Judgments during information seeking: emerging themes from an exploratory study into the concept of enough information

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This paper reports on ongoing doctoral research into how, in an information-rich environment, workers assess they have enough information to complete the task at hand. While human information behaviour researchers are beginning to explore the concept of enough information, the subtleties that shape this assessment remain under-researched.

This exploratory research took a naturalistic orientation to investigate the phenomenon of enough information from a user perspective. The research was designed as a multiple case study, with semi-structured interviews the data gathering technique. A first interview explored the nature of the context in which participants worked. A second joint interview focused on how participants sought information and assessed they had enough. Research participants were public sector policy and research workers in Australia, engaged in real information seeking activity.

Inductive data analysis is being conducted and the paper reports on themes emerging from early analysis of the data. These themes include the paradoxical role of deadlines in assessing enough information and the strong contextual influences experienced by participants.

Introducing the research

The information environment today is characterised by abundance and each year, the amount of information available for searching grows (Lyman & Varian, 2003). However, this abundance of information represents a mixed blessing for workers. Initially confident the necessary information is somewhere to be found, individuals 'cease to pay prompt and careful attention' to information when overwhelmed by it (Case 2002, p. 98), with the consequence possibly 'a complete failure to meet task goals' (Case 2002, p. 100). How, in this information-rich environment, do workers assess they have enough information to complete the task at hand?

The experience of people looking for information has been mapped in a number of phases through the information search process (Kuhlthau 2004, p. 45), from the early stages of task initiation and topic selection through to information collection and search closure. But what initiates or stimulates a move from one phase to another? In particular, at the close of the information search process, moving from the collection of information to presentation in some form – how do people determine they have *enough information*?

Although information seekers make a number of assessments during the information search process, including, for example, the relevance of information found, the assessment of *enough information* has received little research attention to date. This paper reports on ongoing doctoral research aimed at developing a deeper understanding of the concept of *enough information*. The paper provides an overview of the research project to date, and includes a brief discussion of themes emerging from early analysis of data.

Framing the research – library and information science literature

This thesis research is framed by a theoretical perspective, which situates information behaviour in context. Since the emergence of a user-focused approach during the 1980s (e.g. Dervin & Nilan 1986; Wilson 2000), our understanding has grown of the many influences on information behaviour and of the complexity of the information search process (Kuhlthau 2004). The information search process presents people with a series of choices (Kuhlthau 2004), one of which is the choice between continuing their information seeking or stopping, that is, deciding whether to continue or stop.

Early studies on stopping behaviour

Stopping behaviour, that is, user termination of a search for information, was the focus of research during the 1970s and 1980s. Stopping behaviour was investigated in theoretical and experimental studies, usually framed within theories of optimal decision making and often with a particular focus on information retrieval from databases.

Examples include studies to identify rules used in the decision to stop the search (satiation, disgust, or a combination of the two: (Kraft & Lee 1979; Kraft & Waller 1981))and the application of Bayesian theory to calculate estimates of the probability of success in a sequential information retrieval search (Kantor 1987). Harrison (1999) investigated costs and benefits associated with information seeking and stopping, proposing a 'zone of cost-effectiveness' within which the decision is made to stop seeking. This concept of cost or effort expended for the return obtained from additional information was further explored through optimal foraging theory (Pirolli & Card 1995; Sandstrom 1994).

While these studies offered insights into the decision to stop seeking further information, the laboratory-based experiments and mathematic modelling were far removed from the real world context in which judgments and decisions are made (Case 2002; O'Reilly 1982). Because of this artificiality, these experimental and laboratory studies were unable to take into consideration the contextual factors, which influence behaviour, limiting their applicability to real world situations.

Investigating stopping behaviour from a naturalistic approach

More recent research has come at this problem from a different epistemological perspective, employing qualitative methods to draw out the complexities of contextual decision making in information seeking.

Two pieces of Kuhlthau's research looked at information seeking in the workplace, where participants used the criteria of 'task, interest, information available and time' to 'form a focus' (Kuhlthau 2004, p. 101) at the stage of search closure. Lawyers reported a 'sense of having constructed a persuasive strategy' (Kuhlthau 2004, p. 181), of being prepared to respond to anticipated questions and issues in the courtroom. The security analyst who participated in one of Kuhlthau's longitudinal studies was 'ready to present a report when he had developed an interpretation about a company that was somewhat different from that of other analysts' (Kuhlthau 2004, p. 175). In both these instances, the context in which the work product is to be used was a factor in determining search closure.

