



## TRENDS IN . . . A CRITICAL REVIEW

### INFORMATION BEHAVIOUR: AN INTERDISCIPLINARY PERSPECTIVE\*

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**Abstract**—This paper reports on a recent review of the literature of “information behaviour” as it is studied in a variety of disciplines, other than information science. As a result of the review, areas of research interest to information science are identified and a general model of information behaviour is proposed. © 1997 Elsevier Science Ltd

#### 1. INTRODUCTION

The extent of the literature on information needs and information-seeking behaviour within the field of information science has been recorded on a number of occasions as extending into several thousand reports and journal papers (see, e.g. Allen, 1969; Dervin & Nilan, 1986 and Westbrook, 1993). However, as this author has noted in a recent review (Wilson, 1994), information science does not have a monopoly on research in these fields. Several disciplines are concerned, to some extent, with understanding how people seek and make use of information, the channels they employ to gain access to information, and the factors that inhibit or encourage information use. These include: the study of personality in psychology; the study of consumer behaviour; innovation research; health communication studies; organizational decision-making; and information requirements in information systems design.

Each discipline has its own reasons for exploring what will be called “information behaviour”, but it is the claim of this paper that all can be embraced by a general model from which all may learn and which may serve to integrate studies for the benefit of future research in a variety of fields.

It must be stressed that the disciplines mentioned above are not the only fields that could have been included in the review. Mass media research includes much relevant work, as does communication studies in general. However, time did not allow for coverage of these areas and, in any event, it became evident as the review of the literature progressed, that the heart of the subject lies in work in psychology and sociology and a great deal of what is done consists, in essence, of applied psychological and sociological research.

In general, the literature from the field of information science itself was excluded from the review, although occasional exception is made for research that adopts a model from one of the other areas and to draw attention to some similarities between information science approaches and those in other disciplines.

The paper begins by presenting a general model of information-seeking behaviour, which is then used to analyse the literature from fields outside information science in terms of: the

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\*This paper is based on a review of the literature in the fields studied, with a small grant from the British Library Research and Development Department. The depth to which each was covered has depended upon the total time available for the work (four months), by how fruitful an area proved to be, and by the extent to which the same ideas were found in the different disciplines. This is not, therefore, a comprehensive review of the literature of these fields, but an integrated review in terms of a model of information-seeking behaviour evolved by Wilson (1981), which shows how that model may be revised in the light of work in other fields.

concept of information need (illustrated with reference to health information needs); intervening variables in information-seeking behaviour (such as personal characteristics and economic barriers); information-seeking and acquisition behaviours; and information processing and use (with particular reference to learning). It then presents a revised general model on the basis of this analysis.

2. A GENERAL MODEL OF INFORMATION-SEEKING BEHAVIOUR

Any analysis of the literature of information-seeking behaviour must be based upon some general model of what might be called "information behaviour". Wilson's (1981) model (a revised version of which appears as Fig. 1, below) located the concepts of information need, information seeking, information exchange, and information use in a flow diagram that charted the behaviour of an individual faced with the need to find information. Wilson argued that a general model of this kind was useful in identifying areas where additional research could be of value and pointed to the lack of research on information use as an example.

In the same paper Wilson proposed a model of the circumstances that give rise to information-seeking behaviour, the main elements of which are the situation within which a need for information arises (the PERSON performing a ROLE in an ENVIRONMENT), the barriers that may exist to either engaging in information-seeking behaviour or in completing a search for information successfully, and information-seeking behaviour itself. The model was amended in Wilson (1994) to show how Ellis's (Ellis, 1989) work on information-seeking could be incorporated.

