Introduction

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The purpose of this book is to establish a focus on affective and emotional dimensions in information behavior (IB) research, based upon recent theoretical developments and research findings in information science and the cognate fields of cognitive science, psychology, business, education, ethnomethodology, communication, neuroscience, and computer science. The affective paradigm established in this book traces its origins to early work in education and cognitive science. In 1950, Erik Erikson published his still-influential theory of socio-emotional development from birth to old age. In 1956, Benjamin Bloom, David Krathwohl, and Bertram Masia published the taxonomy of the affective domain that is still used to develop instruction according to the principle of internalization. In the late 1960s, Herbert Simon (1967) identified emotion as a major challenge to cognitive science due to emotion's determining effect on cognition.

This book introduces the emerging research areas of affective issues in situated information seeking and use, and the affective paradigm applied to IB in a variety of populations, cultures, and contexts. The book is primarily concerned with IB research findings on the user perspective, the user experience, and how emotional aspects can be interpreted, mitigated, or enhanced through design that is informed by use and by users who directly participate in information design. The chapters in the book present IB research relating to a variety of theories, Web technologies, everyday settings, populations, communities, ages, ethnicities, and cultures that are engaged in information seeking and use, and the research employed a variety of qualitative and quantitative methodologies that demonstrate how emotion can be measured in diverse settings.

Over the past 35 years, social sciences research has developed ethnographic, observational, and self-reporting methodologies capable of examining the higher mental and emotional processes involved in naturalistic or situated behavior. This user-based methodological trend is driven by the need to reduce artificiality by obtaining concurrent process data that is collected as

behavior occurs, as well as to obtain user discourse about information, information systems, and information settings. Cognitive and affective data that is inherent in actual situations is needed to create information environments, systems, and services that are truly responsive to the needs of the individuals inhabiting and using these settings. Such data permit analyses of situated cognitive and affective processes, yielding much needed knowledge of the dynamic role of motivation, emotions, feelings, values, and preferences in influencing choice-making and decision-making.

While it can be said that there has been inattention to affect in information science, a cadre of key researchers has pursued the examination of the domain of affect, emotion, feeling, mood, sentiment, affection, disposition, preference, interest, value, motivation, intention, and goals with respect to information seeking and use. One could say that this work began with Herbert Simon (1967, p. 29) who defined this research area for information science when he wrote, "Since in actual human behavior motive and emotion are major influences on the course of cognitive behavior, a general theory of thinking and problem solving must incorporate such influences." Over the past 25 years, information scientists have applied these process- and context-rich methodologies to examine situated information processing and use in order to gain a fuller understanding of IB. This research has revealed the vital role of emotions and affect in information processing and use. Early studies include: Belkin, 1980; Dervin, 1983; Ingwerson, 1992; Kuhlthau, 1988; Mellon, 1986; Nahl & Jakobovits, 1985; Wilson, 1981; among others.

This peer-reviewed volume evolved through a confluence of scholarly activities, including the first panels on Emotional Design organized by Diane Nahl at the ASIST 2004 and 2005 annual meetings that drew crowds of interested IB researchers, generating synergy around the topic. In 2005, Carol Collier Kuhlthau was awarded the ASIST Information Science Research Award, recognizing her work on the information search process model, a holistic information behavior model with a significant emphasis on affective information behavior. The inception for this book occurred at the conclusion of the 2005 panel because it was clear that there existed a community of researchers exploring the role of affect in information behavior (IB) and that the group's work could benefit from dissemination and collaboration. The Special Interest Group on Information Needs, Seeking and Use (SIG USE) decided to make affect and IB the focus of the next Research Symposium organized by Nahl and Bilal. The focal moment to introduce this book to the IB research community was the 6th Annual SIG USE Research Symposium at the 2006 annual meeting of the American Society for Information Science and Technology (ASIST), titled Information Realities: Exploring Affective and Emotional Aspects in Information Seeking and Use. The symposium drew applications from more than 40 information behavior researchers who have taken the affective turn in their data analysis and research design, some of whom are contributors to this volume.

