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AUTHOR Park, Betsy
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ABSTRACT

This investigation of information seeking behavior focuses on three behaviors: (1) how people gather information in academic or work environments; (2) the sources they use; and (3) how their behavior relates to the library and its resources. This paper provides a review of the literature on information seeking from 1981 to 1986, a report on a survey of the information seeking behavior of 25 graduate students in a course on educational research at Memphis State University (Tennessee), and reflections upon the implications of Perry's developmental stage theory for information seeking behavior. The survey instrument and a 30-item reference list are attached. (RP)

INFORMATION SEEKING BEHAVIOR:

AN INTRODUCTORY EXAMINATION

by

Betsy Park
Memphis State University
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INFORMATION SEEKING BEHAVIOR: AN INTRODUCTORY EXAMINATION

INTRODUCTION

How do people find the information they need to answer a question, make a decision, satisfy a need? Are there patterns to the behavior individuals exhibit in these situations? Are there identifiable sources which people use for information in our society? Can we identify factors which facilitate or hinder information seeking behavior. Can we identify variables that influence people to make certain decisions regarding information? These questions are of concern to those in the information industry, be they publisher, library, database producer, or bookseller. An understanding of the process involved in information seeking is important both for the design of information systems and for increasing our knowledge of human behavior in general. In the 1978 Annual Review of Information Science and Technology, Crawford (1978) estimated that there have been more than 1,000 published papers on user behavior and information use. Krikelas (1983) believes even this number to be conservative. Although there are numerous studies, they tend to be either descriptive or explanatory of a specific type of behavior. The plethora of studies has still not yielded a standard conceptual model against which other studies are measured.

REVIEW OF THE LITERATURE

CONCEPTS:

Information seeking behavior has been defined as that activity undertaken by an individual to identify a measure to satisfy a perceived information need. The

need is the perception of an ambiguity or uncertainty by an individual; information is that which satisfies the ambiguity or uncertainty . The information need serves as a stimulus to elicit the information seeking behavior (Krikekas, 1983; Fine, 1984). Inherent in the study of the research is the difficulty in defining "information" and/or "information seeking behavior". One can look for information in a variety of places and for a variety of reasons. Information seeking can be as complex as trying to comprehend Einstein's Theory of Relativity, or trying to locate the telephone number of the nearest Pizza Parlor. For purposes of this paper (and the sanity of all concerned) "information seeking behavior" will be limited to that which involves decision-making and is purposive, directed, problem-solving, analytical and creative (Evans, 1986). Forthis paper, the information sought will be oriented toward research or academic information; the information seeker will have a purposeful rather than a casual need for the information; the information seeking behavior will be directed rather than haphazard.

A number of studies concentrate on the nature of the information need. Voigt (1961) bases his model in the information need and the approaches to information. He studies and analyzes the information seeking behavior of scientists to assess the value of the various information-related activities and the bibliographic tools used. For the scientist a primary need is to keep up-to-date in a field, to be aware of what others have done and are doing both in a specific area and in the field in general. This need elicits the "current approach" which stresses behaviors such as talking to colleagues, reading professional journals regularly, attending conferences and seminars. Another need is to locate specific facts or bits of information, such as the answer to a scientific equation, the explanation of a research technique, or the interpretation of a theory. The

"everyday approach" is used to locate fairly specific information in response to a specific request. Behaviors include conversations with colleagues, consulting textbooks or journals; possibly also, using outside experts, or consulting library resources. Since much of the scientist's time is spent locating information in response to this need, efficiency and speed are important factors. The scientist usually consults the most direct and easily accessible source. The form of the source is unimportant, it may be oral (i.e. reports from others) or printed. The computer can simplify information retrieval and the personal computer makes access to information easier and more available. A third need is less frequent, but important, and is the need for all information on a specific topic. This need is often manifest at the beginning of the research process or in the publication phrase and forces an "exhaustive approach" to information. Although this need does not occur frequently, strategies to resolve it are extremely time consuming and necessitate a variety of information sources. Voigt's examination of information seeking behavior is task-oriented in that it emphasizes the importance of the information task to predict and understand the resulting behavior. He stresses that these approaches are not discrete; there is a good deal of overlap among the various approaches.

