of community organizations, including libraries, in social capital formation (e.g., Johnson, 2010; Veinot, 2010).

Greater levels of bridging social capital can increase the flow of information in communities, thus having a positive impact on local problem-solving and goal attainment (Putnam, 2000). High levels of bonding social capital in a community may be linked to hostility toward outsiders that can impede community information flow (Putnam, 2000).

### *The Relationship Between Technology and Community*

Drawing from social capital theory, Bertot and colleagues (2008) document the benefits that people derive from free Internet access provided by public libraries, including access to government services and emergency aid. Additionally, Becker and colleagues (2010) show that library patrons use the Internet to develop and maintain social ties, to assist others, and as a pathway to civic participation. Social capital theory is also woven through scholarship on the Blacksburg Electronic Village (BEV; e.g., Cohill & Kavanagh, 1997). Findings affirm that the BEV e-networks foster local social capital. Alkalimat and Williams (2001) reversed the gaze, theorizing social capital as an input to a CTC. Similarly, Ferlander (2003) showed that social capital predicts the success of community technology projects. Borgida et al. (2002) found that social capital may be associated with technology adoption and sustainability.

### *Implications for Future Research*

Social capital theory has stimulated an impressive range of research in community sociology, as well as a growing body of information behavior and informatics research. Clear benefits of this framework include (a) theorizing relationships between communities and information, and (b) offering perspectives and methods appropriate to both face-to-face and online communities. Moreover, the approach offers rigorous methods, such as social network analysis, that permit empirical investigation of community-related concepts.

Johnson (2005) asserts that a key strength of social capital for information behavior research is its ability to assess predictors of information seeking success. Future research could also investigate the role of information and ICTs in

community-level benefits, such as health or civic engagement (Canada Policy Research Initiative, 2005). There is also value in continued investigations regarding the contribution of ICTs to the development of social capital and the role of social capital in technology projects' success.

When working within a social capital framework, information science researchers should keep one limitation in mind. As Field (2003) notes, social capital theory rests on assumptions of rational self-interest, but people have many reasons for connecting with one another besides rational calculation. We recommend that researchers treat self-interest-based explanations of information behavior and technology use as an empirical matter rather than a presupposition. Simultaneously, rival explanations for actors' motivations, such as altruism or professional responsibility, should be considered.

## **Discussion and Conclusion**

Despite widespread interest in community-level information phenomena, research has been hampered by theoretical and methodological challenges. Yet, following calls in the literature (e.g., Talja et al., 2005), research about community-level information behavior and technology use can further illuminate information as a social phenomenon. Research conducted at the community level also holds potential for identifying information-related phenomena that is not apparent at the individual level. Additionally, because certain communities experience collective inequity (Squires & Kubrin, 2005), community-level research may prove particularly helpful in studying marginalized populations, or their more privileged counterparts.

We have pursued an ambitious aim with this article: to enhance the theoretical foundation for research regarding everyday life information behavior and technology use in communities. We have argued that five community sociological paradigms have contemporary relevance for information studies. Thus, we have implicitly asserted that it is valuable for researchers to consider the paradigm that they wish to adopt. Doing so will make our assumptions explicit, while offering conceptual tools for the accumulation and wider application of knowledge. Moreover, grounding research in one of these paradigms offers important opportunities for extending our unit of analysis beyond individuals to the community.

We do not argue that any one paradigm is superior. Rather, we show that each makes a contribution that might be useful for different research problems. Indeed, the paradigms offer robust and varied understandings of community, including systemic, bounded, network, interactional, geographic, power, and interest-based conceptions. Each paradigm also offers definitions and/or empirical treatments of both information and technologies. The literature reviewed here also theorizes relationships between communities and both information and technologies (see Table 1). For example, ICTs and information may play a role in large-scale social processes, such as coordination, integration, differentiation, segregation, and change.

TABLE 1. Summary of sociological paradigms.