This work demonstrates the deepening realization in information science that technology is deployed within a mental environment of emotions and thoughts. The "information environment" is actually the interactional sphere of a group of people enacting in social life the emotions and intentions they choose to exercise with each other. An information community differs from another by the quality of such choices. Members differ in the satisficing of particular emotions that attach value to a set of choices, and they differ in the intentions through which they wish to optimize an information facility. This is the emotional reality upon which the entire edifice of information technology is constructed.

The chapters in this volume represent the efforts of information behavior researchers who are in the process of charting the emotional quality of the information environment in a wide variety of social spheres and in diverse populations. The contributions are divided into four parts: The first examines theoretical treatments of the role of emotion in information behavior, the second and third represent empirical studies distinguished by methodological level of analysis of emotion, and the fourth is characterized by analyses of disturbances in the information environment. As a whole, these chapters define the role of affect in information behavior and serve as the forerunners of future research into the emotional information environment. The benefits of a holistic approach to studying IB in context will include the development of new design principles that enable the creation of humane interfaces, services, and information settings. The development of new information systems and services, as well as theoretical and empirical investigations, must take into account emotional and affective factors. This volume represents an effort to develop a holistic approach to the human-centered paradigm.

The four chapters in Part I create a theoretical context for integrating emotions into the information environment to reflect the centrality of the affective domain in all human activity. In the socio-cultural sphere of information ecology, *information reception* is keyed to "user acceptance," and this individual judgment to accept or reject information is the consequence of a prior emotional value that the individual accepts in common with others in a particular community of practice. *Information use* is keyed to the feeling of wanting to do something with the information that has been received, such as telling someone else, or buying it, or selling it, or using it to achieve something more effectively, and so on. Both information reception and use are therefore grounded in social feelings, emotions, and intentions. Further, emotion concerning information is manifold, dynamic, situation-bound, context-dependent, and representative of group practices with information. This is the affective reality to which technology responds in the era of emotional design. Adults and children experience systems emotionally and cognitively, but children's experience differs at various developmental stages.

Chapters 5–9 in Part II present a wide variety of details on how the flow of emotions is actualized in the information practice of people on their daily

round. It charts the macro-emotional information environment of adults and children as observed in their social and mental activities while striving to adapt and cope, and thus meet their goals. The chapters report on global measures of affect as they apply to situated information behavior. Every technological detail is deemed a pleasure or a pain, a breeze or a headache, a barrier or an assist.

Chapters 10–14 in Part III detail the micro-components of emotionality that shape the information experience and condition its behavioral manifestations in a variety of settings. Human beings keep track of their emotions and feelings in specific information settings and in relation to particular information content. From the perspective of users, there is no clear distinction between emotional reactions during information reception and the technological environment that provides access to participate. These chapters show that emotion and feeling are general terms for a variety of affective activities during information reception and use. Discovering these micro-human operations has become essential to emotional design.

Chapters 15–17 in Part IV present studies documenting the emotional intensification of the information environment when a break occurs in human symbiosis with technology, due to physical disability or demographic estrangement from the information culture. Being blind, foreign, and poor are biographical states that displace the ordinary solutions available to others. Emotion, feeling, value, and identity are virtual gatekeepers that condition what people are willing to notice or ignore, to accept or to oppose, to engage or avoid.

In Chapter 1, Diane Nahl presents a theoretical context suitable for discussing the details of how the emotional information environment is created by the symbiotic interaction between technological systems and the user's feelings and intentions. Both information reception and use involve all three biological systems: the affective, the cognitive, and the sensorimotor. Receiving information is identified as a process of adaptation or coping with the information environment. This involves the ways people notice information (sensorimotor) when interacting with a system through *satisficing affordances* or features that people can use to receive information. After noticing the information, users then appraise it (cognitive), and then attach value to it by emotional or consummatory processing (affective).

During the second phase of information use, people form an intention or motivation (affective) that directs their thinking into a plan (cognitive) that is executed (sensorimotor) by interacting with the system's *optimizing affordances* or features that allow users to enter commands. Evidence is presented from discourse analysis of user self-reports, which shows that information behavior viewed at both the macro and micro levels is a regulated flow of cognitive-affective procedures that the user operates in conformity with the group norms in a community of practice.