Krikelas (1983) also approaches information seeking behavior in order to study the relationship between information seeking and other information variables. According to Krikelas, a need may be either direct and immediate or continuous and deferred. The direct need triggers a specific information action, while satisfaction of a continuous and deferred need is an ongoing and less formalized process, closely resembling Voigt's "current approach" to information. Information giving, or the act of sending messages, is also part of Kirkelas' information model. He conceives of an information seeking behavior model in

which the individual's information gathering and information giving behaviors lead to an information need creating situation which in turn generates an information need. An immediate information need stimulates an action directed toward a preferred information source. This source can be characterized as being internal (such as, the individual's observations, memory, or personal files) or external (such as, direct interpersonal contact or the recorded literature). The information gathering behavior in response to a deferred need supplies the the internal sources of information (memory and personal files). Kirkelas' model is diagrammed in Figure 1 (see page 8). One problem with this model is that it is not cyclical except in the less formalized information gathering behavior. Information giving behavior stops abruptly when a source has been located. The model does not include source evaluation and does not allow for an individual to re-enter the model if a source does not satisfy the information need. This model has yet to be used as the basis of empirical study, but may be somewhat incomplete.

Paisley (1968) describes individuals as living in a number of information environments. The choice of information is more strongly affected by psychological and demographic variables than by the nature of the information need. Paisley stresses the systems within which the scientist works. Some of the systems (i.e. the work team) are very important in determining the use of information; others (e.g. the religious group) appear to be unimportant for an understanding of information behavior. Paisley conceptualizes these systems as a series of almost-concentric circles and including the following systems: the scientists' culture, the political system, the membership group, the reference group, the invisible college, the formal organization, the work team, the legal/economic system, the scientists' own head (as in his cognitive structure) and

the formal information system. Each of these systems has an effect upon the scientist's information seeking to the extent that it provides a framework within which seeking occurs and creates opportunities, motivations and rewards for information needs. The legal/economic system affects the flow of information through a copyright law, industrial secrecy, competitive research and development. Economic systems also directly influence the quanitity and quality of information that can be bought by other groups in the system. The interaction of these systems are important determinants in the scientist's information seeking behavior.

Mick et al (1980) describe information needs as being either applicational (direct) or nutritional (indirect). They use a systems approach to information seeking behavior and stress the interaction of variables on a task specific and a general level. Benavior on the general level involves situational, environmental, evaluational and satisfaction variables. On the task level, they specify a need, action and task satisfaction. They identify a correlation between levels for situation and environment, impacting upon need; and a relationship between general satisfaction and task satisfaction.

