Affective issues in library and information science systems work: A content analysis

Heidi Julien\textsuperscript{a,*}, Lynne E.F. McKechnie\textsuperscript{b}, Sandra Hart\textsuperscript{a}

\textsuperscript{a}School of Library and Information Studies, University of Alberta, 3-20 Rutherford South, Edmonton, Alberta, Canada T6G 2J4
\textsuperscript{b}Faculty of Information and Media Studies, The University of Western Ontario, North Campus Building, Room 240, London, Ontario, Canada N6A 5B7

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Abstract

Increasing attention to affective issues is evident in human information behavior work in library and information science (LIS) as well as in a wide range of other disciplines. However, it is questionable whether the LIS systems-oriented literature reflects any serious interest in affective issues such as emotion or confidence, as these affect information behavior. This study analyzes systems work in LIS to determine the relative interest in affective issues being shown. Content analysis of articles published between 1999 and 2003 indicates that systems work in LIS pays little attention to affective variables. In addition, insufficient intellectual access to affective issues is provided by the primary indexing services.

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1. Introduction

The importance of “user-centeredness” was core to Dervin and Nilan’s analysis of library and information science (LIS) nearly two decades ago (Dervin & Nilan, 1986). They also outlined the gap that existed then between “systems-centered” and “user-centered”
perspectives in our research and practice. In general, the gap between these perspectives seems to have persisted. For example, Schamber (1994) reviewed research in information retrieval relevance and attributed searching behavior to cognitive and situational factors but did not recognize affective issues. There have been exceptions to this trend. Barry (1994) found that “affectiveness” (p. 155) was used by searchers as a criterion for judging relevance. Later, Wang and Soergel (1998) suggested that documents may be judged relevant on the basis of their emotional value. More recently, Kracker and Wang (2002) studied the relationship between research anxiety and students’ perceptions of research. Despite these exceptions, the vast majority of research on information systems remains systems centered, and regret continues to be expressed about the gap between information behavior (more typically user-centered) and information retrieval (more typically systems-centered) research. For instance, Saracevic (1999) recently wrote, “Information science will become a full-fledged discipline when the two ends are connected successfully” (p. 1055). He suggests that a lack of connection remains because systems-oriented researchers do not listen to user-centered researchers, while the latter fail to speak effectively to the former. Saracevic also suggests that user-centered researchers ought to provide “concrete design suggestions” (p. 1057). Nevertheless, he sees some progress, claiming that information retrieval research has recognized that relevance includes “motivational or affective relevance” defined as the “relation between the intents, goals, and motivations of a user and texts retrieved by a system, or in the file of a system, or even in existence. Satisfaction, success, accomplishment, and the like are the criteria for inferring motivational relevance” (p. 1059). While this seems to be a limited definition of affect and its relationship with information behavior, by Saracevic’s account, at least some aspects are being considered by systems-oriented researchers. This would indeed constitute a closing of the gap between systems- and user-oriented perspectives, since considerations of “affect,” which more broadly includes emotion, mood, preference, and evaluation, are increasingly viewed as central to the user-centered perspective in LIS.

This increasing attention to affective issues also is evident outside of LIS, in a wide range of disciplines, where affect is associated with human information behavior. In the computing literature, self-efficacy is a well-recognized variable in information technology use (e.g., Chau, 2001). At the Massachusetts Institute of Technology (MIT) Media Lab, Picard’s “affective computing” project is very compelling (Affective Computing, 2005). A recent issue of the International Journal of Human–Computer Studies (volume 59) was devoted to affective computing, and many of the contributed articles come from Picard’s research team. In her introduction to that special issue, Hudlicka (2003b) notes that responses to concern for affective issues have led to “techniques and devices for assessing user state (e.g., eye tracking, facial expression recognition, wearable computers such as earrings collecting physiological data...‘expression glasses’ detecting interest or confusion...through integrated systems functioning as socially intelligent agents...to high level ‘paradigm shifts’ in thinking about HCI [human–computer interaction]” (pp. 1–2). In contrast to Saracevic (1999), Hudlicka suggests that “the burden of adaptation has gradually been shifting from the human user to the computer...the user is now the central component of system design and user needs drive both the nature of the user interface, and
the function allocation of tasks between the user and the machine” (p. 2). The challenges being addressed include affect sensing and recognition, adapting to user affect, machine ‘affect expression’, and modeling affect in user and machine (Hudlicka, 2003b). Hudlicka goes on to suggest that affect in HCI needs to be addressed by seeking to “understand the range of user affective states and their effects” (p. 7), “accurately recognizing the user’s affective state” (p. 8), and determining “whether or not the system should respond to this state, and how” (p. 8). The term “affective computing” is not without its detractors and is problematized in at least two articles in that special issue (Hudlicka, 2003a; McNeese, 2003).