In Chapter 2, Dania Bilal presents major child-development theories, outlining the cognitive and affective abilities of children as they mature through stages of growth. Because information system design for children is based on adults, design has not taken child development into account. Bilal presents data from a number of studies that have identified areas of difficulty that can be addressed developmentally in system design, through corrective feedback and mediator functions, including taxonomy development, engaging and concrete visual representations, spell-checking, context-driven help, clear levels of complexity for appropriate learning challenge, and other features to support children in different developmental stages.

In Chapter 3, Brenda Dervin and CarrieLynn Reinhard make it clear that the affective dimension of emotions has "always been incorporated into the framework" of "universals of human sense-making" and "sense-unmaking." The authors describe themselves as "entering the study of emotions through different doors" by conceptualizing emotions and feelings as inner mental activities "arising out of situations, tasks, or contexts or their sub-parts." Affective mental states are defined as "attributes of persons" such as socio-cultural personality features that are the source of the motivations, goals, and purposes people have when performing information behavior acts. Furthermore, the awareness of one's own mental states and their quality (positive or negative for example) has information value to the person.

Because information seeking and use are highly situated, it follows that the role of emotions in information behavior varies with the situation. Informants in the study described the details of recent situations of scholarly or personal research using electronic resources, and focusing especially on experiences that they found "challenging, important, confusing, emotional, unfamiliar, and contradictory." The "person-in-situation sense-making analysis" of the "informant narratives" indicates a highly complex confluence of emotions in each situation in relation to people's assessment of the outcome. Still, positive emotions are associated with better outcomes, confirming a solid trend noted throughout the other chapters as well. This chapter makes it clear that further research is needed to clarify what Dervin and Reinhard call "the ebb and flow of situational assessments" that people perform throughout their information seeking efforts.

In Chapter 4, Nicola Parker and Jennifer Berryman take the theoretical position that "affect is conceptualized as a system that activates cognitive, physiological and behavioral components, or actions." Since information behavior involves a sequence of actions constructed by the individual in real time, it becomes important to understand how a subsequence ends and another begins. Parker and Berryman monitored these critical directional choice points, which they termed 'What is enough?', an expression used by Herbert Simon in defining "bounded rationality" or what constitutes "satisficing" to a decision-maker. Parker and Berryman differentiate "the action of stopping or continuing ... from the evaluations that precede that action."

Content analysis of extensive interview tapes and transcripts uncovered several distinctive types of affective evaluations in relation to when postgraduate searchers decided they have "enough" information to complete an assignment. The affective components of "enough" in an information processing task emerged as (1) the feeling of wanting to gain control and wanting to finish, (2) the desire to optimize the search effort, (3) seeking the feeling of interest and pleasure through engagement and understanding, (4) the feeling of satisfaction that marks the completion of the process, and (5) experiencing the inherent desire for generation and creation, and its growth producing self-satisfaction. As Parker and Berryman aptly put it: "Affect infused everything."

In Chapter 5, Lesley Farmer examines how personality features of users impact their motivation for information seeking and the "mechanisms used in engaging with information." One of the issues addressed is whether affective personality traits are "permanent, or do they grow and change developmentally?" For instance, confidence, coordination, control, composure, and persistence are personality traits that impact information behavior. One way to measure information behavior in a new context is to use established sets of information literacy competencies, which include such skills as "problem identification and solving, communication skills, and social skills of cooperation and help-seeking. Thus, as students exhibit positive social-emotional behavior, they may be more likely to achieve information literacy competency."

What is the basis for expecting correlations between personality traits and information behavior? Consider a searcher's motivation to enact persistence, which is the affective energy to postpone quitting. Searchers with less persistence quit too soon, losing the motivation to continue searching. Searchers who persist are more successful. Persistence in searching is best measured directly through observing how people search under various conditions and for various purposes, and especially, when they quit a task or procedure.

Correlational research may be helpful in identifying the factors that need to be studied more directly. Farmer provides modest correlational evidence that high school students who rate themselves higher on socio-emotional scales also exhibit more successful information behavior patterns such as wanting to share information activities by communicating with others, or making a greater effort to be organized. Other traits identified include a greater willingness to check work when finished and to "participate in new activities and to try even when schoolwork is hard."

Further research is needed to determine how socio-emotional traits vary for the same individuals across a variety of information settings and tasks in which they regularly participate as members of a community of practice. Research must explain theoretically how these affective traits intervene and produce the variation in the observed information behavior.

