Exploring Context in Information Behavior
Seeker, situation, surroundings, and shared identities

Naresh Agarwal, Simmons School of Library and Information Science

The field of human information behavior runs the gamut of processes from the realization of a need or gap in understanding, to the search for information from one or more sources to fill that gap, to the use of that information to complete a task at hand or to satisfy a curiosity, as well as other behaviors such as avoiding information or finding information serendipitously. Designers of mechanisms, tools and computer-based systems to facilitate this seeking and search process often lack a full knowledge of the context surrounding the search. This context may vary depending on the job or role of the person, individual characteristics such as personality, domain knowledge, age, gender, perception of self, etc., the task at hand, the source and the channel as well as their degree of accessibility and usability, and the relationship that the seeker shares with the source. Yet researchers still do not agree on what context really means. While there have been various research studies incorporating context and biennial conferences on context in information behavior, there lacks a clear definition of what context is, what its boundaries are, and what elements and variables comprise context.

This book looks at the many definitions and theoretical and empirical studies of context, and the author attempts to map the conceptual space of context in information behavior. The book proposes theoretical frameworks for mapping the boundaries, elements and variables of context. It further discusses how to incorporate these frameworks and variables in the design of research studies on context. The author then arrives at a unified definition of context. This book should provide a better understanding of context to designers of search systems as they seek to meet the needs and demands of information seekers. It will be an important resource for researchers in Library and Information Science, especially doctoral students looking for one resource that covers an exhaustive range of the most current literature related to context, the best selection of classics, and a synthesis of these into theoretical frameworks and a unified definition. The book should help to move forward research in the field by clarifying pertinent elements, variables, and views. In particular, the list of elements to be considered, and the variables associated with each element, will be extremely useful to researchers wanting to include the influences of context in their studies.

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Exploring Context in Information Behavior

Seeker, Situation, Surroundings, and Shared Identities
Synthesis Lectures on Information Concepts, Retrieval, and Services

Editor

Gary Marchionini, University of North Carolina, Chapel Hill

Synthesis Lectures on Information Concepts, Retrieval, and Services publishes short books on topics pertaining to information science and applications of technology to information discovery, production, distribution, and management. Potential topics include: data models, indexing theory and algorithms, classification, information architecture, information economics, privacy and identity, scholarly communication, bibliometrics and webometrics, personal information management, human information behavior, digital libraries, archives and preservation, cultural informatics, information retrieval evaluation, data fusion, relevance feedback, recommendation systems, question answering, natural language processing for retrieval, text summarization, multimedia retrieval, multilingual retrieval, and exploratory search.

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Naresh Kumar Agarwal
Simmons School of Library & Information Science

SYNTHESIS LECTURES ON INFORMATION CONCEPTS, RETRIEVAL, AND SERVICES #61
ABSTRACT
The field of human information behavior runs the gamut of processes from the realization of a need or gap in understanding, to the search for information from one or more sources to fill that gap, to the use of that information to complete a task at hand or to satisfy a curiosity, as well as other behaviors such as avoiding information or finding information serendipitously. Designers of mechanisms, tools, and computer-based systems to facilitate this seeking and search process often lack a full knowledge of the context surrounding the search. This context may vary depending on the job or role of the person; individual characteristics such as personality, domain knowledge, age, gender, perception of self, etc.; the task at hand; the source and the channel and their degree of accessibility and usability; and the relationship that the seeker shares with the source. Yet researchers have yet to agree on what context really means. While there have been various research studies incorporating context, and biennial conferences on context in information behavior, there lacks a clear definition of what context is, what its boundaries are, and what elements and variables comprise context.

In this book, we look at the many definitions of and the theoretical and empirical studies on context, and I attempt to map the conceptual space of context in information behavior. I propose theoretical frameworks to map the boundaries, elements, and variables of context. I then discuss how to incorporate these frameworks and variables in the design of research studies on context. We then arrive at a unified definition of context. This book should provide designers of search systems a better understanding of context as they seek to meet the needs and demands of information seekers. It will be an important resource for researchers in Library and Information Science, especially doctoral students looking for one resource that covers an exhaustive range of the most current literature related to context, the best selection of classics, and a synthesis of these into theoretical frameworks and a unified definition. The book should help to move forward research in the field by clarifying the elements, variables, and views that are pertinent. In particular, the list of elements to be considered, and the variables associated with each element will be extremely useful to researchers wanting to include the influences of context in their studies.

KEYWORDS
information behavior, information seeking, context, situation, environment, task, user, source, contextual identity framework
To Sikkim—the land that nurtured me
My family and friends—you are my anchor
And to all those who paved the path for me to walk on
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When I was pursuing my Ph.D. in Information Systems at the National University of Singapore in 2008, I would have frequent meetings with my co-advisor Yunjie (Calvin) Xu. As we worked on designing a research framework for a survey study of knowledge workers in Singapore, he suggested it might be a good idea to review the literature on context. At the time, I didn't know what I was getting into.

When you ask a question to someone, and you don't get an easy “yes” or “no” answer, and the person says, “It depends,” that is when you know that the person is talking about context. In my month-long investigation following the meeting with my co-advisor, I realized that understanding context was not very different from peeling onions. The more I thought I understood, the more I uncovered new layers that provided more questions than answers. Was context something which contains, i.e., the environment that surrounds a seeker of information? Was it the seeker as the person, or the information source that the person looked to for information? Was it the channel of communication that the seeker used to reach the source? Or was it the factors that impacted the choice of the source? Was it the task at hand, or simple everyday curiosity? Was it place and time? Was it situation? Or was it a shared identity or kinship with a team or group one was a part of? As Dervin (1997) wrote, “the very question [of what is context] turns out to be almost embarrassing, and certainly a question leading to a quest that demands extraordinary tolerance of chaos” (p.13).