Limberg (1999), reporting on a study into the information seeking and learning of high school students, conceptualised the assessments of *enough information* made by her participants in terms of time constraints ('enough to cope with', no 'time or energy to go through more') and a personal investment in the quality of the assignment being completed ('enough material to answer their research question' or enough 'to analyse and discuss their topic in a comprehensive, in-depth manner).

Two recent studies (Agosto 2001; Zach 2002) drew explicitly on Simon's (1997) theories of bounded rationality and satisficing to understand what happens at the stage of search closure. Agosto (2001) found that time constraints and information overload as well as physical constraints limited the information searching activities of her subjects. Zach (2002) confirmed that senior arts administrators were satisficers in their information seeking, and concluded that comfort and time were two influences on their stopping behaviour.

In summary, the field of information seeking behaviour is beginning to explore from different perspectives the concept of *enough information.* However, the subtleties that shape that 'deceptively simple question' (Kuhlthau 2004, p. 199) of 'what is enough?' remain unclear and there is still much we need to understand about what contextual influences shape the judgment of *enough information*.

Framing the research – human judgment and decision making

Understanding that people face a series of choices throughout the information search process suggested the field of human judgment and decision making would offer insights into the nature of the phenomenon being studied and relationship between *enough information* and *information stopping*.

Judgment is 'the process of scaling, weighing, or comparing various alternatives or criteria' (Pitts 1999, p. 54), part of a 'multistage cognitive process' (Jungermann 2000, p. 587) with current research interest focusing on the assessment of alternatives – the judgment – rather than the selection from those alternatives – the decision. Judgment may be predictive or evaluative and, whereas predictive judgments are used in sequential decision making, evaluative judgments reflect personal preferences – and possibly, personal interaction with contextual factors (Hogarth 1980, p. 3).

Although Simon (1997) theorised about sequential decision making, his ideas on the inter-related constructs of satisficing, levels of aspiration and stopping criteria also offer insights into evaluative judgments. Satisficing behaviour sees an individual accepting a suitable alternative, which meets their purpose, rather than seeking the optimal outcome. Importantly, satisficing occurs against a pre-existing level of aspiration about potential outcomes (Simon 1997, p. 503). Our personal 'history is important because aspiration levels – the dividing line between good enough and not good enough – are not stable' but are shaped by experience and factors in the environment (March 1994, p. 22).

Framing the library and information science research against these insights into human judgment and decision making, we can position the earlier studies as investigations into the *decision* to stop searching, whereas the recent studies are more usefully seen as investigating the judgment of *enough information*, an input to the decision to stop, rather than a decision in itself. Importantly, both judgment and decision are influenced by experience and context.

Information behaviour research: implications for research design

Because the closing phase of the information search process has not received substantial research attention, the contextual influences on information seeking behaviour were also reviewed. This widening of scope revealed a rich vein of material, characterised by variety in theoretical approach (Vakkari 1997) and research focus (Fidel et al. 2004).To provide coherence to this rich and diverse research field, findings of empirical studies into the broader field of information behaviour (Wilson 1999) were mapped against Nardi and O'Day's

(1999) five-dimensional ecological framework, comprising the dimensions of people, practices, values, technology and the environment.

The strong research focus on the *people* dimension, observed by Fidel et al (2004), appeared in high relief. Studies which focused on the individual actor investigated, for example, the cognitive and affective factors influencing information seeking behaviour (e.g. Allen & Kim 2000), or the impact of personality, skills and experience (e.g. Heinström 2003; Sutcliffe, Ennis & Watkinson 2000). A second focus area is the *practices* dimension. Gathered within this dimension were factors such as role, work unit or organisational structure, with examples including the influence of the nature of work tasks (e.g. Bystrom & Jarvelin 1995; Vakkari 2002) and professional roles (e.g. Leckie, Pettigrew & Sylvain 1996).

Less intensively researched are the dimensions of values, technology and the external environment. Values was seen to incorporate both the workplace culture (the shared understanding of organisational norms and patterns) and the organisational climate produced by workers interacting in that culture, a new area of interest in library and information science research (Allen & Wilson 2003, p. 35). Nardi and O'Day (1999), understand technology as the tools used by people in local ecological settings for particular purposes. Information seeking in context scholars have tended to approach technology as a tool or a resource, studying how it is used or how it performs but paying less attention to how technology influences and is influenced by workers. The environment dimension included both organisational and external environments. Although Weick (2001, p. 184) noted the difficulty of empirically determining what lies outside or external to the individual within the organisation, since it is the individual who invokes the construct of an external environment, scholars such as Lamb et al (2003, p. 98) in their investigation into 'environmental aspects' have found it useful to differentiate between the organisation and its external environment.