3. INFORMATION NEED

At the root of the problem of information-seeking behaviour is the concept of *information need*, which has proved intractable for the reason advanced by Wilson in 1981; that is, *need* is a subjective experience that occurs only in the mind of the person in need and, consequently, is not directly accessible to an observer.<sup>1</sup> The experience of need can only be discovered by deduction from behaviour or through the reports of the person in need. This subjective character

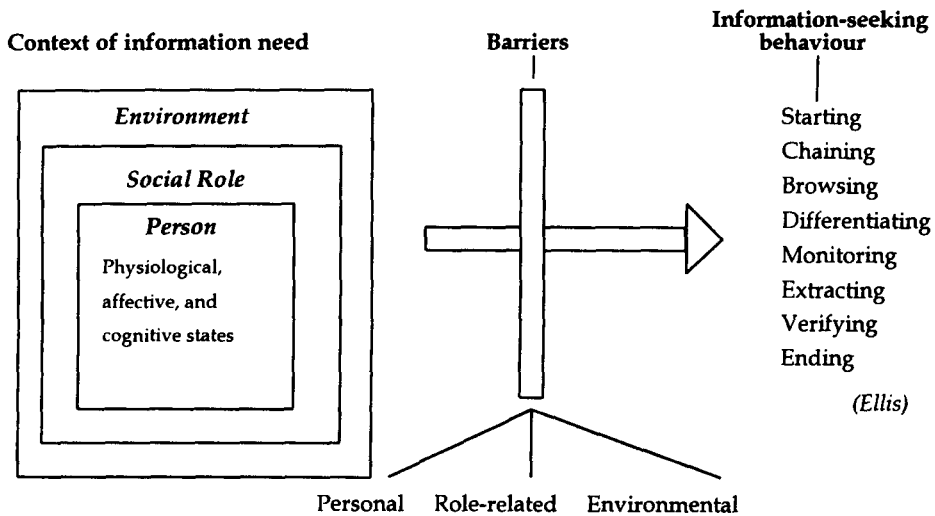


Fig. 1. A general model of information-seeking behaviour (Wilson, 1981, revised).

<sup>1</sup>We exclude, of course, the fact that evidence of extreme physiological need, e.g. hunger, may be observable.

of need is evident, for example, in a definition by Burnkrant (1976) which proposes that need is "a cognitive representation of a future goal that is desired".

However, in spite of the subjective nature of need, various types of need have been defined through deduction and report. For example Morgan and King (1971) propose that needs emerge from three kinds of motives:

- physiological motives (for example, hunger and thirst)
  - unlearned motives (including curiosity and sensory stimulation), and
  - social motives (the desire for affiliation, approval or status, or aggression),
- which accords in part with Wilson's (Wilson, 1981) analysis of needs being cognitive, affective, or physiological.

In fact, the concept of *motive* may be of general use in the study of information-seeking behaviour since, if we assume that, for whatever reason, a person experiences an *information need*, there must be an attendant *motive* actually to engage in such behaviour. Within the general theory of motivation it is suggested that, when a motive is activated, a *belief-value matrix* within the individual is called on. The matrix is believed to contain images of objects that past experience has proved to be relevant for the satisfaction of the aroused need and that different objects will have different values associated with them relating to the believed level of success they will have in satisfying the person's need. (Burnkrant, 1976)

The notion of motive is also implicit in *gratification theory* (Fiske, 1990), which has been developed in mass communications research and which assumes that an audience has complex needs that it seeks to gratify through the use of various media. The same message, transmitted through a medium, may be used by different individuals to gratify different needs. The theory also suggests (Rubin, 1986) that people are active seekers of information to gratify their needs.

McQuail (1972) suggests four main categories of gratification, which fall mainly into what we have called *affective* needs, but for which, clearly, information may have a role in drawing attention to those things that will produce gratification:

- Diversion: escapism, emotional release
- Personal relationships: companionship, social utility
- Personal identity: comparison with life; reality exploration; value reinforcement

That needs may have a cognitive component (as distinct from, for example, physiological needs such as hunger and thirst) is recognized in the concept of the *need for cognition*: the need to find order and meaning in the environment, which is also expressed as the need to know, curiosity, the desire to be informed.