It took me many months to wrap my head around what context in information behavior might mean. Context has been an important part of the empirical and theoretical studies that I have conducted in the years since then. Whether I am looking at medical residents in a hospital, the interactions of a child with an iPad, the information-seeking behavior of students, the information practices of faculty members, or theoretical and conceptual studies synthesizing different phenomena, an understanding of context plays an important role in the design of those studies.

I developed theoretical frameworks to understand the different aspects of context, what its boundaries and elements are, and how context can be applied in the design of research studies. This book is an endeavor to synthesize and conceptualize the research and understandings of context in the information behavior literature so far, and my own prior research, and to arrive at a definition of context in information behavior. The proposed frameworks should help future researchers as well as search system designers. Now that I’ve shared with you my context for writing this book, we are ready, quoting Dervin (1997), “to demonstrate extraordinary tolerance for chaos, and to talk about context!” 😊

Naresh Agarwal
As I seek to thank people who were by my side as I wrote this book, I think it might be useful to situate these within the contextual factors of task or situation, the surroundings or environment, the information need, the actor or seeker, the source or system, the actor-source relationship, and time/space.

The task or situation was that I was applying for a 6-month sabbatical from the Simmons School of Library and Information Science (SLIS) (the environment). The need then was a worthy project to work on during the sabbatical. I am thankful to Professor Gary Marchionini and the reviewers for approving my proposal. My heartfelt thanks to my wonderful Dean Eileen Abels, the review committee and the Provost for approving my sabbatical, which enabled me to work on this project. I’m grateful for the support of all my colleagues at SLIS.

I was the actor or seeker in need of information through the process of synthesizing and writing. The various information sources were the proceedings of the information seeking in context conferences, information behavior books, and primarily, my own prior research on context since my Ph.D. days at the National University of Singapore. I’m grateful to my graduate student assistant, Alison Fisher, who worked closely with me in helping gather literature, making suggestions and meeting with me online as I worked on the book. My familiarity with the sources and the literature (actor-source relationship) was very useful in putting the book together.

The time was the November 2016–August 2017 period when I worked on the book, as well as later period of reviews and revisions (September–October, 2017) until publication. I’m grateful to Diane Cerra for being so supportive throughout and helping secure the approval for letting me design my own self-painted cover. My sincere thanks to the reviewers Professors Sanda Erdelez and Barbara Wildemuth for their very thorough review and comments. I believe that addressing all their comments greatly helped to improve the book. The place where I worked was my home office in Sharon, Massachusetts, typing away on my Windows laptop. I’m eternally grateful for the unconditional love and support of my wife Dr. Archana Agarwal and the joy of my two kids—9-year old Eesha and 2 ½-year old Ishaan.

I’m thankful to my family in India who have been with me throughout. Last, but not the least, I’m indebted to my friends (‘sāthī’ in Nepali or Hindi, or “priya snehitah” or “mitraṃ” in Sanskrit), who have always been there for me—whether in person, over the phone, or through social media.

Naresh Agarwal
October 14, 2017
Imagine that you are a typical information seeker (if there is such a person), and that you have just encountered a need for information. It could be in an everyday life situation at home—like booking an air ticket, buying new shoes, or deciding on a college—or at a work or study task, like working on a project or assignment. You will likely then choose to start looking for information to fulfill your need. Your search for information may be from people—friends or colleagues or a reference librarian (either face-to-face, using asynchronous communication such as email, or synchronous communication such as phone or instant messaging), from physical books or manuals, or from online websites and search interfaces such as Google or Wikipedia (Agarwal, 2011; Agarwal, Xu, and Poo, 2011). You may go online first (Agarwal, Xu, and Poo, 2011) (on a smartphone or computer), using an app or a browser, to a search engine such as Google or a site such as Wikipedia, social media such as Facebook or Twitter, or ask Siri, Cortana, or Alexa. You might decide to email or to text a friend or colleague using SMS, iMessage, WhatsApp, Facebook Messenger, SnapChat, Allo, etc. so as to reach out without completely interrupting what your friend or colleague (the source) might be doing at the moment. You might call this source using your phone, on WhatsApp, Messenger, Skype, or Facetime Audio, or speak to the person over video—using Facetime, Google Hangout, Skype, or GoToMeeting. Finally, and increasingly often as a last resort (sometimes even when the person is within geographical proximity or in the same room—see the discussion at CollegeNet, 2015), you might reach out to the person face-to-face. You might even decide to seek information collaboratively as a pair with a teammate, as a team or a group, or reach out to a community of people for answers—on Facebook, Twitter, or other online communities like blogs, Quora.com, Yahoo Answers, etc. As you can see, your choice of action, and the source or channel to use will be based on specific contextual factors.

In order for a reference librarian or a search engine to adequately understand and help an information seeker, it would be helpful to understand the context/situation of the information need that got the person searching in the first place (except in cases where both the question and answer are factual and relatively straightforward). A depersonalized search engine doesn’t always get the right results; for example, a search for “apple” on Google may give results related to the Apple computer and other products by the company. Yet it might be that the person searching is a farmer or someone looking for apple picking. While this could be resolved by incorporating some of the context in the query formulation, there are other aspects of a person’s context, like expertise and stage of the project at hand, that may be difficult to include in a query. This simple example of the search for apple describes linguistic ambiguity. In real-life situations and work-based tasks
such as planning travel, buying something, adopting a pet, working on a team project, or conducting research, which are often more complex, it would help if the search engine knew more about the person’s task or situation. This knowledge about the task, situation, person, etc. is something that can be described as the knowledge about the person’s context when looking for information. As Fatemi (2015) posits, “the Internet will soon be about context and discovery, increasing its focus on serving up content consumers don’t know they need yet.”