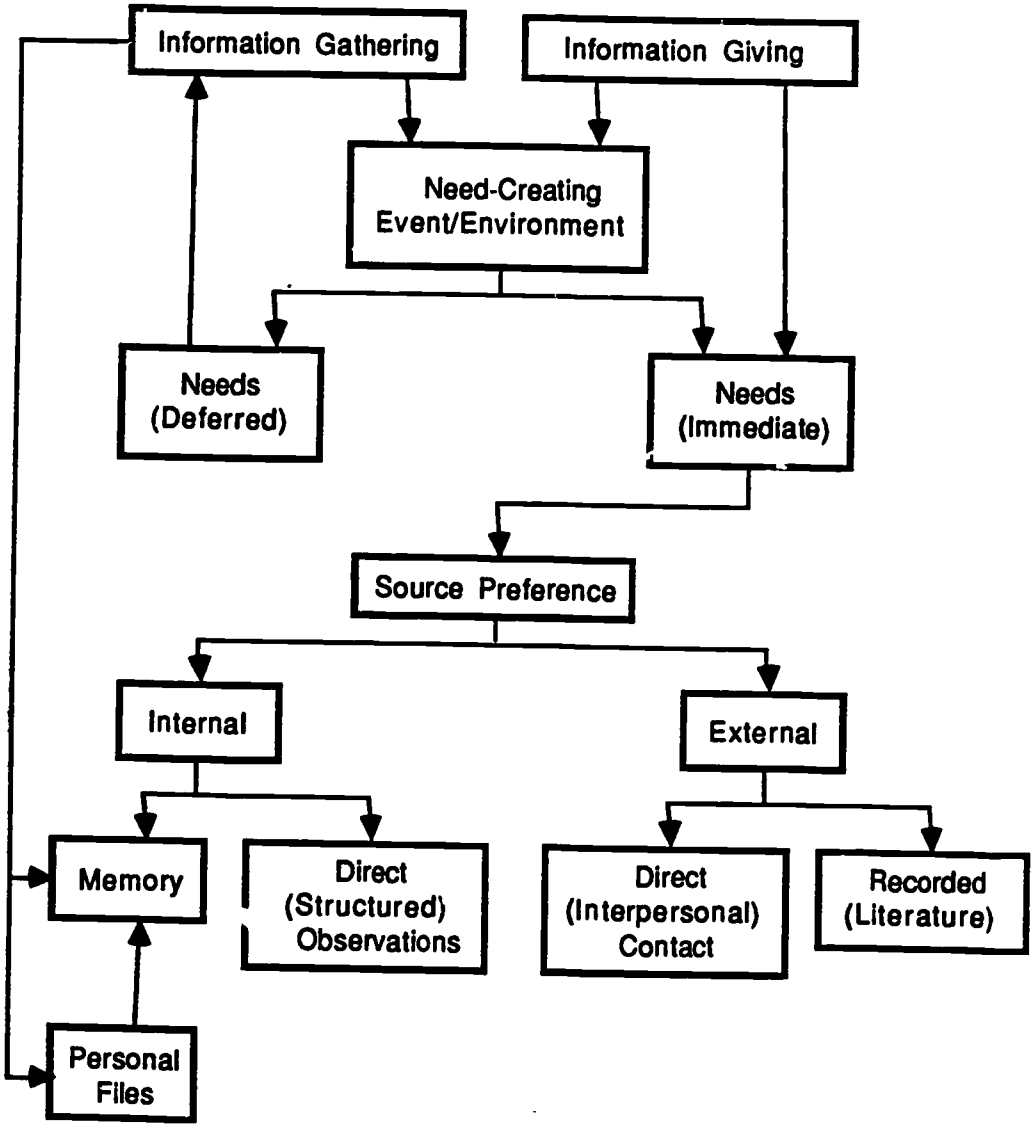

Figure 1. Information-Seeking Behavior

Source: Krikelas (1983)

Although there are a variety of models proposed, few have been used as the basis of empirical study. Mick et al have an interesting model in that it has been tested against data collected from a detailed questionnaire given to 560 research and corporate scientists and engineers. Results from this survey allowed

increased generalization of the model from the individual to the organizational level. Information seeking behavior resulted from a complex interaction among a variety of variables. The authors found relationships among predictive variables to be highly situation-specific. Attitudes toward management were particularly important. Some variables could be affected by changes in environment, while others by changes in job.

Wolek (1986) uses this model to investigate the use of information services and management support. This study examined the influence of management on the information practices of scientists and engineers engaged in research and development activities. There was statistical evidence to indicate that managerial support increased the use of information services. The most effective means was to encourage interpersonal contacts outside the organization and show personal interest in information services. This study lends support to the contention proposed by Mick et al (1980) that information seeking behavior is influenced by outside (in this case,managerial) factors. This seems to resemble not only Mick's model, but that proposed by Paisley's "work team" model.