Cacioppo *et al.* (1984) have devised a *need for cognition* scale, which has been tested in the U.S.A. and in Holland (Verplanken *et al.*, 1992). The present author has considerable reservations about the usefulness of the scale, since a high degree of cognitive ability appears to be needed to complete it! However, the idea of a *fundamental* need which drives the search for information is seductive.

### 3.1. Types of information need

In spite of the difficulties with the concept, various categorizations of information need have been produced. For example, Weigts *et al.* (1993) suggest the following categories:

- need for new information;
- need to elucidate the information held; and
- need to confirm information held.

Note, however, that the focus of these types is *cognitive* need and, given the significance of *beliefs* and *values*, we need to add:

- need to elucidate beliefs and values held, and
- need to confirm beliefs and values held.

The mode of questioning in carrying out searches also identifies underlying information needs.

For example, Carter (reported in Chew, 1994) suggests that when an individual is driven to seek information as a result of "needing to know" three modes of questioning behaviour are exhibited:

- questions to discover what is happening ("orientation");
- questions to check that the person is "on the right track" ("reorientation"), and, questions to form an opinion or solve a problem ("construction")

To these we can add, *questions to build one's knowledge of a subject*, which we shall label "extension".

### 3.2. Stress and coping

As an alternative to seeking to define and gain evidence of the elusive *information need*, it may prove more helpful to focus upon the proximate causes of information-seeking behaviour, if these can be discovered. A very general theory from psychology, which has been used in health communication studies and other areas, is that of *stress* and *coping*. Stress is defined as:

...a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and as endangering his or her well-being (Folkman, 1984)

and coping as:

...cognitive and behavioural effects to master, reduce or tolerate the internal and external demands that are created by stressful situations (Folkman & Lazarus, 1985).

To use this model it will be necessary to think of *endangering his or her well-being* in very general terms: in other words, the threat to well-being, and consequent stress, may be minimal in many cases and may not be conceived as such by the person in question.

3.2.1. *Coping and information use.* The *stress/coping* idea offers a useful basis for further research on information-seeking behaviour, particularly as Miller and Mangan (1983) note that:

...one key situational property that has consistently been found to affect stress is whether the individual has maximal information (predictability) or minimum information (unpredictability) about the event and its effects.

Folkman (1984) notes that coping has two major functions: "...the regulation of emotions or distress (emotion-focused coping) and the management of the problem that is causing the distress (problem-focused coping)". Kleiber *et al.* (1995) note that problem-focused coping is involved when there is an effort to change the nature of an encounter in the environment, whereas emotion-focused coping "...involves cognitive activities that do not alter the relationship with the environment but do alter the way in which the person-environment relationship is perceived". Not surprisingly, van Zuuren and Wolfs (1991) find that "monitoring" (that is, information-seeking) correlates highly with problem-focused coping.

The relationship between information-seeking and coping is set out in Krohne's two-dimensional model (Fig. 2 below). This suggests that various states will exist as a result of *intolerance of uncertainty* and *intolerance of arousal*, of which, from an information-seeking behaviour perspective, the upper two cells, representing *Sensitization* and *Anxiety*, are most interesting. If the right hand part of the diagram is seen as "on top of" the left hand part, *Sensitization* is then seen as giving rise to *Constant monitoring* (explained by the high tendency to vigilance and the low tendency to cognitive avoidance), while *Anxiety* will give rise to *Fluctuating coping* (because of the high tendency to cognitive avoidance). The other parts of Fig. 2 may be read in a similar way.

This brief review of stress and coping suggests that it may be a useful part of any revised general theory of information behaviour and could provide a theoretical basis for research in various fields of application. The relationship between *self-efficacy* and coping is discussed further in the following section.