This necessarily brief and selective overview of research into information behaviour highlighted the widespread recognition of the impact of contextual factors on the individual information seeker. There has been strong and lasting interest in cognitive matters, not surprisingly, given that information seeking is principally an intellectual process. More recently, the field has acknowledged the influence of affect, of task and role and of organisational factors such as culture and climate of the workplace.

Arising from the literature review, two issues in particular exercised my mind. Firstly, I felt that a holistic approach was needed for this exploratory research. Although much research into information seeking behaviour has focused on a small number of factors identified pre-study, variables exist on several dimensions, 'interact[ing] with one another' (Fidel & Pejtersen 2004, p. 939), suggesting a focus on just two or three may constrain a researcher's understanding of the phenomenon, or worse, mislead (Fidel & Pejtersen 2004, p. 950). A further compelling reason for a holistic approach is that this is how individuals themselves view the activity of information seeking (Kuhlthau 2004, p. 93). Secondly, given that most workers do not see information seeking as a discrete and immediately identifiable activity (Kuhlthau 2004; Solomon 1997), it was important to develop a research design and techniques that would help overcome the 'hidden' nature of information seeking at work.

Research design

The broad aim of the study articulated into the following research questions:

1. What do policy workers understand by the concept of *enough information*? What is important to policy workers when assessing *enough information*?
2. What different understandings and interpretations of *enough information* exist? How do policy workers formulate these conceptions?

3. What factors influence the formation of these understandings and interpretations of *enough information*?

Understanding a social phenomenon – in this case, how individual workers assess that they have enough information and decide to stop seeking more - required an interpretive approach that facilitated an in-depth analysis of the situation and people under investigation (Erlandson et al. 1993; Neuman 2003) and mandated a research design situated within the naturalistic paradigm (Lincoln & Guba 1985). In keeping with the naturalistic posture and the exploratory nature of the research questions, qualitative methods were seen as being most appropriate (Ezzy 2002; Morse & Richards 2002).

The research was designed as a multiple case study, an approach appropriate for exploratory, descriptive and interpretive studies (Lincoln & Guba 1985; Yin 2002) and when there are a large number of factors influencing what is happening, but it is unclear which are more important (Fidel 1992, p. 37). A case may be an individual or an organisation, a program or some 'event or entity [including] decisions' (Yin 2002, p. 23); in this study, the case was the judgment of enough information. Research participants were public sector policy workers in Australia. Policy workers were selected because they use information both as a resource (or input) and in the process of generating new information (an output) (Kirk 1999), thus providing an information-rich environment from which to draw data.

Semi-structured interviews were conducted, a technique appropriate for multiple case study (Yin 2002). Two interviews were conducted with each participant, the first individually and focusing on the role and nature of the work being done by participants. A modified critical incident technique (Patton 2002) was used to elicit information on information seeking. After Fidel and Green (2004), at the conclusion of the first interview, participants were asked to recall and re-tell a particular incident in which they carried out an information seeking activity. As well, the purpose of the second interview was explained and questions for the second interview asked, but not answered. The second interview was conducted in pairs and focused on participants' experiences of the end stages of information seeking and how they assessed they had enough information. Using joint interviews was a way to increase the richness of the data gathered, with the cross-stimulation expected to trigger thoughts and ideas about information behaviour in both participants. The joint interviews were chosen in preference to a focus group to reduce the likelihood of individual participants dominating the discussion. The purpose of these additional features of the research design was to increase awareness of and help participants 'reconstruct' (Fidel & Green 2004, p. 4) the information seeking incident as a way of overcoming the 'hidden' nature of information seeking at work.

In all, interviews were planned with 20 participants, giving 20 individual and 10 joint interviews. This paper reports on preliminary findings emerging from analysis of the first four full sets of interviews, which involved eight participants and a total of 12 interviews. The first, individual interviews have been between 20 and 30 minutes; the second paired interviews between 45 minutes and 1 hour 15 minutes. Members of this first group of participants were all experienced policy workers, with years of experience ranging from seven to 16 years, with one exception (two and a half years).