VARIABLES IN INFORMATION SEEKING BEHAVIOR

There are many studies reporting on specific factors influencing information seeking behavior. Voigt (1980, p. 347) summarizes and categorizes these variables in the following table:

Individual attributes
- Demography
- Training and professional background
- Organizational role and function
- Attitudes related to work and profession
- Attitudes related to the value of information

Work environment attributes
- Organizational demography
- Work teams

Communication networks

Task attributes
Basic versus applied
Diffuseness of the task
Rate of obsolescence of information
Phase of the project
Criteria for satisfactory completion of the task

This grouping is a useful summary of the variables investigated to date. Much of the research focuses on one or another of these attributes. These is still a lack of research which might consolidate these attributes within one conceptual model.

Chen and Hermon (1982) interviewed 2,400 residents from six New England states. with regard to important job-related, consumer, housing and education situations in which information was sought. They examined barriers to information, ability to articulate information problems and level of satisfaction and then studied the relationship of these variables to situation, occupational category, the use of information providers, and the satisfaction with the information provided. They found that the most important sources of information were interpersonal and that people were not dissatisfied even with the least helpful interpersonal sources. Cost in money and time were important considerations in the choice of source.

Summers et al (1983) investigated the effect of personal, professional and psychological variables on the information seeking behavior of educators. They gathered data from educators (n=1078) on the following personal and professional characteristics: position, years of experience, sense of isolation, level of education, information dissemination activities and attitude toward information. These were then correlated with information behavior which was defined to include purposes, sources, characteristics of sources and problems in findings and using information. Educators rated 13 sources of information by frequency of use.

Analysis of variance indicated that attitude toward information, position and dissemination activities were important factors in the choice of information source. In addition responents rated 11 characteristics of information on the basis of importance. Attitude toward information was, again, the most important factor. These researchers conclude that there is no *one* determining factor, but that personal, professional and psychological attributes play varying roles in determining the information seeking behavior of the individual.

Jahoda and Bayer (1979) compared online information search requests from an academic and an industrial organization. They determined that there were differences in information behavior which could be attributed to type of organization, age, position of user, and time in the research process at which the search was conducted. Academic and older users tended to request more comprehensive searches, while industrial researchers were more interested in specific information. Searches which were done during the latter part of a research project tended to be more carefully planned than those performed early in the project.

Case, Borgman and Meadow (1986) report on the use of the Department of Energy's RECON online information system by energy researchers. They found that when performing their own searches researchers preferred very broad searches and were not bothered by irrelevant citations. Professional online searchers (those performing searches for others) have tended to stress the necessity of relevance and recall. This work suggests that online searchers may be overly restrictive, trying to limit their searches within narrow confines; whereas researchers find it more important to expand outside these bounds, with the suggestion that precision in online searches may not be the all-important factor.

Hardy (1982) examined two models of information seeking which emphasize the influence of the variable "cost" in the decision process. The "Cost/Benefit" model asserts that information choices are made on the basis of the expected costs and expected benefits of the source. The second model, the "Least-Effort Model", proposes that individuals base their selection on effort--choosing the source which requires the least-effort in terms of psychological and financial expenditure. Hardy criticizes both models because they do not take into consideration the value of other factors. These models suggest that individuals merely seek to minimize cost and do not consider the quality of the information source. He proposes an alternative weighted cost/benefit model whereby individuals assign different weights to these variables. Harding surveyed 968 Forest Service personnel on their information sources and factors influencing their choice of source. Statistical analysis showed cost to be twice as important as benefits in the choice of an information source. Subjects valued speed, ease of use and assessibility over quality, but considered all factors in their decision.

INFORMATION SOURCES:

Individuals seek information through a variety of sources. Identification of the sources may shed some light on the process involved. Salasin and Cedar (1985a) focus on the information behavior in an applied research/service delivery setting. Analysis of data from a questionnaire sent to mental health workers (n=1666) stressed the importance of interpersonal communication in the information cycle - 80% of the respondents included seeking information from colleagues within their own work unit and 85% of the respondents included colleagues outside the direct work unit. In further investigation a sociometric analysis was employed to more closely examine the effect of person-to-person

communication on the information seeking process (Salasin and Cedar 1985b). The authors found that certain individuals were identified as information providers and that these individuals were linked either directly or indirectly. They determined that the information seeking process is highly centralized, connected, and exhibits a great deal of homogeneity. There was a higher than expected interconnectedness between the information source and the respondents based on the professional role, type of organization and geographic region.