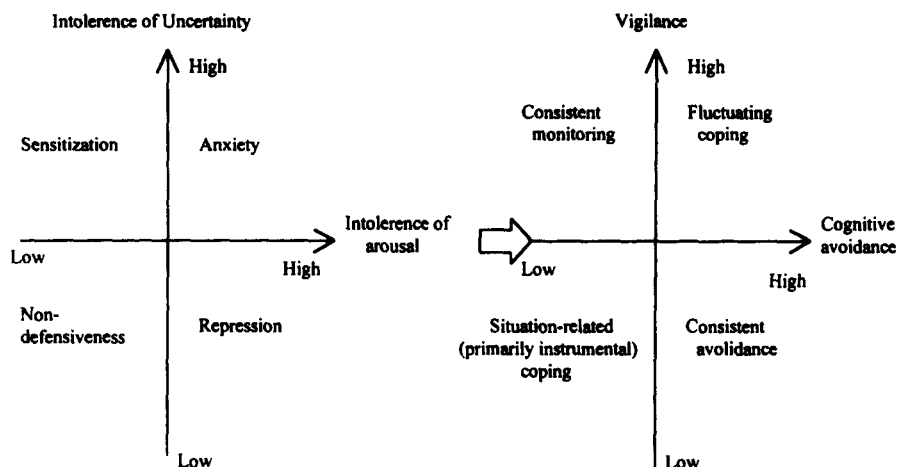


Fig. 2. Two-dimensional model of coping (Krohne, 1986; Krohne, 1989).

#### 4. HEALTH INFORMATION NEEDS

Although the investigation of information needs in relation to health problems and health information services is part of information science in general, the subject has also been investigated by numerous researchers in the health disciplines.

To begin with, we find the same division into cognitive and affective information needs as suggested in Wilson's 1981 model (Wilson, 1981). Thus, Johnson and Meischke (1991a) note that (in terms of seeking information related to cancer), an individual may be looking for factual information about prevention, detection and treatment, or for information that will enable him or her to deal with the problem emotionally.

One can readily understand that affective needs will be very prominent in health-related information-seeking, where the emotional impact of life-threatening diseases or operations is very obvious. In fact, the emotional reaction to medical conditions has led to a significant amount of work on the stress/coping model.

##### 4.1. Stress and coping in health information

The fact that purely cognitive drives cannot explain information-seeking behaviour is attested to by the fact that, even in critical circumstances when the gaps in their knowledge are evident, people do not always seek medical information. van Zuuren and Wolfs (1991) point out that the very information that might enable a person to deal with a problem can be perceived as threatening in itself.

Thus, theories of stress and coping have featured strongly in the health information field, with two cognitive states being proposed as central to understanding an individual's response to an adverse situation. These are: attention, or orientation towards the threat; and cognitive avoidance, or turning attention away from the threat (Krohne, 1993). These dimensions of the situation have been given other names by various researchers but, essentially, they are working with concepts that at least overlap. Thus, Krohne has also used the term *vigilance* instead of attention; and Miller and Mangan (1983) have used the polar opposites *sensitization* and *repression*.

Miller and Mangan (1983) have also used the terms *monitoring* and *blunting* to signify the behavioural counterparts of the cognitive terms. They studied 40 gynaecologic patients who were about to undergo an intrusive diagnostic process (colposcopy). The patients were divided into two groups, *monitors* and *blunters*, according to their scores on the Miller Behavioral Style Scale (MBSS). This Scale divides people into the two categories, "...based on their self-reported preferences for information or distraction in a variety of naturalistic stress situations". The aim

of the work was, as the subtitle of the piece indicates, to answer the question, "Should the Doctor tell all?"

The results were consistent with the theory that *monitors* prefer a high information input before a stressful event and suffer less psycho-physiological arousal when they have information, while *blunters* prefer less information and suffer more arousal when they have a high information input. As the authors note, "When blunters are left to their own devices, they prefer not to scan for threat-relevant information", a view supported by Steptoe and O'Sullivan (1986).