“Context is the quark of communication theory; everyone knows it is there, but nobody is sure where—or what—it is. In the last thirty years or so, virtually everyone writing about communication theory ‘discovers’ that what is really needed is a theory of context” (Keith, 1994, p. 229). This notion of context has received increased attention in information science conferences and publications over the last two decades, along with related terms such as situation, setting, and environment. Numerous authors have argued for information retrieval research to incorporate more context (Cool, 2001; Järvelin and Ingwersen, 2004; Ingwersen and Järvelin, 2005; Beaulieu, 2006; Ruthven, 2008; Fidel, 2012). As Dervin wrote (1997), “The good news is that context is hot. Everywhere one turns in literatures of the social sciences and humanities focusing on how humans make sense of their worlds one sees increasing references to context” (p. 13). Cool (2001) attributed this increased attention to the thinking that “in order to better understand information-seeking behavior and information retrieval interaction, greater attention needs to be directed to the information spaces within which these activities are embedded” (p. 5). The purpose of the first Information Interaction in Context (IIiX) conference in 2006 was “to investigate how the concept of context can be understood and exploited to make information systems truly interactive” (Ruthven et al., 2006, p. i). Context continues to be “hot” 20 years later, with the term becoming increasingly important in fields such as information science, information retrieval, information interaction and human-computer interaction (Fidel, 2012). Conferences such as Information Seeking in Context (ISIC) and IIiX have continually discussed it. In 2016, the first CHIIR (ACM SIGIR Conference on Human Information Interaction and Retrieval) conference was held, representing the merger of IIiX and the Human Computer Information Retrieval symposium (HCIR).

Lee (2011) writes that context is inherently relational: it is always context of, about, or surrounding something or someone. Lee also cites a number of past definitions and descriptions of context. As the title of this book suggests, we are interested in the context of, about or surrounding the actor engaged in information behavior. Before we start looking in-depth at context, we will briefly summarize the field of information behavior research as a whole and discuss the importance of context within it.
1.1 THE FIELD OF INFORMATION BEHAVIOR

Information behavior is a field of research encompassing a wide range of essential human activities, including “accidental encountering of, needing, finding, choosing, using, and sometimes even avoiding, information” (Case and Given, 2016, p. 4). It is concerned with information use and nonuse, the processing of found information, and reasons for unsuccessful processing (Ford, 2015). Several key concepts and sub-areas within information behavior are defined in Table 1.1 below. The definitions for actor, information need, and information seeking are adapted from Agarwal (2015).

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actor</td>
<td>Seeker/user/person who is looking for information or who finds information unexpectedly. According to Dervin's sense-making methodology, this actor is a “body-mind-heart-spirit moving through time and space, with a past history, present reality and future dreams or ambitions” (Foreman-Wernet, 2003, p. 7; Agarwal, 2012).</td>
</tr>
<tr>
<td>Information Need</td>
<td>The recognition that your knowledge is inadequate to satisfy a goal (Case and Given, 2016). Line (1974) distinguishes need from other related terms such as want, demand, and requirement (also see Agarwal, 2015). Taylor (1968) defines information need as one of four types: visceral, conscious, formalized, and compromised, depending upon the degree of clarity and articulation of the need. Wilson (1981, p. 8) suggests avoiding the term information need and instead referring to “information-seeking toward the satisfaction of needs.” Savolainen (2012) examined the various ways of studying the triggers for information need, and deduced that there were three different ways that people understood information need to happen—as part of a situation, as arising in a work task, or happening during a discourse or part of a conversation. These contexts for need are not mutually exclusive and could co-occur.</td>
</tr>
<tr>
<td>Information Seeking</td>
<td>A conscious effort to acquire information in response to a gap in our knowledge (Case and Given, 2016). Bates (2002) characterizes information seeking as either active or passive and either directed or undirected.</td>
</tr>
<tr>
<td>Information Searching</td>
<td>“A subset of information seeking, particularly concerned with the interactions between information user…and computer-based information systems” (Wilson, 1999, p. 263). An information retrieval system leads the user to documents that help satisfy information need (Robertson, 1981) or solve problems (Belkin, 1984).</td>
</tr>
<tr>
<td>Information Use</td>
<td>“What information does to or for the recipient and for his or her problem or situation” (Taylor, 1991, p. 221). Wilson (2000, p. 50) defined information use as “the physical and mental acts involved in incorporating the information found into the person’s existing information base.” “It may involve…physical acts such as marking sections in a text…[or] mental acts.[such as comparing]…new information with existing knowledge” (Wilson, 2000, p. 50). Savolainen (2009) drew from approaches in organization science (the notions of <em>epistemic work</em> suggested by Cook and Brown (1999) and <em>knowing in practice</em> proposed by Orlikowski (2002)) to conceptualize information use as a process that is contextualized in action or practice. Epistemic work conceptualizes information use as the employment of tacit and explicit knowledge in the service of knowing, where knowing is understood as an inherent part of action. Knowing in practice sees information use as construction and reconstruction of knowledgeability in and through action (Savolainen, 2009). Specific examples of reading and learning as information use include Renear and Palmer (2009), Zhang et al., (2011), Latham (2014), and Vakkari (2016).</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Information Encountering/Serendipity</td>
<td>In Agarwal (2015), I define serendipity in information behavior as “an incident-based, unexpected discovery of information leading to an <em>aha!</em> moment when a naturally alert actor is in a passive, non-purposive state or in an active, purposive state, followed by a period of incubation leading to insight and value.” At the panel <em>Research Perspectives on Serendipity and Information Encountering</em> at the ASIS&amp;T 2016 Annual Meeting, there was a suggestion to build consensus on using the term <em>information encountering</em> to denote serendipity in information behavior (Erdelez et al., 2016). Also see Erdelez’ (1997) conceptualization of encountering and Makri and Blandford’s work on serendipity (Makri and Blandford, 2012; Makri et al., 2014).</td>
</tr>
</tbody>
</table>
Early research on information seeking was chiefly system-centered (Vakkari, 1999), focusing on information sources, library use, and the performance of retrieval systems (Case and Given, 2016). In the 1970s, the focus of research in information science moved away from information systems toward the person as a searcher, creator, and user of information (Ellis, 2011). This user-centered paradigm has sought to understand both the commonalities and the differences in the ways people interact with information in the world around them.