Barrom (1985) asked clinical psychologists to rate the importance of information sources on the choice of intervention techniques and theoretical orientation in clinical work. He found that the seemingly subjective sources, such as personal preference and discussion with colleagues, were rated as the most important, while supervision and research presentations were given the lowest rating.

There are a number of studies which describe how individuals and/or disciplines use information sources. Of particular interest to librarians is the extent to which individuals value and use the library as an information source. It is interesting to note that most studies place the library low on the list of information providers. Chen and Hernon (1982), in their survey found that only 17% of the respondents used a library to satisfy an information need. They consulted personal sources (such as their own experience and conversations with others) and books and periodicals with a high level of frequency.

In an academic setting, library use has been correlated with class level. Stoan (1984) reports on a study at Witchita State University indicating that library use increases with academic status; undergraduates use the library the least. A study of course syllabuses (Rambler 1982) at another university library gives further support to these figures: only 8% of the courses required much library use

and 63% required no use at all. This supports the belief (fear) that the library is not seen as an important information resource, even in an academic community.

Noting that faculty expectations are influential in stimulating or discouraging student use of library resources, Sellen and Jirouch (1984) distributed a questionnaire to faculty and students to determine if faculty expectation of student use coincided with actual use, and if distinctions could be made between level taught, college level and student class level. 100% of the responding faculty in the study expected students to use the library, while 19% of the students did not even perceive this expectation. Of greater importance is the fact that faculty expected students to use certain resources which students did not use. Faculty expected greater use of periodicals while students preferred to check out books and read only the most current issues of periodicals. This study indicated that there is clearly a difference in expectations and actions.

Thaxton (1982) found that faculty were vague in their expectations regarding students' library research, even stating that students should "know how to get everything". Thaxton surveyed graduate students in their use of specific reference sources in psychology. Students tended to depend on only a limited number of sources (i.e. Psychological Abstracts), when other sources might have better met their specific information need at the time.

A library use study by Whitlach (1983) concluded that there is a decline in the use of academic libraries which can be attributed both to an increase in the number of part-time students and faculty and to the increase in the number of students majoring in disciplines which traditionally have low library use. Ferid and others (1984) examined the use of library resources by PhD candidates in economics, English, history, geology, philosophy and physics at Syracuse University. Over 70% of the respondents stated that personal channels were

important in their information seeking behavior. Differences between disciplines did not appear in this study. There were differences in use which could be attributed to whether the student was in the coursework or dissertation phase of the program and whether the student was an international student.

Stieg (1981) reports on the information behavior of historians. This group does not appear to rely heavily on personal communication with colleagues, but used bibliographies and references in books and journals as a primary source for research. Respondents stated that they preferred using books and journals, but felt that formats such as microforms hindered access to information.

PROBLEMS IN INFORMATION TRANSFER

In order to locate information an individual must interact with an information system. An important component of this system is information transfer or dissemination. Lancaster (1982, p. 90) presents a model of information transfer which stresses the cyclical nature of the process. Information which has been produced, communicated and assimilated by the user community returns to be used as the basis for further research. Much information is communicated informally through conversations among colleagues. Other pieces of information are transmitted through more formal channels, such as conferences and publications in journals or books.

Many of the problems in locating information can be traced to the information transfer model. Haag (1984) identifies fourteen factors hindering the use of published information. These range from problems with the speed of publication, to the availability of the published information, to the search process of the researcher. Problems such as those identified by Haag have led other writers to propose strategies to locate elusive information. Bates (1984) concentrates on the

scientific communication and publication cycle and its implications for information retrieval. She maintains that the more one is aware of the cycle of information dissemination, the better one may access the information itself.