In Chapter 6, Michelynn McKnight presents findings on information behavior in an "intense information ecology" with life and death consequences. "Professional nurses must pay close attention to everyone's affective behaviors, including their own." Critical care nursing involves both direct patient care and information management of multiple medical data on each patient known as "the chart." The progressive increase in the complexity of patient charts is known to be a source of intense stress on nurses. The feelings they express are similar to those of searchers who are intimidated by the technological complexity of the experience in time pressure, frustration, uncertainty, and self-doubt.

McKnight discovered that the negative affect of both male and female nurses freely expressed during the information management task is typically inhibited or transformed into positive enactments when giving direct patient care. Frustration was overtly expressed during records management in the presence of other nurses. Recurrent problems included interruptions (e.g., phone, call button), illegible handwriting, unavailability of people with the needed information, navigation difficulty in online systems, multitasking demands, social protocol barriers, malfunctioning of ancillary equipment, misplacing of a document or slip of paper, missing items on a record, and disappearing records or printouts.

When nurses switched tasks to direct patient care, they "were observed stopping before the door, taking a deep breath and waiting a beat to compose themselves. The nurses consistently made this conscious change in their outward demeanor." Nurses presented an affective demeanor that contrasted with what they were expressing with each other moments before in the records management setting. The reverse happens when nurses exit the patient's room.

Chapter 7 by Sheri Massey, Allison Druin, and Ann Carlson Weeks shows that the emotions children feel while reading help them construct an intuitive scheme for categorizing books they are reading, discussing, and recommending to each other. The authors used a longitudinal approach to observe the behavior of children from several countries while they wrote and shared their views of self-selected and preselected books from the International Children's Digital Library (ICDL), which makes it possible "to explore patterns in readers' responses to identical works in multiple international settings."

Reader response research reviewed in the chapter suggests "in order to understand response it is necessary to explore attributes of not only the text and the reader, but also of the socio-cultural context in which the reading transaction occurs." This "anthropological" view of the reader states that "emotions are cultural artifacts and must be analyzed within the social and cultural contexts in which they are experienced."

In this study, children were provided with laptop computers and access to the digital library. Children were asked to rate each book they read along several dimensions of feeling and emotion (e.g., How does this book make you

feel? Happy, sad, scared, funny, or other. This book made me feel this way because ..."). An interesting finding from content analysis of the children's book reviews is children's emotional experiences change frequently during the reading transaction. Another interesting finding is "in books with strong morals or messages, the children's emotional responses were remarkably similar across study sites." One important recommendation of this research is to point to the need for a classification scheme that "allows children to search for books by how it might make them feel."

In Chapter 8, Lisa Given explores the "emotional underpinnings of students' information behaviors" as a social context for constructing information services that support their academic activities. The use of affective traits as an internal context for information behavior is part of the ecological, holistic, and experiential approaches in information science. Information behavior becomes part of the individual's life strategy for inclusion and approval in the never-ending effort of constructing one's social identity. The external public information ecology interlocks with the internal private affective and cognitive ecology.

In Given's "model of the affective information behavior ecology," human feelings and information technology become inextricably linked or intermeshed. Campus academic policies and services have an impact on both the students' emotions and how or when they make use of the available information technology. Given identifies the "macro-emotional context" that shapes students' information behaviors. For example, students on a fast-track program experience frustration and anger when discovering that online courses will not be supported. In the experience of the student, the affective "micro-information sphere" (e.g., joy, surprise, anger, fear, frustration, alienation, resentment) conflicts with the "macro-information sphere" (what is available and accessible, and what is not). Understanding this relationship can guide information policy.

In Chapter 9, Rich Gazan reports on a study about the affective behavior of participants in an online community who "violate the community's rules or spirit." Rogue information behavior has been observed in online communities and is attributed to the desire to exert control over group attitudes and communication practices. Rogue behaviors observed include vindictive rating of others' contributions, the use of abusive language, flooding suggestion boxes, excessive contact with administrators, and creating separately registered identities.