One of the few information scientists to use this model, Baker (1995), studied the information preferences of women with multiple sclerosis, using the MBSS to divide her sample. She notes that, "...regardless of format, monitors were more interested in information about MS than were blunters and further, that their interest occurred earlier in the disease than did the interest of blunters."

Overall, we can say that the stress/coping theory, together with the MBSS behavioural measure, constitutes a useful tool for exploring information-seeking behaviour in relation to health and may have wider application, since stress arises in many situations that are considerably less than life-threatening but may endanger one's "well-being" or, perhaps, self-image, in other ways.

## 5. INTERVENING VARIABLES IN INFORMATION-SEEKING BEHAVIOUR

Whatever the situation in which a person perceives a need for information, engaging in information-seeking behaviour is not a necessary consequence. As the previous section shows, in relation to health information, *blunters* have the ability to set aside their concerns and to cope by, in effect, ignoring stress. This suggests that the individual's personality, perhaps coupled with other factors, may offer its own resistance to information-seeking behaviour. However, there are clearly a number of other potential impediments between the recognition of a need to be informed and the activation of a search for information. In Wilson's (Wilson, 1981) model, three sets of "barriers" to information-seeking behaviour were shown, which were related to the dimensions of the situation in which the person finds himself or herself:

personal barriers;  
social or role-related barriers; and  
environmental barriers.

This formulation has been repeated in one form or another by other writers, some of whom use what we propose as the preferred term, *intervening variables*.

There is, however, a certain difficulty in positioning the barriers between the identification of information-seeking as a suitable coping strategy and the information-seeking behaviour itself. In fact, the barriers, particularly those at the level of the person, may act to prevent the initial emergence of a coping strategy, or may intervene between the acquisition of information and its use. However, with this caveat in mind, it is convenient to deal with the barriers in one place.

### 5.1. *Intervening variables*

As with other aspects of information-seeking behaviour, the intervening variables have been quite exhaustively discussed in the study of personality, health communication literature, consumer research, and innovation studies. The other areas considered in this review (decision-making and information system requirements) contribute rather less. Drawing from several sources, we can identify work on the following sets, categorized under the above headings:

Personal characteristics  
Emotional variables  
Educational variables

Demographic variables  
 Social/interpersonal variables  
 Environmental variables  
 Economic variables  
 Source characteristics

## 6. PERSONAL CHARACTERISTICS

*6.0.1. Cognitive dissonance.* The psychological literature focuses on the concept of *cognitive dissonance* as a motivation for behaviour: that is, conflicting cognitions make people uncomfortable and, consequently, they seek to resolve the conflict in one way or another (Festinger, 1957). One of the ways in which dissonance may be reduced is by seeking information either to support existing knowledge, values or beliefs, or to find sufficient cause to change these factors.

Thus, Aaker *et al.* (1992), reporting work on advertizing and its effects on changes in attitudes towards products, note that, where an advertisement matches the belief held by a person, the person is more likely to advance supporting arguments for choosing the product. However, where there are discrepancies between the communication and the previously held belief, the person is likely to bring forward counter-arguments to the claims being made in the advertisement.

On the other hand, Sorrentino and Short (1990) suggest that:

...many people are simply not interested in finding out information about themselves or the world, do not conduct causal searches...and do not give a hoot for resolving discrepancies or inconsistencies about the self.

This seems to return us to the idea of people having different levels of *cognitive need*, which may be the ultimate driver of information behaviour.

*6.0.2. Selective exposure.* The point made by Sorrentino and Short may be included within the idea of *selective exposure*, which Rogers (1983) has explored. He suggests that,

Individuals generally tend to expose themselves to ideas that are in accordance with their interests, needs or existing attitudes. We consciously or unconsciously avoid messages that are in conflict with our predispositions.

This appears to be a variation of Krohne's (Krohne, 1993) idea of *cognitive avoidance*.