An inductive approach was taken to data analysis, in keeping with the naturalistic and interpretive nature of the research. A staged approach to analysis was planned, with data gathered in sets of interviews and preliminary analysis of transcripts conducted after each set. This flexible and iterative approach to this aspect of the research allowed the researcher to shape the interview guide as more was learnt about what was important to participants (Rubin & Rubin 1995, p. 43). A second benefit from this iterative approach is that it helped the novice researcher improve her interview technique. The interpretive approach means that no generalisations can be made from the findings. However, as the aim of naturalistic, interpretive research is to provide insights into the phenomenon under study, rather than generalisability (Lincoln & Guba 1985), this is not considered a limitation of the research.

Emerging themes

The following brief discussion was drawn from an initial review of the data and an early interpretive thematic analysis, conducted to inform the subsequent data collection. Data analysis and interpretation have not reached a point at which conclusive findings may be discussed and the comments that follow summarise several emerging themes.

Firstly, as anticipated and foreshadowed in the earlier discussion on the research design, participants found it difficult to distinguish the information seeking *subtask* from the broader work task (Bystrom & Hansen 2005). Participants spoke of the two interchangeably at times, confirming findings from a number of earlier empirical studies (e.g. Kuhlthau 2004; Solomon 1997).

Assessing enough information

Deadlines have been reported elsewhere as the reason people stop seeking more information (e.g. Agosto 2001; Limberg 1999). Certainly, deadlines drove these participants and did cause great stress – *'I was beside myself'* – *'I wanted to leave the country'*. Paradoxically however, the deadlines appeared less important in the assessment of *enough information*. The deadline was there and it had to be met, but sometimes, a less-that-complete product was submitted, a product, which did not have *enough information*:

> 'sometimes the briefings we send over aren't very good'.
>
> 'you find something a few days later and you think, 'gee, it would have been nice to have known about that'.

So while the deadline was part of nature of the business, whether or not the product contained *enough information* may be assessed independently of the deadline.

Influences on assessments of enough information

Participants were intensely aware of the context in which they operated, in particular those participants working in operational agencies. They were aware that the information they were gathering was to be used in high level decision making within government so the work they provided must be *'accurate and useful'*. They saw their job as making sure the Minister was prepared and able to handle the situation – to the extent that they sometimes felt as though they were writing as the Minister. This experience of themselves as individuals operating in and responding to a highly political environment confirmed the decision to focus attention on context during data gathering.

Participants were personally highly motivated, feeling a strong personal commitment to the work they did. Further they derived great satisfaction and a sense of achievement from their work. However, they reported different reasons for this satisfaction. Some participants derived satisfaction from in the way in which they're *'actually doing something for the community'*, whereas others reported the enjoyment and satisfaction came primarily from the intellectual nature of the work, the challenge of solving a puzzle and satisfying their inherent curiosity:

> 'I like to … create order out of chaos … so having information and doing something with it and getting something better out of the other end – I like that'

> ‘you get to explore something in depth … you can actually get in there and tease out these issues’

Despite the varying underlying causes, this feeling of satisfaction in the work suggests an intrinsic motivation is at work here, both in the broader task and in the information gathering task. This motivation may play a part in how participants determine they have *enough information*.

Concluding comments

Although the field of information behaviour is beginning to explore the concept of *enough information*, the subtleties that shape that assessment have not been studied in-depth. This paper has reported on ongoing doctoral research investigating the concept of *enough information* in the workplace. Preliminary analysis carried out during data gathering has revealed several emerging themes, some of which confirm findings from previous research into information seeking behaviour, such as the difficulty of separating information seeking activity from the work task in which it is embedded.

Findings from the completed study will expand our knowledge of people’s experience of the closing stages of the information search process in the workplace, for example, by teasing out the inter-relationship between stopping the search for information and the assessment of *enough information*. Although significant investments are being made in systems and processes to help managers and staff source, retrieve and use information, these investments do not always provide the expected returns (Eschenfelder, Heckman & Sawyer 1998; Walsham 1998). For organisations struggling under the weight of too much information, an increased understanding of the ways in which information seekers assess they have enough will contribute to more informed decisions on investments in managing information.

References

Agosto, D E 2001, ‘Bounded rationality and satisficing in young people’s web-based decision making’, *Journal of the American Society for Information Science and Technology*, vol. 53, no. 1, pp. 16-27.