Pettigrew, Fidel, and Bruce (2001) classify major conceptual developments in the user-centered information behavior literature into three categories: cognitive, social and multifaceted. Cognitive approaches cover models and theories focusing fundamentally on individual user attributes and knowledge structures (Belkin, 1990). Social approaches focus on the way an individual's interaction with information is shaped by social norms, networks, and organizations (Talja, Tuominen, and Savolainen, 2005). The area of “information practice” (Savolainen, 2007, 2008), as distinct from information behavior follows this social approach. We will discuss information practices briefly in Section 2.2.3, under the sub-section “Other information behavior and practices affected by context.” Multifaceted approaches cover the cognitive, social, and organizational context (see Ingwersen and Järvelin, 2005).

The cognitive viewpoint has been the dominant approach in most user-centered models (Wilson, 1981; Krikelas, 1983; Ellis, 1989; Kuhlthau, 1991; etc.) and some system-centered models (e.g., Belkin, 1990; Ingwersen, 1992; Saracevic, 1996; Spink, 1997; Järvelin and Ingwersen, 2004; Ingwersen and Järvelin, 2005; Järvelin, 2007). More naturalistic and interpretive studies (e.g., Chatman, 1996; Solomon, 1999; McKenzie, 2003) have used social approaches. These are less common in empirical work than the cognitive viewpoint. Apart from the cognitive and social approaches, there are affective approaches that study the role of emotion in information behavior (Kuhlthau, 1991; Nahl and Bilal, 2007; Savolainen, 2014). Dervin (Dervin, 1992; Dervin and Foreman-Wernet, 2012; Agarwal, 2012), Leckie et al. (1996), Johnson (1997), Kari and Savolainen (2003), Byström and Hansen (2005), Karunakaran, Reddy, and Spence (2013), and others have proposed multifaceted models that bring together both cognitive and social approaches. These multifaceted...
approaches emphasize the importance of social, organizational, and situational factors on an individual’s cognitive state.

1.1.1 WHY IS CONTEXT RELEVANT TO INFORMATION BEHAVIOR?

If we did not take context into consideration, then it would be reasonable to assume that information behavior follows a predictable pattern, i.e., people look for information in a certain way all the time (for example, perhaps they always choose information sources based on their quality or accessibility). The danger of such assumptions is that they paint everyone and every behavior with a broad brush, without investigating the nuances of the conditions under which these behaviors might differ. People don’t behave the same way all the time. Every situation is unique, involving different people, different surroundings, and a different series of events. Our behavior is affected by factors outside our control. That is why context becomes important.

As Jansen and Rieh (2010) wrote, “information is difficult, if not impossible, to define separately from a given context” (p. 1522). Context is a key part of any study of any aspect of information behavior—be it information seeking, information encountering, information avoiding, information use, collaborative information seeking, mobile information behavior, etc. Each of these will vary according to the actor and his/her social context, the source or system, the workplace or everyday life, and the relationships and the interactions between these. Identifying and understanding those factors then becomes a primary imperative in investigating research questions in any of these areas of information behavior.

While earlier system-centered research investigated the contextual variables of users in certain contexts, later user-centered research focused first on the person, regardless of context (Fidel, 2012). In the first ISIC conference in 1996, the notion of “in-context” research was formally established (Fidel, 2012), with researchers such as Wilson (1997) incorporating the “person-in-context” into their information seeking models. Other early models emphasizing context include Byström and Järvelin (1995) and Savolainen (1995).

In the last few decades, “context-awareness” or “context-aware computing” has become increasingly important in the design of software systems. Context-awareness is defined as “the use of context to provide task-relevant information and/or services to the user” (Dey and Abowd, 1999, p. 1). Traxler (2011) mentions the shifting role of context in the mobile-connected world, where the actor is driving system design for personal mobile digital technologies (as the person could carry the mobile anywhere), as opposed to an organization, school or library where the actor might have earlier gone to use computers. “We now cross from a technical or reformist account of context to a radical or social account and a shift of context-aware mobile learning from a component of mobile learning to the educational component of context-aware services and experiences” (Traxler, 2011, p. 6). This has implications for mobile learning, for the relationship between learners and their edu-
1.2 WHAT IS CONTEXT?

“To ask a question [what is context?] that is so little asked may prove useful…after an extended effort to review treatments of context, the only possible conclusion is that there is no term that is more often used, less often defined, and when defined defined so variously as context” (Dervin, 1997, pp. 13-14). While researchers have made various attempts to define context—resulting in terms such as environment, container, situation, etc.—there isn’t a single accepted definition of context as yet. Most literature in the field fails to address the problem of context theoretically (Dervin, 1997; Johnson, 2003; Lueg, 2002; Courtright, 2007; Agarwal, Xu, and Poo, 2009).

An inherent problem with defining context is that it is emergent, continually renegotiated and defined in the course of action (Kuutti, 1999; Dourish, 2004; Allen, Karanasios, and Slavova, 2011). “‘Context’ is a slippery notion. Perhaps appropriately, it is a concept that keeps to the periphery, and slips away when one attempts to define it” (Dourish, 2004, p. 29).

Dervin (1997, pp. 14-15) lists three conceptualizations of context in the literature. She argues that for many, “context has the potential of being virtually anything that is not defined as the phenomenon of interest…a kind of container in which the phenomenon resides." Similarly, Lee (2011) describes “everything else” as the broadest formulation of context, i.e., everything in the universe that is not the actor. Dervin says that a second group struggles with trying to determine which of an “inexhaustible list of factors” will be included in context. For a third group of researchers, context is “the carrier of meaning…an inextricable surround without which any possible understanding of human behavior becomes impossible”.