Johnson and Macrae (1994) tested the proposition that people are more likely to bias their information search towards information that matches their stereotypical image of a group rather than towards that which does not match their stereotype. They demonstrated that when a group of students, "...could control the amount and nature of information they received about a group, they displayed the anticipated preference for stereotype-matching information". However, when the students' information acquisition was controlled by the researcher, "...a reduction in their stereotype-based impression of the group" was observed.

Clearly, these ideas present interesting ethical dilemmas for information providers!

*6.0.3. Physiological, cognitive and emotional characteristics.* In a study of the information-seeking behaviour of cancer out-patients (Borgers *et al.*, 1993) it was found that certain characteristics of the patient could act as barriers to seeking information during a consultation with the doctor. These included physiological characteristics such as hearing problems (experienced by 5% of the sample), cognitive characteristics such as the lack of medical knowledge (5%) and verbal limitations (5%), as well as nervousness (20%), an affective characteristic. The study concluded that three factors determined the information-seeking behaviour of patients:

1. The characteristics and perceptions of the patient.
2. Certain characteristics of the patient's companion [i.e. the person accompanying the patient at the interview] and the specialist.
3. Characteristics of the organization and situation.

An Australian study (Kassulke *et al.*, 1993) of health information seeking found that, "...emotional barriers proved to be most significant in limiting access to health services". These "emotional barriers" were said to be, "a construct consisting of questions relating to an inability to make decisions about health and to take advantage of existing health services", and the precise nature of the barriers was not explained. In fact, to speak of "emotional barriers" may be simply another way of talking about "blunting".

6.0.4. *Educational level and knowledge base.* Level of education has been explored as an intervening variable by a number of researchers. For example, in the study by Kassulke discussed above, educational level was associated with risky behaviour in relation to cigarette smoking and excessive alcohol consumption, and with risky behaviour by women in relation to a number of health factors, such as checks for breast cancer and cervical smear tests. In the field of consumer behaviour, Ippolito and Mathios (1990) show that,

...the flow of information about the health benefits of fiber consumption was not uniform across the population in 1985. In particular, information was disproportionately incorporated into the behavior of those with advantages in acquiring and processing information and those with higher valuations of health.

In this study, the concept "advantages in acquiring and processing information" was measured through three variables, *GRADE*, an educational measure; *INCOME*, that is, the total household income; and *MHEAD*, signifying whether there were two adults in the household.

Ippolito *et al.* (1979) had shown that college graduates were more likely to give up smoking following the publication of the U.S. Surgeon General's 1964 Report on Smoking, and Schuker *et al.* (1983) had found a relation between level of education and reactions to the U.S. government's requirement that warnings about saccharin should be placed on soft-drink labels.

Perhaps related to education, Harris (1992) in a study of out-patients at a New Zealand hospital found that medical terminology was a barrier to information exchanges with doctors: 3% of respondents commented specifically on this point.

The effect of the individual's knowledge base has been explored in the field of consumer behaviour. For example, Bettman and Park (1980) suggested that highly knowledgeable people may feel *less* need to search for more information, while MacInnis and Jaworski (1991) proposed that the more knowledgeable the individual, the easier they would find it to encode information, thereby making further information acquisition easier. Finally, Moorman and Matulich (1993) found that high knowledge levels did indeed facilitate information acquisition but also that, when health motivation is high, those with higher health knowledge will perform more actions relating to their health than individuals with lower knowledge levels.

The situation appears to be more complex than even these studies suggest, however, since work by Radecki and Jaccard (1995) suggests that an individual's perception of their own knowledge is influenced by their perception of a friend's knowledge and that personal perceptions of knowledge influence decision-making and behaviour to the extent that people may seek less information on topics they feel knowledgeable about. The role of the friend also points to the fact that information acquisition is not entirely a solitary activity, but has a social dimension.