Gazan was interested in characterizing the negative affective features that are infused into the information environment by the action of rogue behaviors. They are a source of negative emotions expressed by other group members and influence the pattern of community participation. The data show a change in the emotional environment of the online community when a new information facility was provided allowing users "to construct enhanced personal profile pages on the site." Rogue behaviors diminished. Interestingly,

while only a few members have availed themselves of this new facility, the majority of former rogues have.

Chapter 10 by Lynne (E. F.) McKechnie, Catherine Sheldrick Ross, and Paulette Rothbauer shows that affective responses during "pleasure reading" that have an influence on information behavior of children are confirmed and extended to adults. Readers of books talk about their "emotional connections to textual worlds" and describe books as "emotional touchstones." Information behavior with books is connected to the affective reactions and evaluations that readers experience while interacting with a book.

An important theme is that the feelings or emotions that readers experience appear subjectively as being exclusively one's own private reaction, though they are tied to group practices. When children and adult readers discover their own private feelings accurately described as the feelings of a character, the result is a strengthening of the acculturation process by which an individual becomes a participant and practitioner of a group community process. The authors conclude that "the affective significance of reading" is that the "elicitation of emotions can yield a part of the information transformative insights." The authors recommend that affective variables be made part of the information retrieval approach.

In Chapter 11, Helena Mentis reviews the literature on how negative emotions are ordinary in people's experience with information technology. It is clear that people experience frustration in routine interaction with systems that "thwart" some immediate goal (e.g., "specific bugs in the software, systems freezing or crashing, auto-formatting, pop-up windows, slow system response"). These incidents cause an interruption in the workflow, which is experienced as frustration since "they take control away from the user."

Mentis concludes that "unanticipated interruptions" are more critical to users than the designer's concept of system "efficiency." Users retain a vivid "memory of emotions" associated with particular systems such as the frustration experienced when the computer takes control, and especially when the user is uncertain how to regain control. Mentis concludes "in order to design for emotion, we need a better understanding of the occurrence of particular emotions in an information systems environment."

Chapter 12 by Karen Fisher and Carol Landry shows that "affect is a major factor in determining" how the information needs of stay-at-home mothers are created and shared. They trace the expanding literature that attempts to empirically describe how feelings, emotions, and intentions shape the information environment in real life contexts by providing emotional support and promoting community building. Affect associated with information seeking and sharing plays a decisive role due to the overwhelming nature of intense emotions, whether positive, such as feeling safe or empowered, or negative, such as revulsion or resentment.

In monitoring the information behavior of stay-at-home mothers, the researchers identified 25 particular positive and negative emotions associated with their information behavior (e.g., anticipation, curiosity, gratitude, optimism, and empowerment vs. fear, doubt, confusion, anger, worry, and frustration). Some of the social settings identified in the study as rich information grounds for stay-at-home mothers include structured children's activities, shopping in stores, park playgrounds, and planned neighborhood activities. A theoretically important focus of this research is its motivation to trace the "sociodemographic characteristics" that shape everyday information behavior in a technological environment.

In Chapter 13, Nahyun Kwon explores further the known relationship among college students between "library anxiety" and "critical thinking disposition," focusing on the "motivation to decide what to believe and what to do when one approaches problems, ideas, decisions, or issues." A variety of negative emotions allied to anxiety may occur during an initial encounter with the formalized procedures of an academic library. Part of successfully coping in this emotional information environment consists of constructing workable cognitive justifications for what is happening.

One of the consequences of experiencing intense negative affect in the library environment is the disruption of and interference with cognitive procedures that could be helpful in coping with overwhelming anxiety. On the other hand, the desire to be inquisitive, the motivation to be well informed, or the readiness to ask for help are positive affective procedures that lead to more precise cognitive distinctions—for instance, making a cognitive separation between a momentary emotional challenge one feels, and the value and convenience of the library one knows. The affective procedures constructed by successful students to cope with their library anxiety are affective coping skills that can be taught as part of information literacy.

In Chapter 14, Heidi Julien explores a new angle on information literacy instruction that has long been integral to academic libraries. As indicated in the chapter, public libraries are increasingly adopting this same perspective on education for information literacy. Julien confirms by empirical observation that "affective issues such as confidence are primary variables in people's use of online information sources." The affective component of information use skills includes "self-perceptions of one's own literacy." Julien examines how these reflexive self-evaluations influence users' information behavior related to online access.