Lee (2011, p. 97) classifies the literature and formulations on context as one of three types—Context1, Context2, and Context3. Context1 is the set of symbolic expressions or representations that surround the actor and helps one to express, make sense of, translate or otherwise act upon or within the actor. This relates to the idea of “where I stand” (Lee, 2011) or situatedness (Lindblom and Ziemke, 2003) of the actor within an environment where the actor’s thinking and behavior is informed and dictated by the environment. Context2 is the objective or socially constructed characteristics and conditions of the situation in which the actor is, appears or occurs. Examples include: location; temperature; being under water; position within the reporting structure of an organizational hierarchy; existence and accessibility of other surrounding people or objects (Lee, 2011). Lee describes Context3 as aspects of the mental or physical state, disposition, intentions, identity, habits
or recent experiences of the actor that bear upon how the actor interprets, understands, acts within, or what the actor notices of, the situation at hand. Context_3 can take the form of the actor’s own state/disposition or the state/disposition of other people that are relevant to the task/matter at hand (e.g., co-workers in a team, or collaborators).

We can understand Context_1 as the environment, Context_2 as the situation at a particular time and space, and Context_3 as the actor’s personal and social characteristics. Lee writes that a great deal of human communication takes place at the intersection between these three types of context. In the section below, we discuss the many definitions and types of context. I arrive at my own unified definition in Chapter 5.

1.2.1 THE MANY FACETS AND TYPES OF CONTEXT

Researchers have used many terms to describe context or its facets, some of them similar in meaning, but not always equivalent. This points to their differing perceptions of context. The source of this disagreement is no doubt the vast complexity of the topic; individual studies have focused on such a variety of contextual factors—e.g., the actor, the work role or life role, the situation, the source or system, and interactions among these—that it is very difficult to arrive at a definition that adequately accounts for all such factors.

Dourish (2004) makes a distinction between the objective/positivist and subjective/phenomenological view. “Positivist theories seek objective, independent descriptions of social phenomena, abstracting from the detail of particular occasions or settings, often in favor of broad statistical trends and idealised models.” (Dourish, 2004, p. 20). “Phenomenological theories are subjective and qualitative in orientation”; “social facts are emergent properties of interactions, not pre-given or absolute but negotiated, contested, and subject to continual processes of interpretation and re-interpretation”; “…abstract categories… are things that need to be imposed on the world through our interactions with it and with each other, rather than things that exist within it” (Dourish, 2004, p. 21). These views held by researchers also influence the way they understand and categorize context. Researchers might identity themselves more with a “positivist” orientation using scientific, quantitative reasoning and approaches in their research methods, or more with an “interpretivist” orientation using humanistic, qualitative approaches in their research. They might also adopt other stances such as “critical,” or straddle across these different orientations and approaches using mixed-methods.

We discuss the sometimes-competing terms below. I arrived at these various types through a review of the literature on context, and my own prior work in the area. The initial categories such as context as environment, setting, etc., were especially informed by Courtright (2007), Agarwal (2009a), and Agarwal, Xu, and Poo (2009). The list grew as more literature was reviewed, and various ways of labeling and categorizing context were identified.
1.2 WHAT IS CONTEXT?

a. Context as Environment or Container

In many studies of a person's information seeking or information retrieval behavior, context has been understood as an environment or container surrounding the person (for example, Rieh, 2004; Lamb, King, and Kling, 2003)—aspects of a person’s life or work role that would influence why a person is looking for information, and the degree to which he/she/they would be satisfied with a particular answer. Other research that sees context as environment includes, for example, Janes and Silverstein (2003) and Taylor (1991). Lee (2011) defines context as a “set of things, factors, elements and attributes that are related to a target entity in important ways (e.g., operationally, semantically, conceptually or pragmatically) but are not so closely related to the target entity that they are considered to be exclusively part of the target entity itself” (p. 96). Context as environment would fall under Dourish’s (2004) description of the positivist view of context; see Figure 1.1.

![Figure 1.1: Context as environment or container.](image)

b. Context as Setting

This is similar to the environment/container viewpoint. Research using this term includes, for example, Byström (1997), Pettigrew (2000), Davies and McKenzie (2004), McKenzie (2004) and Brown (2010). Allen and Kim (2000) view contexts as the socially defined settings in which information users are found, e.g., a work setting such as an office or a factory. Most studies in libraries, archives, and museums treat context as a setting, where different aspects of user needs and behavior are studied. Here, the setting is typically described as a type of library (public libraries, academic libraries, special libraries like corporate, medical, law, church, or prison libraries, etc.), and particular archives or museums. Several journals in Library and Information Science demonstrate this emphasis on context as setting. Examples include the Journal of Academic Librarianship, Journal of the Medical Library Association, Journal of Business and Finance Librarianship, Law Library Journal, Science and Technology Libraries, Archival Science, etc. Context as setting would also fall under Dourish’s (2004) positivist view of context.
1. INTRODUCTION: WHY CONTEXT?

Figure 1.2: Context as setting.

c. Context as Role

Other research subsumes specific aspects of the environment, surrounding, container, setting with aspects of the actor to focus on the service or work role as context. This is evidenced by journals dedicated to specific work within settings. For example, in a library setting, this work role context is seen in the journal titles Reference and User Services Quarterly, Reference Librarian, Music Reference Services Quarterly, Collection Management, Technical Services Quarterly, Library Collections, Acquisition and Technical Services, and more general types of work in journals such as Information Processing and Management. Context is also studied for other work roles, such as doctors (Gorman, 1999; Grad et al., 2011), lawyers (Sutton, 1994; Cole and Kuhlthau, 2000), managers (Choo and Auster, 1993; Edwards et al., 2013), etc. Studies have also looked at everyday life roles of the actor, such as citizen or voter, consumer, hobbyist, gatekeeper, patient, student, and so on (Abrahamson et al., 2008; Case, 2010; Cole, 2013; Yates and Partridge, 2015, among many others). Leckie and Pettigrew (1997) discuss information behavior in light of role theory, which originated in psychology and sociology.