The role of affect in information behavior also is evidently of interest in the literatures of marketing, organizational management, health, communication, psychology, and other disciplines. For example, in recent marketing research, affect has a role in consumers’ satisfaction with Internet service providers (Erevelles, Srinivasan, & Rangel, 2003). In predicting the influence of advertising, affect is a better predictor of consumer action than was cognition (Morris, Woo, Geason, & Kim, 2002). Research in organizational management has found that “attitudes” about sharing information have an effect on organizational information behavior (Kolekofski & Heminger, 2003). Specifically, self-efficacy influences information-sharing behavior (Bock & Kim, 2002). The importance of affect in cross-cultural organizational contexts also has been explored (Schneider, 2002), and affect has a central role in workplace judgments and decision making (Forgas & George, 2001). The role of affective rewards in levels of engagement in group support systems also has been studied (Reinig, Briggs, Shepherd, Yen, & Nunamaker, 1995/1996). In addition, affective factors, such as self-esteem, influence information sought by subordinates of their superiors (Madzar, 2001).

In the communication field, the role of affect in human information behavior has long been recognized. This acknowledgment is manifest in a study analyzing survivors’ information seeking following a workforce reduction (Casey, Miller, & Johnson, 1997). Similarly, in another communication paper, affective responses such as fear influences people’s tendency to seek information (Roser & Thompson, 1995). A very recent communications study suggests that emotions help people to frame issues, influence judgments about information accessibility, and guide decision making (Nabi, 2003). The role of self-efficacy in Web use (Kaye & Johnson, 2002) and in information seeking in health contexts (Rimal & Real, 2003) also has been studied in the field of communications.

Information behavior in health contexts has received widespread attention, and the centrality of affect is well recognized. For example, feelings of confidence, sense of control, worry, fear, and depression all play a role in information seeking by women with breast cancer (Rees & Bath, 2001), and information seeking to address cancer patients’ emotional needs has been explored in other studies (e.g., McGrath, 1999). Information seeking by cancer patients has been associated with the fear and stigma connected with seeking emotional support (Matthews, Sellergren, Manfredi, & Williams, 2002). The role of anxiety has been explored among AIDS information seekers (Scott, Jorgensen, & Suarez, 1998) and in children awaiting surgery (Thompson, 1994). Information seeking by surgical patients also has been found to be related to “emotional arousal” (Krohne, De Bruin, El-
Giamal, & Schmukle, 2000), while health information seeking in general is affected by emotional response to information about health risk (Griffin, Dunwoody, & Neuwirth, 1999).

In psychology too, affect is recognized as central to information behavior. Affect may even be considered a form of information (Ketelaar & Tung Au, 2003). For example, people’s moods influence information recall and information processing as well as information impact (Raghunathan & Trope, 2002). Information behavior also is influenced by goal orientations and their relationship to happiness (McIntosh, Martin, & Jones, 2001). In addition, the effect of test anxiety on information searching has been explored (Nichols-Hoppe & Beach, 1990), and anxiety in general has been found to be related to information seeking (Frey, Stahlberg, & Fries, 1986). Interestingly, depression has been linked to increased information seeking (Hildebrand-Saints & Weary, 1989), and self-esteem (Schulz & Hanusa, 1988) and self-efficacy (Brown, Ganesan, & Challagalla, 2001) have been related to information seeking.


Despite all these investigations in numerous fields, including LIS, that demonstrate the importance of affect in human information behavior, and the efforts of MIT’s Media Lab to apply such understanding to systems design, it is questionable whether the systems-oriented literature (whether published research or other types of publications) in our discipline yet reflects any serious interest in affect.
2. Problem statement

This study was undertaken to analyze systems literature systemically to determine the relative interest in affective issues being shown. The central concern was that while it is clear that affect is important to human information behavior, work on “systems” (formal ways of connecting people with information) may not be taking affect into account. The specific research questions examined were as follows:

- To what extent is “affect” (defined as emotion, mood, preference, and evaluation [from a non-cognitive perspective]) considered in articles related to “systems”?
- Are readers interested in affective issues in systems work able to obtain intellectual access to that work?