Analysis of tape-recorded interviews of public library patrons in Canada indicated a variety of emotional involvement in their Internet use. There was a feeling of personal empowerment when people were able to use the Internet on their own at will, and a sense of satisfaction at being able to do so independently without having to ask for help. Interestingly, Julien also found the opposite emotional involvement with some people who appeared to focus negatively on their own traits, such as feeling impatient, inadequate, or

anxious. One of Julien's conclusions is that "since self-efficacy and success are related, developing learners' positive feelings about their information literacy skills could become a standard objective of training efforts."

Chapter 15 by Susan Hayter examines information reception and sharing as an interpersonal process, showing how information behavior is conditioned by the quality of the "support systems" that are operative in a particular community or group context. This is particularly visible in the case of "marginalized groups and settings" such as the working poor, a retirement community, or female prisoners. Information access is inhibited or facilitated by people's socio-cultural perceptions of the information source and its affective context.

Hayter examines some life conditions that create a social category of people referred to as "information poor," who face intellectual barriers stemming from their "disadvantaged" relationship to information access. Social setting features that created barriers to access included "insularity, cultural issues, and everyday problems." Information trust is limited to group members and is not extended to "strangers" such as information professionals. Availability of sources of help was not a sufficient condition for accessing that source due to negative social expectations associated with them.

According to Hayter, the "affective elements determined many aspects of the participants' information behaviour." The word "information" was associated with the threatening perception of societal attempts to breach the privacy of socially marginal people. Trusted information sources included friends, family, and "trusted expert workers in the community centre." Outside help with a personal problem was considered only in extreme situations. According to Hayter, who spent significant ethnographic time with a community, "Information that many of us would access easily was very difficult for the residents of this community because of affective issues of fear and anxiety." Some methods are identified for developing a "trusting relationship with information providers." These include working in partnership with community workers and using interpersonal approaches that built cumulative trust.

In Chapter 16, Wooseob Jeong reviews the research on information seeking behavior of the visually impaired. "The Internet is an important part of visually impaired people's information seeking no less than sighted people's." The Web's visual and spatial construction through multiple hypertext links provides a deep challenge to blind people forced to perform "information seeking in linear mode." The visually handicapped are routinely excluded from participating in information communities as social equals since interactive technology incorporates a strong visual approach. Consider the feelings of alienation and bewilderment when clicking on a link to land unexpectedly on a foreign page whose script offers no clues as to the meaning of the content.

Jeong discovered that when adequate technology for the visually impaired is available, there is active participation in a full variety of Internet activities, including daily email and Web surfing, instant messaging (IM) and chat, and online community projects. The visually impaired also play computer games cued to sound in a linear mode, which is why it is difficult for sighted onlookers to follow what's going on.

In Chapter 17, Bharat Mehra focuses on the "intersections between emotions, actions, and learning as a process of construction during 'sense making' in a culturally alien information environment." International LIS students studying in the U.S. have to learn to function in such information environments. Mehra's narrative interviews of international doctoral students at one university brings to fore the affective, cognitive, and sensorimotor strategies they use in the attempt to cope with information elements and procedures that raise conflicting emotions and doubts.

Although there was significant variation among students in relation to their country of origin, nevertheless they shared some overlapping experiences and challenges. These "commonalities" are related to the social setting requirements of being a foreign graduate student, which involves completing a sequence of enculturating procedures over several months or longer. These include anticipation jitters prior to program initiation, followed by "overwhelming information clutter" as the students gradually acquire the "dominant American way of doing things," which demands that they "de-condition" their past information experiences. Mehra describes the final stage as "enlightened adaptation." The cross-cultural setting of this study has global implications for facilitating information sharing. The "internationalization" of LIS education in the U.S. may become an important factor in promoting "global interconnectedness and interdependence" by creating "globally dispersed knowledge networks."

It is hoped that this volume will inspire those working in information behavior and the related areas of human–computer interaction, information system design, and social informatics, to examine data in the light of the theories and findings presented, and to design studies that focus on the central role of affect in information needs, seeking, reception, design, and use. A focus on affect in information behavior can breathe new life into research by expanding research environments to include every setting where people use and exchange information, including the mental and social information environment, and promote a cumulative and holistic approach to understanding human engagement with information.

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