

Where to from here? Results of an empirical study and user-centred implications for system design

Heidi Julien

School of Library and Information Studies, Dalhousie University, Halifax, Nova Scotia, Canada B3H 3J5

slis@is.dal.ca

INTRODUCTION

For some time now, we investigators into information behaviour have congratulated ourselves on our 'user-centred' approach to research. We claim that we have considered the user and her needs apart from information systems or services, and have stimulated development of those systems or services on the basis of user studies. I wonder, however, if it is time for a sober assessment of our real contributions.

Who are 'users'?

A good place to start is with the labels we use. A well-argued condemnation of our utilization of the word 'user' was recently published by Tuominen (1997). We typically construct 'users' as bungling fools whose affective responses are at best only an annoying interference with effective application of cognitive skills to information retrieval, but which, at worst, are the primary barriers to effective information retrieval (Tuominen, 1997). We conceive of users of information systems as 'children' or 'patients' whose symptoms require diagnosis. We construct ourselves (i.e., those who deliver information services) as the experts who have the solutions and can help 'users' to use our solutions. When we construct our positions as experts and our clients' positions as novices who require help, we set up an unequal power relationship. In Western societies, accepting help has connotations for the recipient of "inferiority, dependency, and inadequacy" (Nadler, 1990: 129). However, we rarely ask ourselves or information seekers whether 'our' solutions are what is needed. A classic example of this 'expert', and ultimately systems-centered, attitude is apparent in Allen's (1996) discussion of research showing the value of social networks in

meeting a need for parenting information. He states: "The clear implication is that the social network of friends and family acts either to diminish the perceived need for information or to decrease the incentive people have to obtain information about parenting" (p. 39). What is not admitted is that whatever the needs of the research participants were, these were met by their social networks. Allen (1996) also describes users as having perceptual "failures", or "inadequate" knowledge structures, or "inappropriate or ambiguous social signals" (p. 109). He complains that people "interact with their environment by limiting their intake of information, ignoring information if it is associated with negative outcomes, and taking information shortcuts" (p. 109). In all instances, the terminology selected acts to construct users as somehow deficient or inadequate.

Somewhat ironically, it is also apparent that our definition of 'user' continues to be relatively elitist. Indeed, the term 'user' itself suggests that the focus of our interest is in people who make use of some existing information service or system, effectively excluding from consideration the information behaviour of those who choose not to access formal information services or systems. Research still tends to focus on the high-status user, as we tend to focus on a restricted range of information needs, largely in terms of specific data and documents required by elite users. For example, a cursory analysis of the program for this conference reveals that of 14 reports of user studies where the participant group is readily identifiable from the presentation title, 8 focus on high-status groups (e.g., medical practitioners, business school students), and 6 on relatively low-status groups (e.g., adolescents, public library users). A recent content analysis of research into information needs and uses demonstrated that the identifiable group studied most frequently in information needs and uses research is scholars (Julien, 1996). Naturally, our preoccupations only reflect social power structures and subsequent interest on the part of research funding bodies. My question is: who are we seeking to provide information services for; whose needs are we seeking to meet? It seems that the range of services upon which our research focuses remains relatively confined.

AFFECTIVE ASPECTS OF INFORMATION BEHAVIOUR

Beyond fundamental questions of whose information needs we define as worthy of study, another serious indictment of our so-called 'user-oriented' approach is our relative neglect of affective aspects of information behaviour. We have generally insisted on rational, cognitive models of information seeking, processing, and use, and paid little attention to the affective aspects of information behaviour. Search behaviour is demonstrably opportunistic. It is not linear, nor 'logical', and seldom 'expert' (Hendry & Harper, 1997, 1036). At a very basic level, we have erred in conceiving of cognition as separate from

affect. Indeed, I can see that in my own research, I have erroneously dichotomized affect and cognition. This mistake is ironic, considering that my research on adolescent decision-making demonstrates quite clearly that affective and rational behaviour cannot be polarized (Julien 1997). Indeed, the interrelationship between affective and rational aspects of cognition and behaviour continues to be debated within psychology (Fiske & Taylor, 1991, 10).

Defining affect

What do we mean by 'affect'? At a basic level, we can differentiate between affect, preferences, evaluations, moods, and emotions. 'Affect' generically describes all these concepts. 'Preferences' refer to subjective reactions, and are described on a scale of 'unpleasant' to 'pleasant'. 'Evaluations' are straightforward reactions to other people, material objects, or experiences. 'Moods' are less specific, and not directed towards specific external persons or objects. 'Emotion' is a concept that includes the broad range of affects, and includes all the fine gradations of feeling that humans identify (Fiske & Taylor, 1991). Within information science, affect has been defined as "the continuous motivational energy provided by one's intent, goal, purpose, use, as well as the emotional dynamic features that determine the quality of the search process; e.g. perseverance, preferences for move types, paying attention to detail, frustration, hope, disappointment, excitement, disbelief, etc. The affective domain pulls together into one powerful category the entire motivational and emotional involvement of searchers" (Nahl & Tenopir, 1996, p. 277).