	Macro level			Micro level		
	Functionalist paradigm	Evolutionary paradigm	Conflict paradigm	Interactionist paradigm	Exchange paradigm	
Theoretical roots	Durkheim, Parsons, Merton, Luhmann, Alexander	Durkheim, Comte, Spencer, Darwin, "Chicago School"	Marx, Weber, Mills, "Regulation School," Castells	Weber, Mead, Blumer, Kaufman, Wilkinson	Simmel, microeconomics, Coleman, Lin	
Concepts of "community"	<ul style="list-style-type: none"> <li>• Social systems in a territory</li> <li>• Communicative systems</li> </ul>	<ul style="list-style-type: none"> <li>• Territorial population</li> <li>• Community of interest</li> <li>• Information ecology</li> <li>• Information behavior ecology</li> </ul>	<ul style="list-style-type: none"> <li>• An exclusion</li> <li>• Socially stratified places (ghettos and privileged enclaves; cores and peripheries; zones)</li> <li>• Communities of fate</li> <li>• "Growth machine"</li> <li>• Transnational communities</li> <li>• Administratively defined territories</li> </ul>	<ul style="list-style-type: none"> <li>• An interaction</li> <li>• A process</li> <li>• A type of relationship</li> <li>• Interaction bounded by place</li> </ul>	<ul style="list-style-type: none"> <li>• A network</li> <li>• Personal communities</li> <li>• Network in place</li> <li>• Online networks</li> <li>• Administratively defined territories</li> </ul>	
Concepts of "information"	<ul style="list-style-type: none"> <li>• Messages</li> <li>• Communicative complex</li> <li>• A "selection"</li> <li>• Meaning that is new</li> </ul>	<ul style="list-style-type: none"> <li>• Meaning</li> <li>• Physical media</li> <li>• Informing processes</li> <li>• A form of help</li> </ul>	<ul style="list-style-type: none"> <li>• Power</li> <li>• Commodity</li> </ul>	<ul style="list-style-type: none"> <li>• Shared meaning</li> <li>• Informing interactions</li> </ul>	<ul style="list-style-type: none"> <li>• Resource or benefit</li> <li>• A form of social capital</li> <li>• A facilitator of action</li> <li>• Information behavior undertaken for self-interest</li> </ul>	
Concepts of "technology"	<ul style="list-style-type: none"> <li>• Physical media</li> <li>• Information and communications technologies (ICTs)</li> <li>• Institutions that produce and broker information</li> </ul>	<ul style="list-style-type: none"> <li>• Technology as tool</li> <li>• Ecological complex</li> <li>• Socio-technical system</li> <li>• Information, communication, and transportation technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Instruments of power</li> <li>• Congealed social interests</li> <li>• Means of production</li> <li>• Industries</li> </ul>	<ul style="list-style-type: none"> <li>• Social objects</li> </ul>	<ul style="list-style-type: none"> <li>• Community networks/online communities</li> <li>• Community technology centers (CTCs)</li> <li>• Physical infrastructure for Internet</li> <li>• Computer provision and training</li> </ul>	
Relationship between "information" and "community"	<ul style="list-style-type: none"> <li>• Coordinative function of information</li> <li>• ICTs contribute to social differentiation</li> <li>• Social systems define what is informative</li> <li>• Information production and uses vary by community</li> </ul>	<ul style="list-style-type: none"> <li>• Communication promotes social integration</li> <li>• Communication may stimulate social change</li> <li>• Community environments influence selection of information sources</li> </ul>	<ul style="list-style-type: none"> <li>• Informational economy produces social inequality</li> <li>• Community divisions maintained through differential information flows</li> <li>• Representation of communities by ICTs</li> </ul>	<ul style="list-style-type: none"> <li>• Community as a symbol influences the valuing of information and its production</li> <li>• Community memberships affect the social cost of seeking information</li> </ul>	<ul style="list-style-type: none"> <li>• Information affects individual and community outcomes</li> <li>• Social capital affects acquisition of information</li> <li>• "Informing institutions" build social capital</li> </ul>	

		Macro level			Micro level		
		Functionalist paradigm	Evolutionary paradigm	Conflict paradigm	Interactionist paradigm	Exchange paradigm	
Relationship between “technology” and “community”		<ul style="list-style-type: none"> <li>• Contribution of institutionally sponsored ICTs to social goals</li> <li>• Contribution of institutions to ICT design and success</li> </ul>	<ul style="list-style-type: none"> <li>• Technologies promote social integration</li> <li>• Technologies facilitate environmental adaptation</li> <li>• Technologies determine community size and complexity</li> <li>• Technologies stimulate social change</li> </ul>	<ul style="list-style-type: none"> <li>• Differential application of ICTs contributes to social inequality</li> <li>• Community-level digital divides</li> <li>• ICTs help maintain diasporic information environments</li> <li>• ICTs used for community economic development</li> <li>• Spatial availability of ICTs</li> <li>• Information and ICTs may enhance social divisions, or reduce them</li> <li>• Communities may experience unequal access to ICTs and information</li> <li>• ICT projects may reduce or increase inequality</li> <li>• Neighborhoods are represented differentially in geographic technologies</li> <li>• Public library services may meet the demands of the capitalist economy</li> <li>• ICTs may help maintain transnational communities</li> <li>• ICTs may be used to promote community economic development</li> <li>• Communities seek investment from information industries</li> </ul>	<ul style="list-style-type: none"> <li>• Technology use may facilitate formation or maintenance of community identity</li> </ul>	<ul style="list-style-type: none"> <li>• Technology provides additional channels for social capital flow</li> </ul>	
Key findings		<ul style="list-style-type: none"> <li>• Information environments vary</li> <li>• Information production and circulation are often an institutional endeavors</li> <li>• ICT projects may instantiate institutional priorities</li> <li>• Institutional norms may facilitate success of ICTs</li> <li>• Successful government projects rely on local communities</li> <li>• Norms and technological affordances shape virtual communities</li> </ul>	<ul style="list-style-type: none"> <li>• Community characteristics vary alongside the availability of technologies</li> <li>• Communication within communities may exert social control</li> <li>• The availability of information sources in the environment may influence source selection</li> <li>• Diffusion of information and technologies may facilitate social change</li> <li>• ICTs become a part of the socio-spatial environments of communities</li> <li>• ICTs may affect community environments in unanticipated ways</li> </ul>	<ul style="list-style-type: none"> <li>• Interactions with information and ICTs may establish communities and associated identities</li> <li>• Community membership affects the information that people value</li> <li>• People may avoid seeking information if it will pose a social cost to them</li> <li>• Groups may produce information through their interactions</li> <li>• People’s interactions with technology and socio-technical environments merit examination, in addition to people-to-people interactions</li> </ul>	<ul style="list-style-type: none"> <li>• Social networks may affect information acquisition</li> <li>• Social capital both contributes to and results from technology use in communities</li> </ul>		