3. Method

This study applied content analysis to the top five “information science/library and information science” journals as ranked by impact factor (Journal Citation Reports, 2004). Those journals are as follows:

- **MIS Quarterly** (ISSN 0276-7783), a peer-reviewed journal focusing on “the management of information technology and the use of information technology for managerial and organizational purposes” (MISQ Central, 2004, para. 1).
- **Annual Review of Information Science and Technology** (ISSN 0066-4200). Not strictly a journal but included in Journal Citation Reports, this yearly volume “surveys the landscape of information science and technology, providing the reader with an analytical, authoritative and accessible overview of recent trends and significant developments” (Annual Review of Information Science and Technology, 2004, para. 1).
- **Journal of the American Society for Information Science and Technology** (ISSN 1532-2882). Peer reviewed and published 14 times per year, “this journal serves as a forum for new research in information transfer and communication processes in general, and in the context of recorded knowledge in particular” (Journal of the American Society for Information Science and Technology, 2004, para. 1).
- **Journal of Documentation** (ISSN 0022-0418). This peer-reviewed journal focuses “on theories, concepts, models, frameworks, and philosophies in the information sciences” (Journal of Documentation, n.d., para. 1).
- **Information Processing & Management** (ISSN 0306-4573). A peer-reviewed journal covering a range of “basic and applied research in information science, computer science, cognitive science and related areas” (Information Processing & Management, 2004, para. 2).

The justification for selecting these journals is their unambiguous importance and influence in the field of library and information science, identified according to the degree to which authors in the field cite articles from these journals. There is no doubt that other claims
for importance could be made for other journal titles; however, a reasonably objective way to identify influence or importance is by citation analyses. It is in the field’s leading journals that readers might expect to find attention paid to the full range of variables affecting human information behavior as it relates to systems use and design.

Within the 5-year period, 1999–2003, we identified all articles published in these journals that were about “systems,” defined as those articles that explicitly discussed the design or use of computerized information and retrieval systems to some degree, a definition used previously (Julien, 1996, 1999). The analysis ended with the year 2003 to ensure that articles were already indexed. The sample included only feature articles and excluded editorials, book reviews, and news items. Within the five journals for the 5-year period, 716 articles about systems were identified:

- 62 articles from *MIS Quarterly*;
- 26 articles from the *Annual Review of Information Science and Technology*;
- 370 articles from the *Journal of the American Society for Information Science and Technology*;
- 82 articles from the *Journal of Documentation*; and
- 177 articles from *Information Processing & Management*.

In order to make coding logistically manageable and to ensure that results remained generalizable to the entire set of systems-related literature for that period, approximately one-third of those articles in the sample ($n = 242$) were identified by random selection, proportional to the number of systems articles in each journal. Content analysis was used to determine whether any attention to “affect” was given in these articles. The content analysis categories included the following:

1. Type of article (report of empirical research, literature review, theory paper, method paper, verbal argumentation, descriptive, discourse analysis, historical, mathematical modeling, other) (these categories were developed and applied successfully in previous work) (McKechnie, Baker, Greenwood, & Julien, 2002).
2. Affiliation of first author (professional, academic, other/not discernable) (McKechnie et al., 2002).
3. Indexing (in *Library Literature and Information Science Full-Text (LL)* and in *Library and Information Science Abstracts (LISA)*). Affect-related descriptors also were recorded.
4. Treatment of affect (examples of each category are provided in the presentation of results):
   a. Major theme or topic of discussion (the author(s) explicitly addressed and discussed some aspect of affect).
   b. Minimal discussion (affect was mentioned in passing, without discussion of the meaning or implication of affective factors).
   c. Peripheral discussion (aspects of affect were included in the research, but other than stating the research results, there was no real discussion of affect).
5. Where discussion of affect, if any, occurred (title, abstract, text).
6. Whether supporting citations were provided for any discussion of affect.

Categories were clarified through discussion after initial analysis of a pilot sample, and content analyses were conducted by all three authors. In addition, 25% of each coder’s sample was re-coded for those variables where any subjectivity was possible (article type, author affiliation, treatment of affect) and analyzed for inter-coder reliability. Cohen’s kappa was calculated as 0.657 for article type, 0.786 for author affiliation, and 0.781 for treatment of affect. A consistency of 65% or greater is considered acceptable, which was achieved for all these variables (Bakeman & Gottman, 1997).