Figure 1.3: Context as role (physician, graduate, and cyclist).
d. Context as Situation

A situation is “a set of related activities, or a set of related stories, that occur over time” (Sonnenwald, 1999, p. 180). People have used the term situation interchangeably with context (e.g., Allen, 1997), but some researchers have sought to disambiguate the two. Sonnenwald (1999) states that context is larger than a situation and may consist of a variety of situations. “Different contexts may have different possible types of situations” (p. 180). Cool (2001) extends Sonnenwald’s notion to suggest that “contexts are frameworks of meaning, and situations are the dynamic environments within which interpretive processes unfold, become ratified, change, and solidify” (p. 8). Likewise, for Allen and Kim (2000), “within each of these broad contexts, different situations occur…individuals may be situated in different ways in the context” (p. 1). McCreadie and Rice (1999, p. 58) define context as the “larger picture in which the potential user operates; the larger picture in which the information system is developed and operates, and potential information exists,” and situation as “the particular set of circumstances from which a need for information arises.” Courtright (2007) sees context as including those elements that have a more lasting and predictable influence on information [behavior] than situation (closer to life world and information world, discussed below), whereas situation is seen as a potential part of context. A situation can also be considered something that “happens” to people, where actors deal with things not because they want to, but because they have to. German philosopher Martin Heidegger describes this as “thrownness” (Dahlstrom, 2013). “The thrower of the project is thrown in his own throw. How can we account for this freedom? We cannot. It is simply a fact, not caused or grounded, but the condition of all causation and grounding” (Inwood, 1999). A close parallel is the idea of situatedness, where the actor’s behavior and cognitive processes are believed primarily to be the outcome of a close coupling between the actor and the environment (Lindblom and Ziemke, 2003).

e. Context as the Actor’s Mind

Some researchers see context as arising in the mind of the actor. Here, context becomes internal, and includes cognitive-affective factors. Wilson (1999) talks about the actor’s experience of cognitive dissonance affecting information need (pp. 256–257). Lee (2011) describes it as one of three formulations of context in the literature—“aspects of the mental or physical state, disposition, intentions, identity or recent experiences of an actor that bear upon how she interprets, understands, acts within, or what she notices of, the situation at hand” (p. 97). This would fall under Dervin (1997)’s description of context, and Dourish (2004)’s characterization of the phenomenological approach to understanding context.
f. Context as Information Horizon, Field, and Pathways

“Within a context and situation is an ‘information horizon’ in which we can act” (Sonnenwald, 1999, p. 184). Sonnenwald describes an information horizon as consisting of a variety of information resources such as social networks, documents, information retrieval tools, and experimentation and observation in the world (1999, p. 185). It can be thought of as sources and channels available to an actor when looking for information. In Agarwal (2011) and Agarwal, Xu, and Poo (2011), I list five types of sources or channels available to an actor engaged in information seeking—face-to-face, phone/chat, email/forum, book/manual, and online. These consist of a combination of synchronous (face-to-face, phone/chat) and asynchronous sources (email/forum), and human (face-to-face, phone/chat, email/forum) and non-human sources (book/manual, online). It is debatable whether information horizon is context, or shaped by the actor’s context that gives rise to the information need. In the former case, the sources and channels available to the actor might inform the need for information at a given point in time. In the latter, the actor’s context (e.g., at work or in everyday life) gives rise to a need for information, which prompts the actor to look for information from one or more sources i.e., reach out within one’s information horizon.

Johnson et al. (2006) use the terms fields and pathways, where they define field as the typical arrangement of information stimuli to which the actor is regularly exposed, and the information
resources the actor routinely uses (Sonnenwald, 1999; Agarwal Xu, and Poo, 2011). They write that actors are “embedded in a field that acts on them,” but that “they also make choices about the nature of their fields, the types of media they attend to, the friendships they form and the neighborhoods they live in…based on their information needs and preferences” (Johnson et al., 2006, p. 571). Johnson et al. define a pathway as the route someone follows in the pursuit of answers to questions—an information matrix formed by a variety of channels, a variety of sources within channels, and a variety of messages contained within these sources. As opposed to an actor’s field, Johnson et al. see pathways as “more dynamic and active, focusing on individual actions over-time in response sequences…This movement over-time may result in changing contexts that are the direct result of individual choice and a response to what an individual has uncovered” (p. 572). Thus, while a field is more stable, a pathway depends on what the actor finds and how the actor reacts to this information (Johnson et al., 2006).

g. Context as Constraints

The term constraints describes “a host of factors external to the [information seeking] behavior itself” that influence the selection of strategies that people employ to find information. In his “person-as-situation” model, Allen (1997) identifies individual differences and situational factors as acting concurrently to constrain individual or group behavior. “An individual might be able to behave in a certain manner, but will be constrained by the realities of the situation to avoid such behavior. Similarly, a situation might permit several courses of action, but a specific individual might lack the knowledge or abilities necessary to complete one of more of those possible courses of action” (Allen, 1997, p. 119). A group would similarly be constrained by organizational and social values, as well as group dynamics, and their collective knowledge and abilities when faced with certain situations.

In the systems approach terminology, constraints affect information behavior, but cannot be changed by it (Churchman, 1979). However, from a person-centric point of view, the actor is also able to influence context. This is supported by Ingwersen and Järvelin (2005): “actors and other components function as context to one another in the interaction processes” (p. 19). Fidel and Pejtersen’s (2004) dimensions of cognitive work analysis (work environment/domain, organization, activity/task, actor’s characteristics, resources and values, etc.) each create a constraint for the dimensions nested below them. Brézillon describes context as “what constrains problem solving without intervening in it explicitly” (Brézillon, 1999, p. 48).

h. Context as Life-world/Information World

Chatman (1996), Talja (1997), Lievrouw (2001), and Kari and Savolainen (2003) investigate the role of the actor’s life world and information world in shaping the actor’s information needs and behavior. “The person’s life-world imports the perceived reality in which his/her/their activities take
place...some salient attributes of the ordinary life-world are the actor’s perceived demographics, personality, way of life, world-view, values and purpose in life” (Kari and Savolainen, 2003, p. 159). Kari and Savolainen also say that humans have the capacity to change their worlds. I would posit that whether certain information sources are a part of an actor’s information horizon (Sonnenwald, 1999) or not would also be shaped by the actor’s life world.