Although empirical studies of community-level information behavior and technology use are relatively scarce, our review reveals several empirically based insights that are worthy of further confirmation and/or extension. As Table 1 illustrates, macro-level research has shown that information environments vary in important ways, and that the availability of information sources in the environment may influence source selection. Varying information environments may also be associated with systemic information access problems in communities. Information and communication technologies may also become a part of the sociospatial environments of communities, but the uses to which they are put are not predetermined. Studies also suggest that community-level information production, circulation, and technology projects should be understood in an institutional, as well as interpersonal, context. This institutional context may be instantiated in technology initiatives, particularly through norms that may either undermine or facilitate success. Moreover, information behavior and ICTs may have social effects that have been rarely studied in information science, such as social control and change. Information and ICTs may also enhance social divisions, and communities may experience unequal access to ICTs and information. Community technology projects may reduce or increase inequality. Additionally, ICTs may also help maintain transnational communities brought about by globalization. Library services and ICTs may also be tools that facilitate capital accumulation.

Prior research conducted at the micro-level also offers several useful empirical insights (see Table 1). When community is understood as an interaction or a network, we see that information and ICTs can play roles in the production and maintenance of communities and associated social identities. Community membership may also influence the perceived relevance and credibility of information, as well as the social costs of seeking it. Social costs may result in a variety of self-protective strategies, such as information avoidance or selective management of personal networks. Community membership may also facilitate access to information and ICTs. Groups may also produce local forms of information that are specific to their local settings.

Our analysis also suggests additional themes for future research. One critical area is to understand the features of communities that matter for access to information among members, which raises questions about relationships between institutions and information production/circulation. This understanding also leads to questions about factors that affect information acquisition in communities, including the types of informing interactions within them and the influence of social boundaries or exclusion. We also need to investigate relationships between social capital, patterns of information flow and community level outcomes, such as community coordination, segregation, adaptation, or well-being. Moreover, we need to understand how to design information infrastructures to optimally inform community members and reduce social exclusion. In so doing, there is a need to better understand the appropriation of technologies within community environments, particularly by

marginalized communities (e.g., Veinot, Campbell, Kruger, Grodzinski, & Franzen, 2011). Further research is needed to investigate how information and ICTs may contribute to establishing or maintaining socially stratified communities. Additionally, there is a need to investigate the well-being of communities that are differentially incorporated into the information economy. We need to understand the dynamics of community power and how they affect our informing institutions.

Although this article does not specifically address the methodological challenges of community-level research, the literature reviewed here offers some methodological guidance. This is important because information science research is dominated by interview research (Fisher & Julien, 2009)—a method that alone is unlikely to be sufficient for research that takes the community as the unit of analysis. The functionalist paradigm is associated with comparative methods, including case studies and large-scale surveys. Human ecology is associated with mixed methods studies that include ethnography, statistics, and history (Abbott, 1997). The conflict paradigm is associated with comparative case studies, document analysis, and relational network analysis (Domhoff, 2007). Interactionist research is associated with observational methods, often coupled with interviews. Exchange research is associated with social network analytic methods, as well as survey research—increasingly using nested samples that permit simultaneous statistical modeling of individual and contextual factors (e.g., Alder, 2001). Across paradigms, scholars also facilitate community involvement in research through methods such as participatory action research (Day & Schuler, 2004). Each of these methods may be useful depending on the research question at hand.

Community-level information studies research has the potential to transform contemporary information practice. Although public libraries and community networks are mandated to serve specific geographic areas and provide many useful services to community members (e.g., Durrance & Pettigrew, 2002), they are too often understood as services to individuals rather than as interventions at the community level—perhaps because of the theoretical lens that researchers are using. Yet, professional disciplines like public health (e.g., Israel, 1985) and social work (e.g., Popple, 1995) have theoretical bases for community-level practice. Where information practice is undertaken at a community level, services can realize a broader impact than is possible when oriented to serving individuals because intervening at the community level could affect systemic access to information in communities, including people who do not use information services. Accordingly, community-level information practice holds the potential for achieving the greatest good for the greatest number. As Veinot (2010) has argued elsewhere, one valuable approach may be to focus on enhancing information networks within geographic areas. As we have seen with community informatics, studies of technology in local communities are also aided by shifting the focus from technology projects, to the community as a whole.

We recognize that information behavior and technology use in everyday life communities pose challenging research problems. However, our aim here is to make the research area more coherent and conceptually accessible. With the foundation we have provided, we hope that others will be inspired to follow the community thread along with us.

## Acknowledgment

We thank Pam McKenzie for her feedback on early versions of this work.

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