Where is the evidence for the role of affect in information behaviour?

To recognize the role of affective factors in information behaviour, we need not look far afield. Transcripts from interviews with thirty adolescents that focused on their information behaviour as they made career decisions revealed that adolescents rely to a large extent on affective considerations when making decisions in this context (Julien, 1997). Affective aspects of their experiences with information sources heavily influence their judgements of the usefulness of their interactions with both formal and informal sources.

Initially, the adolescents' perceptions of the context of their information needs were heavily influenced by their emotions. Many adolescents do not understand what decisions they need to make about their futures, and have unclear notions of an appropriate process of career decision-making. This lack of clarity leads many adolescents to feel anxious and overwhelmed by the decisions they face. Anxiety is more pronounced in earlier stages of decision-

making (such as during self-assessment) whereas self-confidence is more apparent later in the process. This shift in feelings parallels those described in Kuhlthau's ISP (Kuhlthau, 1991). During the decision-making process, adolescents rely on intuition, particularly at early stages. When seeking information, adolescents report that a source must be trusted to be helpful (or useful), and that the source must demonstrate concern for the affective needs of the help seeker. Adolescents seek emotional support from the sources to which they turn (as predicted by Harris & Dewdney, 1994), and value information provided in the context of an interpersonal relationship, in which the help seeker is given assurance that her or his need for information is taken seriously. Information providers who are suspect in terms of their motivations, reliability, or knowledge, or who are unable or unwilling to demonstrate emotional sensitivity as they provide help, are not found to be useful. Adolescents tend to use interpersonal sources of information when making career decisions, and a majority believes that a person is an ideal source of help. In particular, the feelings that can be expressed by a person and the feedback that personal sources provide in response to specific questions are the qualities that adolescents value. The results of this study strongly suggest that on-line resources should not replace access to knowledgeable and sensitive human advisors who can provide feedback and talk about feelings.

The significant affective aspects of information behaviour revealed in this study are consistent with many other research reports (Kuhlthau, 1991; Harris & Dewdney, 1994; Nahl, 1997). In addition, the role of affect in information searching competence has been demonstrated quite clearly (Jakobovits & Nahl-Jakobovits, 1990). At a basic level, "without affective support, cognitive skills are not acquired" (Jakobovits & Nahl-Jakobovits, 1990, 451). For example, secondary school students with higher self-confidence ratings score significantly higher on tests of knowledge of search terms, and Boolean logic (Nahl & Harada, 1996).

If we are to take greater account of affective aspects of information behaviour, we must pay attention to the psychology literature reporting studies into affect. For example, Bless & Fiedler (1995) examined the influence of mood (generally positive or generally negative) on information processing. Their results support previous research that "positive affect supports inferential processes based on internally generated information" (p. 774), while a negative mood facilitates the conservation of information. The possible practical implications of findings such as these for information providers are some way off, I suspect, although these data do suggest that overall mood state certainly influences the speed with which people generate inferences. More generally, positive moods motivate individuals to be more sociable, recall pleasant experiences, apply more positive judgements, and make decisions more quickly (Fiske & Taylor, 1991, 450).

Importance of human sources

Associated with affective elements of information behaviour is the role of interpersonal sources of information. The evidence is indisputable for people's insistence on human information sources in many contexts. Consistent with my own research demonstrating that finding (Julien 1997), is a recent study analyzing the information behaviour of 635 13-16 year old English adolescents. When asked about their preferred information sources for health concerns, 27% of the study participants named specific places (GP's surgery, dentists, opticians). Twenty-four percent named people (doctors, parents, friends), and 32% preferred written sources (leaflets, booklets, magazines). Only 9% preferred multi-media sources (TV, video, films) for health information, and first choice of that group was TV. Internet resources were used by only 3% of respondents. As the study author notes, "...this rejection is by young people who may well be the most computer liter[ate] section of society, [and] ...should indicate a warning on the appropriateness of channelling substantial amounts of health information via this source" (Rolinson, 1998, 5).