i. Context as Common Ground and Ordinariness

Common ground is “the information, knowledge and beliefs, which a group (of two or more) have in common and their awareness that the group has this information and knowledge in common” (Sonnenwald, 2006)—in other words, it forms part of the social context. Clark (1996) describes common ground as an important element in human communication and people’s use of language, where he describes using language as “dancing a waltz, playing a piano duet or making love, in that they are all kinds of joint action” (Carston, 1999, p. 167). The goal of language use is to increase common ground. Common ground is considered context, especially as it relates to information seeking by an actor from a human source, and the sharing of knowledge by the source with the actor. As Sonnenwald (2006) writes, the “goal of information sharing is to change a person's image of the world and to develop a shared working understanding. It is an essential component of collaboration” (abstract). The degree to which a conversation is successful can be measured by the degree to which the parties to the conversation share a common ground, i.e., how much they understand each other. Common ground is something we often assume as given, in our social interactions, but is also something we intuitively work at—through verbal and non-verbal language—through smiles, text messaging, emoticons, acknowledging, emotionally reaching out, etc. Common ground can relate to ordinariness described by Dourish (2004), and first proposed by Harvey Sacks (1984) in his paper “On Doing ‘Being Ordinary’”, where he analyzed conversations to uncover the unnoticed mechanisms by which people would manage the conversation as it proceeded. Being ordinary is an accomplishment and something that people work at (Dourish, 2004). Dourish describes ordinariness as “something that we do; rather than simply being a stable feature of the world, it is actively managed and achieved in the course of interaction”; “this is a mutual achievement; ordinariness must be both produced and recognized by the parties to an interaction.”; “it is relative to particular communities and activities; it is a feature of forms of competent language use for groups of language users” (p. 24). Ordinariness (and common ground) relates to context because, “like ordinariness, context is managed moment by moment, achieved by those carrying out some activity together, and relative to that activity and to the forms of action and engagement that it entails” (p. 25).
j. Context as Discourse

In the social constructionist viewpoint, unlike the cognitive viewpoint, one’s entire understanding of the world and way of thinking is based on interaction with other people. I would posit that discourse is usually verbal, while interaction is a broader set of possibilities that include verbal interchanges. Here, discourses set “the boundaries of social knowledge” and act as “repositories of starting points, definitions, and themes that position speakers as they give meanings to phenomena” (Talja, Tuominen, and Savolainen, 2005, p. 89). Thus, the actor’s social interaction and discourse helps shape large parts of the actor’s information behavior. Savolainen (2012) investigated the contexts in which information need is triggered. One of the three ways in which he describes need is triggered is through dialogue. Context as discourse also relates to the ordinariness of everyday conversation studied by Sacks (1984).

Figure 1.6: Context as discourse.

k. Context as Information Ground

Information ground relates to the idea of context as place or social setting (Fisher, Landry, and Naumer, 2006). Writing as Pettigrew (1999), Fisher applied Tuominen and Savolainen’s (1997) social constructionist approach and proposed information grounds to describe social settings in which people share everyday information while attending to a focal activity (see Fisher, Durrance, and Hinton, 2004; Fisher et al., 2005; Fisher, Landry, and Naumer, 2006). This grew from her study of everyday information sharing among nurses and the elderly at community foot clinics in Canada. Pettigrew (1999) defined information grounds as synergistic “environment[s] temporarily created when people come together for a singular purpose but from whose behaviour emerges a social atmosphere that fosters the spontaneous and serendipitous sharing of information” (p. 811). According to some of her propositions that she tested empirically (Fisher, Landry, and Naumer, 2006): people gather at “information grounds” for a primary, instrumental purpose other than information sharing; social interaction is a primary activity at “information grounds” such that information flow is a by-product; information grounds can occur anywhere, in any type of temporal setting and are predicated on the
presence of individuals; people use information obtained at “information grounds” in alternative ways, and benefit along physical, social, affective and cognitive dimensions; many sub-contexts exist within an “information ground” and are based on people’s perspectives and physical factors; together these sub-contexts form a grand context (Fisher, Durrance, and Hinton, 2004).

I. Context as Assigned Meanings During Interaction

Dourish (2004) recommends turning our attention away from context as a set of descriptive features of settings to practice as forms of engagement with those settings. He writes that, by doing so, we assign a central role to the meanings that people find in the world, and the meanings of their actions for themselves and for others. These meanings are open-ended; part of what people are doing when they adopt and adapt technologies, incorporating them into their own work, is creating and communicating new meanings though those technologies as their working practices evolve. Thus, users, and not designers, determine the meaning of the technologies that they use, through the ways in which they incorporate them into practice (Dourish, 2004, p. 28). Traxler’s (2011) summary of Dourish (2004)'s viewpoint is quite apt. Rather than viewing context as information, Dourish defines context as “a relational property” between the actor and other objects or activities, and thus signifies relevance; rather than delineated and defined in advance, context is defined dynamically; rather than stable, context is local to each occasion of activity or action; rather than context and content [or the actor] being two separable entities, “context arises from the activity” or task. Context isn’t just “there”, but is actively produced, maintained, and enacted in the course of the activity at hand (Dourish, 2004, p. 22; Traxler, 2011). Cook (2010) also mentions the notion of ‘user-generated context’, which emphasizes the role of the actor and learner in shaping their own context, and erodes the distinction between the actor and the environment (Traxler, 2011). With respect to smartphone use, Natarajan, Shin, and Dhillon (2013) write that the application the actor will launch next intuitively depends on the sequence of apps used recently in the current context. They describe the sequence of clicks made in the current session as interactional context.