Allen, B L & Kim, K S 2000, ‘Person and context in information seeking: interactions between cognitive and task variables’, in *New Review of Information Behaviour Research. [Proceedings of ISIC III: the Third International Conference on Research in Information Needs, Seeking and Use in Different Contexts, Goteborg]*, Taylor Graham, Cambridge, pp. 1-17.

Allen, D & Wilson, T D 2003, ‘Information overload: context and causes’, *The New Review of Information Behaviour Research*, vol. 4, pp. 31-44.

Bystrom, K & Hansen, P 2005, ‘Conceptual Framework for Tasks in Information Studies’, *Journal of the American Society for Information Science and Technology*, vol. 50, no. 10, pp. 1050-61.

Bystrom, K & Jarvelin, K 1995, ‘Task complexity affects information seeking and use’, *Information Processing and Management*, vol. 31, no. 2, pp. 97-113.

Case, D O 2002, *Looking for information: a survey of research on information seeking, needs, and behavior*, Academic Press, Amsterdam; New York.

Dervin, B & Nilan, M 1986, ‘Information needs and use’, *Annual Review of Information Science and Technology*, vol. 21, pp. 3-33.

Erlandson, D A, Harris, E L, Skipper, B L & Allen, S D 1993, *Doing Naturalistic Inquiry: A Guide to Methods*, Sage, Newbury Park, Ca.

Eschenfelder, K R, Heckman, R & Sawyer, S 1998, 'The distribution of computing: cooperation among technical specialists in a distributed computing environment', *Information Technology and People*, vol. 11, pp. 84-103.

Ezzy, D 2002, *Qualitative Analysis: Practice and innovation*, Allen and Unwin, Sydney.

Fidel, R 1992, 'The case study method: A case study', in J D Glazier & R R Powell (eds), *Qualitative Research in Information Management*, Libraries Unlimited, Englewood, Col., pp. 37-50.

Fidel, R & Green, M 2004, 'The many faces of *accessibility*: engineers' perception of information sources', *Information Processing & Management*, vol. 40, no. 3, pp. 563-81.

Fidel, R & Pejtersen, A M 2004, *From information behaviour research to the design of information systems: the cognitive work analysis framework*, Paper presented at the 5th International Conference on Information Seeking in Context, Dublin, September 2004.

Fidel, R, Pejtersen, A M, Cleal, B & Bruce, H 2004, 'A multidimensional approach to the study of human-information interaction: A case study of collaborative information retrieval', *Journal of the American Society for Information Science*, vol. 55, no. 11, pp. 939 - 53.

Harrison, E F 1999, *The Managerial Decision-Making Process*, 5th edn, Houghton Mifflin, Boston.

Heinström, J 2003, *Five personality dimensions and their influence on information behaviour*, Information Research, 2004, http://informationr.net/ir/9-1/paper165.html.

Hogarth, R M 1980, *Judgment and Choice*, 2nd edn, John Wiley, Chichester.

Jungermann, H 2000, 'The two camps on rationality', in T. Connolly, H. R. Arkes & K. R. Hammond (eds), *Judgment and Decision Making: an Interdisciplinary Reader*, 2nd edn, Cambridge University Press, Cambridge, pp. 575-91.

Kantor, P B 1987, 'A model for the stopping behaviour of users of online systems', *Journal of the American Society for Information Science and Technology*, vol. 38, pp. 211-4.

Kirk, J 1999, *Information in organisations: directions for information management*, Information Research, viewed 7 October 2003, http://informationr.net/ir/4-3/papers57.html.

Kraft, D H & Lee, T 1979, 'Stopping rules and their effect on expected search length', *Information Processing and Management*, vol. 15, no. 1, pp. 47-54.

Kraft, D H & Waller, W G 1981, 'A Bayesian approach to user stopping rules for information retrieval systems', *Information Processing and Management*, vol. 17, no. 6, pp. 349-60.

Kuhlthau, C C 2004, *Seeking Meaning: A process approach to library and information services*, 2nd edn, Libraries Unlimited, Westport, Ct.

Lamb, R, King, J L & Kling, R 2003, 'Informational environments: Organizational contexts of online information use', *Journal of the American Society for Information Science and Technology*, vol. 54, no. 2, pp. 97-114.

Leckie, G J, Pettigrew, K E & Sylvain, C 1996, 'Modeling the information seeking of professionals: A general model derived from research on engineers, health care professionals, and lawyers.' *Library Quarterly*, vol. 66, no. 2, pp. 161-93.