Selasin and Cedar (1985b), having examined the centrality, connectedness and homogeneity of information transfer and seeking, suggest that barriers to information access could be lessened by: 1) facilitating contacts between individuals, 2) involving individuals with a greater diversity of backgrounds, 3) increasing the use of individuals with authority and influence in a field, and 4) encouraging individuals to report important findings or accomplishments. Mechanisms useful to increasing the information flow would include brief summaries of findings, conferences or workshops, a formalized network of consultants, and others.

Chen and Hermon (1982) examined societal, institutional, physical, psychological and intellectual factors as barriers to information. They identified no statistically significant relationship between barriers to effective information seeking and demographic characteristics, or between either age level or geographic situs.

SURVEY OF STUDENTS AT MEMPHIS STATE

During Spring term 1986 a survey of 25 graduate students in two sections of the Introduction to Educational Research (EDRS 7521) class was performed on their information seeking behavior. The questionnaire was based largely upon that of Summers et al (1982). The sample was small (N=25) and not necessarily representative of the Memphis State University graduate student. Results should be interpreted only as descriptive of the group involved. (See Appendix I for the complete questionnaire.) The subjects were asked to rate on a four point scale

(1=low to 4=high) their frequency of use of various information sources, their attitude toward certain characteristics of information sources, and their use of specific resources in the library. Personal communication did not appear to play as important a role as might have been expected (Fig. 2). Conversations with colleagues did not play the important role with this population as might be expected from the literature, as it was split fairly evenly between those used it frequently as an information source and those who used it less frequently. Textbooks or books followed by professional journals and notes, files in the office were the most important sources of information. Sources which would lead the researcher to other sources, such as abstracts, bibliographies, footnotes in journals/books and computerized sources ranked low in usage.

	MEAN	RANKING
1. With what frequency do you use the following as sources of information?		
Textbooks or books	3.92	1
Professional journals	3.72	2
Notes, files in your office	3.28	3
Conversations with colleagues	2.72	4
Outside experts	2.68	5.5
Bookstores	2.68	5.5
Abstracts, bibliographies	2.32	7.5
Research and theses	2.32	7.5
Curriculum materials	2.24	9
Librarian	2.20	10
University/public libraries	2.08	11
Workshop, seminars	2.04	12
Conventions or meetings	2.00	13
Footnotes, bibliographies in books/articles	1.96	14
Computerized retrieval	1.44	15

Figure 2

If one examines the overall ratings of the importance of certain characteristics of information sources (Fig. 3), "authoritative, accurate, and objective" and "likely to have information needed" rate high, while "keeps you aware of new developments" and "complete and comprehensive" are at the bottom of the list.

2. How important are the following characteristics of information sources to you?	MEAN	RANKING
Authoritative, accurate and objective	3.80	1
Likely to have information needed	3.56	2.5
Easy to use	3.56	2.5
Free or inexpensive	3.52	4
Responsive to information problem	3.48	6
Near at hand and usually available	3.48	6
Leads to other sources	3.48	6
Variety of viewpoints or discussion	3.36	8
Access without involving others	3.32	9
Keeps you aware of new developments	3.24	10
Complete and comprehensive	2.80	11

Figure 3

When respondents were asked about specific sources in a library setting, respondents rated the card catalog and periodical indexes as high, while the librarian and online searching ranked last (Fig. 4).

	MEAN	RANKING
3. How frequently do you consult the following when at a public or university library?		
Card catalog	3.76	1
Periodical indexes	3.28	2
Reference books	3.00	3
Journal abstracting services	2.76	4
Librarian	2.60	5
Online bibliographic search services	1.88	6
Online catalog	1.72	7

Figure 4

The number of professional journals read regularly ranged from zero to six, with three or fewer journals accounting for 80% of the responses. Time spent reading professional books or journals ranged from zero to six hours, with 72% of the responses indicating three hours or less. Amount of time spent in seeking information ranged from zero to ten hours, with 40% of the answers being three hours or less. Time constraints were the most important barriers to information, mentioned by 92% of the respondents. Another 32% of the respondents rated their information seeking behavior as being "very successful", while 64% characterized themselves as being "somewhat successful".