Figure 1.7: Context as assigned meanings during interaction.
m. Context as Proximity and Relevance

Something is generally more likely to be considered part of context if it is proximate to the actor along a particular dimension or for a particular purpose (Guha and Lenat, 1994). Proximity can also relate to time and history. Lee (2011) writes that there is a rough correlation between something being part of the context and its relative recency (proximity in time to the actor). Context can be proximity and relevance, and be “difference and change; it can be seen as a description of that which differentiates, what is different in what is near or recent and what is further or earlier in relation to the subject” (Traxler, 2011, p. 4).

n. Context as Time and Place/Embodiment and Portability

Apart from the idea of working on a task in a specific room in a workplace, or studying for exams in a room, you can also shift context as you read a book in the library, walk out of the library while reading, and continue reading as you board the bus home. Here, the book is portable, and the surrounding environment and people where the actor is embodied is shifting as the actor moves from place to place, while still engaging in the task of reading. This is more apparent now as more and more people carry smartphones, and are seen walking about with their heads focused down on their phones. “Whereas [an actor working on] the desktop computer imposes quite a rigid and separate set of contexts on a user or learner—they are either learning or they are doing something else equally specific –, mobiles produce or enforce a more fragmentary and transient movement between multiple user-contexts.” “Real and virtual spaces and the contexts that they represent become interwoven … the user works now in overlapping and fragmentary contexts, where other roles or contexts can easily intrude. Users are no longer dedicated learners nor are there stable contexts” (Traxler, 2011, p. 6). Research on mobile devices tends to focus on this conceptualization of context as time and place because it is easy to automatically capture time and place with mobile devices.

Figure 1.8: Context as portability.

With the increasing usage of social media, context collapse (when disparate social networks overlap) has emerged as an important topic (Davis and Jurgenson, 2014; Litt and Hargittai, 2016).
This collapsing of context blurs the public and private, professional and personal, and the many different selves and situation in which individuals find themselves, leading to potentially beneficial as well as problematic consequences (Davis and Jurgenson, 2014). Nissenbaum (2010) proposes the concept of contextual integrity as a privacy framework that avoids dichotomies of public and private, and rests instead upon the appropriate practices for collection and dissemination of information rooted in the particular norms governing any given arena. Applying Nissenbaum’s framework, Davis and Jurgenson (2014) argue that context collapse happens under varying conditions, depending on the degree of intentionality—when actors collapse contexts on purpose, and when contexts collapse by default or by surprise. They call the first collisions, and the second collisions. Davis and Jurgenson (2014, p. 480) define context collusions as “the purposeful, intentional, bringing together of various contexts and their related networks,” like inviting close friends, distant relatives and more to a wedding. Through a two-month-long diary study of 119 diverse American adults and their 1,200 social network site posts, followed by 30 interviews, Litt and Hargittai (2016) explore the imagined audience on social network sites (the people constituted under “collusions”). Davis and Jurgenson (2014) define context collisions as “those occasions in which contexts come together without any effort on the part of the actor, and sometimes, unbeknownst to the actor, with potentially chaotic results” (p. 481) or the violation of privacy rules under the condition of collapsing contexts (Davis and Jurgenson, 2014).

0. Context as Legacy and Determinant

The cultural-historical perspective views context as the legacy of past activities and as a determinant of present activities (Allen, Karanasios, and Slavova, 2011). Here, “context is viewed simultaneously as a byproduct and a determinant of history, embedded in action. The present context is a result of the social pressures of the past and past actions, giving rise to current practices and meanings, and it creates a cultural environment that impacts on the available courses of action for the future” (Allen, Karanasios, and Slavova, 2011, p. 783). Here, we can understand context as the set of circumstances of the past, and how the actor(s) reacted to them (by engaging in information behavior), which give rise to circumstances of the present (the present context as viewed by the actor) that will inform the actor’s reactions and choices in information behavior. These reactions and choices/behavior, in turn, create or influence the context for the actor and other actors connected to or affected by the person.

1.3 CHAPTER SUMMARY

In this chapter, we briefly looked at the research field of information behavior. We saw the difficulty in trying to define context, and discussed the many definitions and types of context that researchers have studied. Thus, context could be an environment or container, a setting, a role, a situation, the actor’s mind, information horizon/field and pathways, constraint, life world/information world,
common ground and ordinariness, discourse, information ground, interaction, proximity and relevance, time, place, embodiment and portability, or legacy and determinant. This listing of types of context described above is important, but not exhaustive. Different researchers use different set of terms to distinguish context types. Schmidt, Beigl, and Gellesen (1998) distinguish between context relating to human factors and context relating to the physical environment. Chen and Kotz (2000) propose four categories of contexts: computing context, physical context, user context and time context. Ingwersen and Järvelin (2005) describe organizational, social, and cultural context. Here, the organizational context is closer to context as setting, and the social context has similarities with common ground, discourse, and information ground discussed above. Lee (2011, p. 99) also lists taxonomies of context proposed by different researchers. Fidel (2012) distinguishes fluid and dynamic context from identifiable and stable context. She also makes a distinction between real vs. perceived context. Ingwersen and Järvelin (2005) nest the information retrieval context within the seeking context, which, in turn, is nested within the work task context, which is nested within the socio-organizational context.

What we have discussed (and is of interest in this book) is the context of an actor when interacting with information. The study of context itself can be approached from many perspectives, “such as the context surrounding documents, the context influencing actors and tasks, [and] the context affecting interaction and its instances of implicit and explicit relevance feedback” (description of first IIIx). Lee (2011) describes a framework on contextual information in digital collections. While researchers have most talked about the context influencing actors and tasks, the other perspectives of context can all affect the actor. For example, the context surrounding information sources (e.g., Agarwal, 2011; Agarwal, Xu, and Poo, 2011) does affect the actor’s information horizon (Sonnenwald, 1999) when looking for information.

In the next chapter, we will review the literature on the influence of context of information behavior. This comprehensive review will help us determine what has happened in the field—as it relates to context—thus far. This will be useful as I put forward my own thinking on context in Chapters 3, 4, and 5, where we map the conceptual space and finally arrive at a definition for context.