Even within workplaces, a strong preference for human information sources is apparent. Correia & Wilson (1997) found that managers used human sources for:

specific and detailed information that can help in clarifying ideas or implementing specific strategies. Most of the managers interviewed manifested clear preference for personal sources. The arguments provided to justify this preference range from the greater reliability of the personal sources, to their role as the shortest way to the information needed or the last resource to get information that they could not find anywhere else. Finally some comments seem to point to the role of impersonal sources as a route to personal sources, which emerge as the desirable target (Correia & Wilson, 1997, 8).

This finding is corroborated by others. Word of mouth has a very large role in managers' use and handling of information (Oppenheim, 1997, 242). In addition, it is well documented that people with strong social networks seek less information from formal sources than do those with less dense social networks (Birkel & Reppucci, 1983). A study of the information needs of battered women found that they turn most frequently for help to friends and family (Harris, 1988). This finding is consistent with research in psychology that demonstrates that people seek help first from those with whom they are emotionally close (Nadler, 1990). Additionally, the continuing popularity of word of mouth is a direct result of people's need for social interaction: the need to establish, develop, and maintain social relationships. For example, analysis of questioning behaviour by novice searchers revealed that they asked for confirmation (an affective need) more than any other type of question (Nahl & Tenopir, 1996). These researchers suggest that affective types of questions are used by searchers

to cope with 'search stress' (p. 283) and to interact socially. Wilson (1995b) advises that when we consider a broad perspective of information behaviour, the importance of oral communication cannot be over-emphasized. The need for social interaction is very much related to the importance of affective aspects of information and communication behaviour. Thus, our de-emphasis of face-to-face interaction when we privilege formal, device-oriented information sources, is contradictory to all we know about the critical importance of social relationships, and about the role of non-verbal communication, such as body language and facial expression, in face-to-face interactions (Picard, 1997).

IMPLICATIONS FOR SYSTEMS DESIGN

The two major issues raised, then, are how to incorporate 1) affective elements into information systems design, and 2) design information services that recognize the importance of interpersonal information sources. One recent contribution to information systems design unfortunately typifies our reluctance to tackle these issues within the so-called 'user-centered' approach (Allen 1996). For example, although Allen insists that his definition of an information system includes intermediaries (Allen, 1996, 19), he still assumes that a 'device' is what is needed to meet information needs (Allen, 1996, 16). He assumes that 'users' know their needs, have search goals, and can define their purposes. His conception of user-centered design assumes that users have 'information' problems, that they recognize that they need information, that their searches for information are purposive, and that affective concerns are not part of this cognitive perspective. Allen (1996) insists on focussing only on information systems that assume rationality on the part of users, despite citing research that demonstrates that a "rational model, which assumes that people will want to reduce their uncertainty in social situations, fail[s] to predict information seeking" (Allen, 1996, 65), and that in general much information behaviour is not rational (Allen, 1996, 69). Allen's decision to ignore affective aspects of information behaviour is curious, as he demonstrates a recognition that affective elements influence information behaviour. For example, he notes that affective aspects play a role in health information seeking or consumer information needs, but he then chooses to ignore those elements when talking about appropriate design of information systems. To give credit where due, Allen does allow that his information system or device can be linked with "human experts who can provide advice" (Allen, 1996, 221) in order to facilitate evaluation of alternatives. Allen also allows that intermediaries have a role in dealing "sensitively with both the affective and cognitive" aspects of their interactions with users (Allen, 1996, 254).

A key issue is that currently we understand relatively little about those aspects of information behaviour that we label "affective". At best we

acknowledge people's anxieties or social needs (and then ignore them), but at worst we pretend they do not exist in the first place, and subsequently focus narrowly on the instrumental aspects of information design. I suspect that part of why we prefer to ignore affect is that it interferes with our concept of information as a "thing", and with our application of a conduit metaphor to conceptualize information transfer. This metaphor objectifies information, decontextualizes it, and turns it into something that accountants can quantify. Such a construction of 'information' is highly reductionist, and separates information artificially from its use and the meanings that people construct (Tsoukas, 1997). For the most part, we continue to research information behaviour assuming that our existing information systems are at least partly useful and effective, that in order to maximize effectiveness, information seekers need only to be adequately trained in their use, and that any aspect of seekers' interaction with our systems which 'interferes' with our conceptualization of appropriate interaction must be overcome. Even defining 'effective use' is difficult. What is 'effective use'? From our position as 'experts', do we allow that effective information solutions may originate solely from a person's quiet contemplation? From a conversation with a friend? From a conversation with a stranger, better acquainted with or experienced in a matter that concerns us? Do we recognize the degree to which the application of information systems has been socially constructed? For example, a recent study demonstrates how advertisements for information systems construct notions of the appropriate use and application of such systems (Dilevko & Harris, 1997).