All but one of the respondents stated that their primary purpose for seeking information was coursework. This may explain the behavior exhibited, even the lack of time spent in information seeking behavior. It is interesting to note that these responses do not correspond to models which emphasize interpersonal communication, attendance at meetings and conferences, use of footnotes and bibliographies in books or articles read, etc. It is also interesting to note that these students, all but three of whom worked full-time, did not value information

sources which would keep them current in their chosen field. Their behavior with regard to information emphasized the use of textbooks and sources regarded as authoritative. This may be more typical of the student than the professional. It might be interesting to survey these same students after they have completed their graduate education to determine if their behavior changes after coursework.

AN ATTEMPT TO RELATE INFORMATION SEEKING BEHAVIOR TO DEVELOPMENTAL THEORY

This last is speculative as there is little or nothing in the literature which helps direct thoughts in this respect. Perry's (1981) work in the area of cognitive and ethical development will be used as a basis. His work is most readily applicable to the study and teaching of information seeking behavior. Perry's developmental scheme proceeds through nine levels, beginning with the dualistic stage in which the individual perceives knowledge as an absolute, through successive stages of multiplicity, relativism, and commitment which are increasingly complex and multidimensional. Mellon (1982) has proposed using Perry's theories as a basis for determining appropriate problem-solving processes to present to various groups of students. Mellon is concerned with bibliographic instruction, with teaching library skills to students. In Mellon's view, since most college freshmen are at the dualistic stage of development, library instruction for them should be fairly straightforward, simple and uncomplicated. These students have less tolerance for alternative search strategies. As these students move toward the multiplistic stage and have had exposure to an increased number of authorities who hold valid but conflicting views, library instruction can become more complex. These students may be more receptive to alternative strategies and to more complex bibliographic research tools, such as abstracts.

Graduate students may have reached Perry's relativistic stage and be more interested in information strategies which are complex. They may be more prepared to accept the responsibility of defining their information need and investigating appropriate strategies. Mellon suggests that a greater understanding of the process, as defined by Perry, can help the librarian work better with the student.

One drawback to the Perry scheme is the lack of an easily applied diagnostic to determine the students' cognitive and ethical level. The instructor who interacts with a class over a period of time can develop an intuitive feel for the students' level. The librarian, however, typically visits a class only once and has little opportunity for continuous individual interaction. The librarian who works within this scheme should recognize that there is a large range of developmental levels within a single classroom; that cognitive development is not a function of age or grade. Mellon seems to suggest that the librarian take developmental theory into account but neglects the complexities involved.

Perry stresses the role of knowledge and learning as they challenge the individual to proceed from one developmental level to the next. Transition from one stage to another is possible when the individual perceives incongrueties within the current stage. These incongrueties may occur if the individual is exposed to different ideas, experiences, facts, situations. Movement occurs when an individual is no longer able to reconcile the discrepancies between what is known and what is perceived. The individual proceeds along the developmental schema by internalizing the perceived discrepancies and redefining his cognitive view to reconcile the discrepancies. This might be akin to the state of information need which stimulates information seeking behavior. Krikelas (1983, p. 7) states that:

> information seeking begins when someone perceives that the current state of possessed knowledge is less than that needed to deal with some issue (or problem). The process ends when the perception no longer exists.

Information seeking occurs when there is a cognitive discrepancy. Information cannot be equated with knowledge. Evans (1984) makes the following distinction between information and knowledge:

> Information is the fundamental unit of human expression of data, facts, concepts, or instructions in a formalized manner suitable for communication, interpretation , or processing by human or automated means; information is affected data, affected by the means of processing, the meaning and ordering of the information and by the known or shared conventions used in their representation. Knowledge is information that has been organized, structured, interpreted and analyzed.