Limberg, L 1999, 'Experiencing information seeking and learning: a study of the interaction between two phenomena', *Information Research*, vol. 5, no. 1, http://informationr.net/ir/5-1/paper68.html.

Lincoln, Y S & Guba, E G 1985, *Naturalistic Inquiry*, Sage, Newbury Park.

Lyman, P & Varian, H R 2003, *How much information - 2003?*, School of Information Management and Systems, University of California at Berkeley, viewed 26 February 2004, http://www.sims.berkeley.edu/research/projects/how-much-info-2003/.

March, J G 1994, *A Primer on Decision Making: How Decisions Happen*, Free Press, New York.

Morse, J M & Richards, L 2002, *Readme First for a User's Guide to Qualitative Methods*, Sage, Thousand Oaks.

Naisbitt, J 1984, *Metatrends: Ten New Directions Transforming our Lives*, Warner, New York.

Nardi, B A & O'Day, V L 1999, *Information Ecologies: Using Technology with Heart*, MIT Press, Cambridge, Mass.

Neuman, W L 2003, *Social Research Methods: Qualitative and quantitative approaches*, 5th edn, Pearson Education, Boston.

O'Reilly, C A I 1982, 'Variation in decision makers' use of information sources: the impact of quality and accessibility of information', *Academy of Management Journal*, vol. 25, no. 4, pp. 756-71.

Patton, M Q 2002, *Qualitative Research and Evaluation Methods*, 3rd edn, Sage, Thousand Oaks, California.

Pirolli, P & Card, S 1995, *Information foraging in information access environments*, ACM, viewed 7 October 2003, http://acm.org/sigchi/chi95/Electronic/documnts/papers/ppp_bdy.htm.

Pitts, M G 1999, 'The use of evaluative stopping rules in information requirements determination: An empirical investigation of systems analyst behaviour', Unpublished doctoral dissertation, University of Maryland, Baltimore.

Rubin, H J & Rubin, I 1995, *Qualitative interviewing: the art of hearing data*, Sage, Thousand Oaks.

Sandstrom, P E 1994, 'An optimal foraging approach to information seeking and use', *Library Quarterly*, vol. 64, no. 4, pp. 414-49.

Simon, H A 1997, *Models of Bounded Rationality: Volume 3, Empirically Grounded Economic Reason*, MIT Press, Cambridge, Mass.

Solomon, P 1997, 'Information behaviour in sense making: a three year case study of work planning', in P Vakkari, R Savolainen & B Dervin (eds), *Information Seeking in Context: Proceedings of the International Conference on Research in Information Needs, Seeking and Use in Different Contexts, 14-16 August 1996, Tampere Finland*, Taylor Graham, London.

Sutcliffe, A G, Ennis, M & Watkinson, S J 2000, 'Empirical studies of end-user information searching', *Journal of the American Society for Information Science*, vol. 51, no. 13, pp. 1211-31.

Vakkari, P 1997, 'Information Seeking in Context: A challenging metatheory', in P Vakkari, R Savolainen & B Dervin (eds), *Information seeking in context : proceedings of an International Conference on Research in Information Needs, Seeking and Use in Different Contexts, 14-16 August, 1996, Tampere, Finland*, Taylor Graham, London.

Vakkari, P 2002, 'Task-based information seeking', *Annual Review of Information Science and Technology*, vol. 37, pp. 413-85.

Walsham, G 1998, ‘IT and changing professional identify: micro-studies and macro-theory’, *Journal of the American Society for Information Science and Technology 49*, vol. 49, pp. 39-65.

Weick, K E 2001, *Making Sense of the Organization*, Blackwell, Malden, MA.

Wilson, T D 1999, ‘Models in information behaviour research’, *Journal of Documentation*, vol. 55, no. 3, pp. 249-70.

Wilson, T D 2000, ‘Recent trends in user studies: action research and qualitative methods’, *Information Research*, vol. 5, no. 3, available at http://informationr.net/ir/5-3/paper76.html. Viewed 7 October 2003.

Yin, R K 2002, *Case Study Research: Design and methods*, 3rd edn, Sage, Newbury Park.

Zach, S E 2002, ‘When is ‘enough’ enough? an investigation into the information seeking and stopping behaviour of senior arts administrators’, Doctoral dissertation, University of Maryland, College Park, Maryland.