The study also found that the perceived importance of a topic tends to bias perceptions of knowledge: the more important a topic is to individuals, the more likely they will view themselves as knowledgeable about the subject. In conditions of privacy it was found that persons with less *perceived knowledge* (that is, lower self-perceptions) searched more. In public settings the relationships were more complex but, over all, the study concludes that perceived knowledge is a central construct in the analysis of information-seeking behaviour, perhaps more so than actual knowledge.

6.0.5. *Demographic variables: age, sex and other factors.* Connell and Crawford (1988) found that the amount of health information received by urban residents from all sources declined with age, but that older rural women received a great deal of information from a variety of sources and that the amount declined only slightly with age. Older men received far less information than younger men.

Slevin *et al.* (1988) in a study of a national cancer information service (BACUP) found that use of the service was mainly (80%) by women (although men are marginally more at risk),



either in the 30–49 years age group (52%) or over 60 years of age (17%). More than 85% of enquirers were in non-manual occupations and 97% were white (1.2% came from the Indian subcontinent, compared with 3.6% in the population as a whole). The authors commented that, "...lower social classes make much less use of community health and preventive services", although, again, there is a slightly higher incidence of cancer in the lower socio-economic groups.

Connell and Crawford (1988) found women reported receiving more health information than men from all sources and attributed this to women's traditional role as a care-giver and "lay health care provider".

Feick *et al.* (1986) studied women's searching behaviour for nutrition information on food labels. The study found that participants with children searched for nutrition and ingredient information on particular products, without showing an overall interest in more general nutrition information, suggesting that concern for their children was the motivating factor in information search.

## 7. ECONOMIC BARRIERS

The economic issues related to information-seeking behaviour fall into two categories: direct economic costs, and the value of time. These may apply either to the process of information-seeking itself, or to the consequent actions.

These factors have been extensively explored in the field of consumer behaviour, where a key piece of economic research (Stigler, 1961) has stimulated a great deal of activity. Stigler's work was intended to show, "...that some important aspects of economic organization take on a new meaning when they are considered from the viewpoint of the search for information", and he used the case of the discovery by a searcher of the market price for a product:

Prices change with varying frequency in all markets, and, unless a market is completely centralized, no one will know all the prices which various sellers (or buyers) quote at any given time. A buyer (or seller) who wishes to ascertain the most favorable price must canvass various sellers (or buyers)—a phenomenon I shall term "search."

In Stigler's model, "The cost of search, for a consumer, may be taken as approximately proportional to the number of (identified) sellers approached, for the chief cost is time". Stigler notes that this cost will not be the same for all persons, since the cost of time is higher for persons with larger incomes. He also notes that, "The assimilation of information is not an easy or pleasant task for most people, and they may well be willing to pay more for the information when supplied in an enjoyable form". From the point of view of manufacturers, "...uncertainty concerning his price is clearly disadvantageous" since the cost of search is part of the total cost of purchase, but, "To keep the buyers in a market informed on the current prices of all items of consumption would involve perhaps a thousandfold increase of newspaper advertising".

However, Jacoby *et al.* (1978) report studies that have found evidence of negative or zero relationship between wages and search effort, suggesting that the wage value of time may not be the only factor: for example, people may shop for a variety of reasons other than to discover alternative prices—such as simple enjoyment (see, e.g. Beatty & Smith, 1987).

Stigler predicts that when choice alternatives are similar, search efforts will be **reduced** as the gains to be made are reduced. This is at variance with psychology's uncertainty theory, which suggests that when choice alternatives are similar, search effort will **increase** in an effort to reduce uncertainty (Urbany *et al.*, 1989).

## 8. SOCIAL/INTERPERSONAL BARRIERS

Interpersonal problems are likely to arise whenever the information source is a person, or where interpersonal interaction is needed to gain access to other kinds of information sources.

Borgers *et al.* (1993) found that cancer patients identified several barriers to successful information seeking during consultations: these included the attitude of the specialist, and the presence of other people, such as clinical assistants during the consultation.