The 'affect-imperative' seems finally to be noticed in the computing world (Picard, 1997). This book argues that we must recognize the role of emotion in perception, and incorporate 'emotional competencies' into computers; perhaps to program computers to recognize a user's emotional state, and to include sophisticated emotional content in computer communications. "Affective computers equipped with cameras, microphones, physiological sensors, and sophisticated pattern recognition tools, can begin to recognize physiological components of emotion, and to infer the likely emotional state underlying these components" (Picard, 1997, 30). She suggests that sophisticated applications could "involve recognition of user affect, reasoning with emotional cues, and understanding how to intelligently respond given the user's situation" (Picard, 1997, 111). One example she proposes is to design software that takes note of the user's frustration or stress levels, and then offers assistance specific to the user's needs at that point in time (Picard, 1997, 91). Significantly, the author makes the following point: "Human-computer interaction cannot perfectly substitute for human-human interaction or human-pet interaction [cf. Tamagotchis], but it can nicely augment both" (Picard, 1997, 110). Indeed, she also says that "AI has ignored a crucial component that is even more basic [than pattern recognition, learning, and reasoning] to human problem-solving abilities:

the use of feelings and intuition to guide reasoning and decision making" (Picard, 1997, 218). Computers today are effective decision makers only if "given precisely stated criteria, constraints, and a specific space to search." (Picard, 1997, 221). Picard's call for attention to affective aspects of human information behaviour appears promising, although she, like Allen (1996), continues to emphasize the role of information 'devices'.

WHERE DO WE GO FROM HERE?

It would be immensely satisfying to propose confidently that we embark on a new age of training information professionals in counselling psychology, that we establish information systems that facilitate access to face-to-face expert human advice, that we endeavour to demonstrate the trustworthiness of our information sources, that we magically fund information services to provide individual, in-person service for every client. However, the pragmatic view recognizes that funds are scarce. That there will be logistical reasons why we can not fit counseling psychology into an information management curriculum. And perhaps the biggest barrier is the powerful technology and information industry that has made huge investments in very specific technologies, and which will continue to spend millions to convince us that we need yet another on-line database instead of another staff position. There is no doubt that efforts toward disintermediation, while hyped as liberating, also promise expanded markets for hardware, software, and internet service providers.

Device-centred or not, there are promising paths to follow. Information seeking environments should encourage discussion of the search with colleagues or clients to encourage sharing of the learning experience (Hendry & Harper, 1997, 1037). In organizational contexts, instead of abandoning meetings as time-wasters, information service providers should capitalize on the popularity of face-to-face meetings to disseminate information (Wilson, 1995a). We can also incorporate affective learning objectives when teaching information skills. That is, people can be taught to value information services, and to be unafraid of information services and systems. They can be encouraged to gain experience and confidence in their information behaviour, and they can be encouraged to feel self-efficacious about their information seeking. Learning theory that emphasizes affective elements can be used to improve use of existing information systems, through application of motivational and reinforcement techniques (Nahl-Jakobovits & Jakobovits, 1990). Nahl-Jakobovits & Jakobovits (1993) provide a list of affective skills that information seekers can be taught to increase their success in the use of information systems. Information service providers must make affective contact with searchers (i.e. mutually expressing feelings about the search environment), demonstrate positive concern for searchers, and seek empathetic understanding (Nahl, 1997,

5). Kuhlthau, too, has demonstrated how we can help information seekers to become aware of their affective responses to the information search process, and to recognize those feelings as normal. She also demonstrates the importance of continued engagement between information providers and information seekers, in a process of guidance (Kuhlthau, 1993).

CONCLUSION

These are only a few recommendations that arise from truly 'user-centered' research. Will future inquiry into information behaviour consider more carefully the ways in which 'users' and their information needs are constructed? Will we promote information system and information service designs to meet those needs in helpful ways? Will we ask ourselves how long and to what extent we are prepared to act as apologists for information services that are mismatched with what information seekers prefer or find most useful in many contexts? There is a strong argument for advocating increases in people's socio-political power through effective use of information channels, but are these channels necessarily those that we investigate and promote? These are questions we cannot afford to ignore.