4. Results

Most articles in the sample were reports of empirical research. The proportions of various article types were as follows:

- Empirical research, 56.2%;
- Mathematical modeling, 10.7%;
- Verbal argumentation, 9.9%;
- Literature review, 7.0%;
- Method paper, 6.2%;
- Theory paper, 5.4%; and
- Descriptive, 4.5%.

Most authors in the sample are academics (84.3%, \( n = 204 \)), while 11.6% (\( n = 28 \)) are professionals, and 1.2% (\( n = 3 \)) are others or their affiliation was not discernable.

Where papers included some treatment of affect, analysis of indexing descriptors revealed that none would provide a searcher with access to those aspects of the literature. In no instances were there any descriptors applied that might assist a searcher with interest in affective issues to find any treatment of these issues among this set of systems articles. LL applied the index term “user needs” to articles categorized as treating affect as a major theme. The only vaguely related indexing terms applied by LISA were “user needs,” “user satisfaction,” and “user profiles”; it is unlikely that a searcher seeking literature related to affective issues would consider any of these terms suitable for the task. Even where affect was a major theme or topic of a systems paper [e.g., #221], intellectual access to that aspect of the work was not provided as the affective aspects were noted only in the text of the article, and not in the title or abstract. Since LL did not include that paper in full-text form, a search for the term “affect” would not retrieve the paper. In another instance, LISA had misspelled the surname of an author of a paper with minimal attention to affect, thus blocking access by a searcher hoping to gather the work of a single author who has some concern for these issues. In other instances, particular feature articles from the sampling frame would not be indexed in either database, for no discernable reason.
Finally, LL was found, on occasion, to index stop words such as “the” and “and,” for unimaginable reasons.

The handful of papers in our sample that could be classified as dealing with affective issues as a “major theme” (5.0%, $n = 12$) included an interesting range of topics. One paper proposed a communication model that included affect and discussed affective complexity and the role of trust in communication. In another paper, the role and impact of trust was related to user interfaces, autonomous agents, and information systems. An additional article discussed how social defenses, particularly avoidance of stress and anxiety, are the reasons information systems generally fail. Another paper looked at motivation in terms of understanding human information behavior; its main theme related to fostering user acceptance of computer and information technologies. A model of network competence that includes five major factors, including affective factors such as anxiety, was presented in a different paper. Another article discussed the relationship of anxiety and fear of failure with Web searching. A paper dealing with searching behavior concluded that affect is “a mild influential factor in the reasoning process of these participants...” In our data, participants seemed not handicapped by their mild emotions, but more likely to use them as another filter or lens through which to view information, advancing their reasoning.\[221]\ In another study, Internet searching was characterized by participants in terms of frustration, a need to return to a secure home base, a need for professional help, impatience, anger, helplessness, being lost, fear, and confidence. Surprisingly, even with these reported results, the author concludes with recommendations for support for these searchers that focus on technical aspects only.

Within the sample, 11.2% ($n = 27$) of papers could be categorized as treating affect with “minimal” discussion. These articles made passing reference to the need to emotionally engage users in interface design, for example. Others considered topics obviously related to affect, without acknowledging that this was the case: for instance, noting that “negative personal attributions” \[247] influence information seeking. Still other authors in this category dismissed affective issues by characterizing Web use for entertainment purposes as suggestive of a lack of motivation, for example, thus minimizing the importance of affect in this kind of search behavior. Others briefly mentioned the role of generalized “feelings,” confidence, trustworthiness, or motivation in information use but offered no discussion of those factors. One author noted that frustration plays a role in information behavior but very narrowly defined relevant factors in search environments: “Two dimensions of the search environment affect a user’s [relevance] decision: the user’s knowledge, and the configuration of the information retrieval system” \[259]. Does this researcher really believe that situation, context, or affect has no role to play in people’s search behavior? Indeed, the strong focus on cognitive factors alone as representative of all relevant ‘individual differences’ in information-seeking behavior was very much apparent in the sample. Even when affective issues were supposedly included in a study, they were often utterly overlooked in results and discussion sections of papers. For example, one study in this category asked study participants to identify “words or phrases that describe how the

\[1\] Although some quotations are used from the sample papers, no citations are provided, in order to protect the anonymity of authors. Instead, the identification number we assigned to that paper is provided.
image makes you feel,” [#111] but the results of that question were not presented. Interestingly, that author argued generally that the development of Internet search engines should involve “professionals in other areas—human factors, psychology, sociology, and cognitive science, for example” [#111].