Information can stimulate and aid the individual to organize, structure, interpret and analyze his view of the world. Perry entitles his chapter "Cognitive and Ethical Growth: The Making of Meaning". In a similar manner one might perceive that information becomes knowledge when it becomes meaning for the learner. Information, although not knowledge, precedes knowledge. For Perry an important goal of higher education lies in the individual's cognitive and ethical development. One means of promoting this growth may be to help the individual develop information seeking behaviors which encourage active growth. Lifelong learning (and lifelong development) may depend on the individual's skill in seeking appropriate information and interpreting and organizing it into personal knowledge. To the extent to which information seeking facilitates this learning, this skill may be of importance for the individual. Possibly institutions of higher learning should begin to teach information seeking rather than regarding it as a pattern which becomes habitual rather than questioned and learned.

CONCLUSION

There has been a great deal written about information seeking behavior, but there is little concensus as to a specific conceptual model. This presents difficulties for a deeper understanding of the process. It is possible that there are qualitatively and quantitatively better methods of locating information.

There appears to be a difference in students' approaches to information and those used by researchers and professionals. One concern here for those in higher education is how to help students "plug into" the prevalent information cycle they will encounter and presumably use after they finish their formal education. I would suggest that we have allowed information seeking to become a habit rather than a science. We need to further investigate this behavior, to develop a better understanding fo the processes involved, the effectiveness and appropriateness of specific behaviors, and to facilitate an interface between the learner and the information. Perry's work appears, at least to me, to strengthen the argument that access to information is important and strategies of information seeking warrent further study.

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APPENDIX I

SURVEY QUESTIONNAIRE (Sample = 25)

The purpose of this questionnaire is to gather data on the behaviors people employ when they are looking for information. The need for information may arise when you need to answer a question, solve a problem, or try to understand something.

Department: _____ Major: _____

Candidacy: Doctorate: 6 Masters: 19 Special: 0

Number of hours completed in graduate school: _____

Number of hours currently taking: _____

Do you work? No: 3

Yes: 19 Full-time: 19 Part-time: 3

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	low			high
1. With what frequency do you use the following as sources of information.				
Conversations with colleagues	3	9	5	8
Workshops, seminars	8	9	7	1
Notes, files in your office	0	2	14	9
Textbooks or books	0	1	9	15
Professional journals	1	2	9	13
Outside experts	4	8	10	3
Conventions or meetings	10	7	6	2
Computerized retrieval	17	6	1	1
Abstracts, bibliographies	4	11	8	2
Research and theses	4	11	8	2
Curriculum materials	4	5	12	4
University/public libraries	1	10	9	4
Bookstores	6	7	8	4
Footnotes, bibliographies in books/articles	7	14	2	2
Librarian	6	12	3	4

	low			high
2. How important are the following characteristics of information sources to you?				
Authoritative, accurate and objective	0	0	5	20
Likely to have information needed	0	1	9	15
Responsive to information problem	0	2	9	14
Near at hand and usually available	0	3	7	15
Complete and comprehensive	0	2	13	10
Keeps you aware of new developments	1	2	12	10
Easy to use	0	2	7	16
Variety of viewpoints or discussion	1	5	11	8
Leads to other sources	0	2	9	14
Access without involving others	1	2	10	12
Free or inexpensive	0	3	6	16
3. How frequently do you consult the following when at a public or university library?				
Card catalog	0	3	8	14
Online catalog	11	8	4	2
Reference books	4	2	9	10
Periodical indexes	2	3	6	14
Journal abstracting services	3	7	8	7
Online bibliographic search services	13	4	6	2
Librarian	3	9	8	5

4. What barriers do you perceive to locating and obtaining the information you need?	
Sources	10
Procedures	8
Time constraints	23
Financial constraints	8
Physical barriers	5

5. When do you most often have a need for information?
   At work 1 For coursework 24 For personal needs 1

6. How many professional journals do you read regularly? 0-6

7. On the average, how much time per week do you spend reading professional books or journals? 0-7

8. On the average, how much time per week do you spend seeking information? 0-10

9. In general, how successful do you think you are in satisfying your information needs?
   Very successful 32% Somewhat successful 64%
   Somewhat unsuccessful 4% Unsuccessful 0%