REFERENCES

- ALLEN, B.L. (1996). *Information Tasks: Toward a User-Centered Approach to Information Systems*. San Diego: Academic Press.
- BIRKEL, R.C., & REPPUCCI, N.D. (1983). Social networks, information-seeking, and the utilization of services. *American Journal of Community Psychology*, 11, 185-205.
- BLESS, H. & FIELDER, K. (1995). Affective states and the influence of activated general knowledge. *Personality and Social Psychology Bulletin*, 21, 766-778.
- CORREIA, Z. & WILSON, T.D. (1997). *Scanning the business environment for information: a grounded theory approach*. (<http://www.shef.ac.uk/~is/publications/infres/paper21.html>, 4/8/97).
- DILEVKO, J. & HARRIS, R.M. (1997). Information technology and social relations: portrayals of gender roles in high tech product advertisements. *Journal of the American Society for Information Science*, 48, 718-727.
- FISKE, S.T., & TAYLOR, S.E. (1991). *Social cognition*, 2nd ed. New York: McGraw-Hill, Inc.
- HARRIS, R.M. (1988). The information needs of battered women. *RQ*, 28 (Fall), 62-69.
- HARRIS, R.M., & DEWDNEY, P. (1994). *Barriers to information: how formal*

- help systems fail battered women*. Westport: Greenwood Press.
- HENDRY, D.G., & HARPER, D.J. (1997). An informal information-seeking environment. *Journal of the American Society for Information Science*, 48, 1036-1048.
- JAKOBOVITS, L.A. & NAHL-JAKOBOVITS, D. (1990). Measuring information searching competence. *College and Research Libraries*, 51, 448-462.
- JULIEN, H. (1996). A content analysis of the recent information needs and uses literature. *Library and Information Science Research*, 18, 53-65.
- JULIEN, H. (1997). *How does information help? the search for career-related information by adolescents.*, London, Ont.:University of Western Ontario. (Unpublished Ph.D. Thesis)
- KUHLTHAU, C.C. (1991). Inside the search process: information seeking from the user's perspective. *Journal of the American Society for Information Science*, 42, 361-371.
- KUHLTHAU, C.C. (1993). *Seeking meaning: a process approach to library and information services*. Norwood, NJ: Ablex.
- NADLER, A. (1990). Help-seeking behavior as a coping resource. In: M. Rosenbaum, ed. *Learned resourcefulness: on coping skills, self-control, and adaptive behavior*. New York: Springer, 127-161.
- NAHL, D. (1997). *An integrated theory of information behavior: taxonomic, psychodynamic, ethnomethodological*. (http://www2.hawaii.edu/~nahl/articles/integrated/integrated_ToC.html, 10/6/97).
- NAHL, D. & HARADA, V.H. (1996). Composing boolean search statements: self-confidence, concept analysis, search logic, and errors. *School Library Media Quarterly*, 24, 199-207.
- NAHL, D. & TENOPIR, C. (1996). Affective and cognitive searching behavior of novice end-users of a full-text database. *Journal of the American Society for Information Science*, 47, 276-286.
- NAHL-JAKOBOVITS, D. & JAKOBOVITS, L.A. (1993). Bibliographic instructional design for information literacy: integrating affective and cognitive objectives. *Research Strategies*, 11(2), 73-88.
- Nahl-Jakovovits, Diane, & Jakobovits, Leon A. (1990). Learning principles and the library environment. *Research Strategies*, 8(2), 74-81.
- OPPENHEIM, C. (1997). Managers' use and handling of information. *International Journal of Information Management*, 17, 239-248.
- PICARD, R.W. (1997). *Affective computing*. Cambridge, MA: MIT Press.
- ROLINSON, J. (1998). *Health information for the teenage years: what do they want to know?* (<http://www.shef.ac.uk/uni/academic/I-M/is/publications/infres/paper42.html>, 5/6/98).

TSOUKAS, H. (1997). *The tyranny of light: the temptations and the paradoxes of the information society*. Coventry: University of Warwick. (Warwick Business School Research Paper No. 257)

TUOMINEN, K. (1997). User-centered discourse: an analysis of the subject positions of the user and the librarian. *Library Quarterly*, 67, 350-371.

WILSON, T.D. & WALSH, C. (1996). *Information behaviour: an interdisciplinary perspective*. Sheffield: University of Sheffield, Department of Information Studies. (<http://www.shef.ac.uk/~is/publications/infbehav/prelims.html>, 8/6/98). (British Library Research and Innovation Centre Report No. 10.)

WILSON, T.D. (1995a). *Information-seeking Behaviour: Designing Information Systems to Meet our Clients' Needs*. (<http://www.shef.ac.uk/~is/lecturer/acuril.html>, 26/4/98).

WILSON, T.D. (1995b). *Modelling the Information User: The Wider Perspective*. A paper delivered at the INFOTECH '95 Conference, Kuala Lumpur, Malaysia, November 1995 (<http://www.shef.ac.uk/~is/lecturer/klpaper.html>, 26/4/98).