Those papers that gave “peripheral” attention to affective issues constituted a mere 3.3% ($n = 8$) of the sample. This group of articles explicitly acknowledged affective issues but did not deal with them in any serious manner. For example, one paper included user affect as part of a subjective satisfaction questionnaire about Web book design yet offered very little discussion nor any design recommendations based on affect-related findings. Another paper related that study participants made comments relating to affect about their Web searching experiences, yet there was no discussion in the paper about the implications of those comments. A third example included discussion of affect in the literature search, but no affect-related results were reported; the only reported results of this video-observation study were number of clicks, number of words in search strings, and other more “objective” aspects of searching behavior. Nevertheless, this author concluded that “this study empirically extends previous research that shows academic, affective and behavior differences between grade-six boys and girls working in same-sex groups for a Web-based class project” [#167].

Further analyses included a chi-square test that examined the relationship between ‘article type’ and ‘treatment’, which was statistically significant at $P < 0.05$ ($\chi^2 = 35.9$, Cramer’s $V = 0.223$). In particular, there was “minimal” discussion of affect in significantly more articles classified as “literature review” than would be expected.

In cases where there was some treatment of affect, whether “minimal,” “peripheral,” or as a “major theme,” evidence for that treatment was often not available by reading an article title or abstract. Most often, one would have to read through the text of an article to find mention or discussion of affective issues: of the 47 articles in the sample that included some consideration of affect, 8.5% ($n = 4$) mentioned affect in the article title, 27.6% ($n = 13$) mentioned affect in the abstract, and 97.9% ($n = 46$) mentioned affect in the text of the article. Surprisingly, only 70.2% ($n = 33$) of articles that included some treatment of affect provided at least one citation to support that discussion.

5. Discussion

Affective issues continue to receive minimal attention from authors of systems-related work in LIS. Even when affective variables are included in research studies, these frequently do not merit attention at the point of presentation of results or discussion, nor are practical searching recommendations relying on issues of affect. Although most authors of the articles in the sample are academics who presumably have access to the user-centered literature, that research appears to have had little effect on their systems-centered work. The result of the analysis of the relationship between article type and treatment suggests that affect may be starting to be recognized as a relevant variable in systems work. However, examining the publication year of those articles mentioning affect to at least some degree revealed no discernable trend of increased attention to affect.
In LIS there appears to be a tendency to shy away from including affect as a variable in systems work, from treating affect as important to the outcomes of systems research, and from recognizing the implications that affect may have. From the results of these analyses, it seems that the top journals examined are not encouraging the publication of systems-related work that addresses the full range of issues relevant to that area but are publishing papers with a relatively narrow scope of concerns. At minimum, these journals generally are not publishing items of cutting edge importance in the systems area, at least in terms of affective issues.

Intellectual access to affective considerations in systems literature is also being compromised, both by authors who fail to include mention of affect in their article titles or abstracts, and by the primary indexing services, Library and Information Science Literature Full-Text, and Library and Information Science Abstracts. These databases do not provide intellectual access to the small body of systems-related work that addresses issues of affect. The controlled vocabulary applied to systems work that does consider affective issues is inadequate. Indexing terms such as “user needs-emotional aspects,” “user needs-motivation,” or “information seeking-affective aspects” would go much farther to provide appropriate subject access to these topics. The deficiencies found in LL and LISA echo those of McKechnie et al. (2002), who discovered that these indexing services also are not providing intellectual access to methodological issues. These findings raise serious concerns about the primary indexing services that provide intellectual access to LIS literature. It seems particularly ironic that the discipline of LIS, with its central focus on providing intellectual access to information, would be so poorly served.

6. Conclusion

LIS has contributed much to the study of human information behavior; the leading journals of the field should encourage publication of systems work that moves beyond a focus on system technicalities or cognitive aspects of searching behavior. Despite some exceptions, noted in the Section 1, this study shows that most LIS systems work, at least that which is being published in the field’s most influential journals, continues to ignore affective issues. The research front in systems work outside of the discipline is moving in fascinating new directions in a number of areas, offering intriguing, but as yet unfulfilled, potential for similar work in LIS.

References