In innovation research, the "...established behavior patterns for the members of a social system" (Rogers, 1983) may also act as a barrier to change and, hence, as a barrier to information-seeking leading to change.

Social factors may also act as barriers to access to information and so frustrate an information-seeker. Thus, Howze and Redman (1992), discuss the attempts of the Health Promotion and Education Council of Virginia to reduce premature and preventable death through legislative action on health promotion. They comment:

Among the impediments to the diffusion of social innovations is resistance by vested or privileged groups than benefit from the status quo. Resistance may take many forms including efforts to discredit the innovation. The Council was surprised by two editorials attacking prevention, which appeared in the... Richmond Times-Despatch at times just prior to key committee votes... Although the editorials appeared to be arguing for less government and fiscal restraint, it seemed likely that the hand of the tobacco lobby was at work.

In examining the behaviour of scientists in acquiring information relevant to research and development, Sheen (1992) notes that:

...some technologists effectively manage to draw a boundary round their expertise in order to protect their position and status within a firm: external information sources are utilized but then internalized and used to develop a personal power base.

## 9. ENVIRONMENTAL/SITUATIONAL BARRIERS

Research shows that the immediate situation of information-seeking activity can include elements that represent barriers to continuing that activity, and that the wider environment can also present problems.

*9.0.6. Time.* Cameron *et al.* (1994) found information exchange between patients and doctors was inhibited by the lack of time available, the stress of the situation and the use of unfamiliar terminology. Hannay *et al.* (1992) (cited in Marcus & Tuchfield, 1993) found that a typical consultation with a doctor lasted between 12 and 15 minutes, during which time any examination, diagnosis and explanation of treatment necessary had to be made, which left little or no time for the doctor to act as a source of other forms of health information.

A study of information-seeking by cancer outpatients (Borgers *et al.*, 1993) found that the duration of a consultation and interruptions such as telephone calls were barriers to information-seeking.

*9.0.7. Geography.* Connell and Crawford (1988) also found that the age and geographic location of study participants affected the health information they received. The amount of information received from all sources decreased with age for urban residents, but for the rural residents a high amount of information was received in the 30–44 years age group, levels then dropped in the 45–65 years age range, but rose again for the over 65 years. Older rural women were found to receive a large amount of information from a variety of sources and the levels of information these women received only dropped slightly with age, compared to older men who received far less health information than their younger counterparts.

*9.0.8. National cultures.* Differences in national cultures are particularly significant for the transfer of innovations and the associated information, and may also affect the way members of different cultures view the possibility of information acquisition.

The main work in this area is that of Hofstede (1980) who proposed and tested four dimensions in which cultures might differ. These are: *power distance*, or the acceptance of unequal distribution of power in organizations; *uncertainty avoidance*, or the extent to which a society feels threatened by uncertain situations and so tends to avoid such situations; *individualism-collectivism*, which is rather self-explanatory; and *masculinity-femininity*, or the

prevalence of masculine values of material things, etc., vs that of feminine values such as caring for others. In a later work (Hofstede, 1991) a fifth dimension was added, that is, *long-term/short-term orientation to life*.

On the basis of Hofstede's work and confirmatory work by others, it can be argued that these five dimensions are the crucial dimensions of cultural difference. If so, we might expect to find differences in information-seeking behaviour and information use across cultures correlating with the five dimensions. Thus, we can hypothesize that, in cultures with high power distance measures, information exchange in organizations is likely to be inhibited, whereas it is likely to be facilitated in cultures with high collectivism scores. On the other hand, when one examines Hofstede's analysis of these two factors across fifty countries, it is interesting to see that countries with a strong tradition of library development appear in the small power distance/high individualism quadrant (for example, Norway, Sweden, Denmark, Great Britain, Australia, New Zealand, the U.S.A., Canada, the Netherlands)—perhaps the building of infrastructures to foster individualism is at work here.

Uncertainty avoidance has already appeared in the treatment of the stress/coping theory and has been shown there, in individual behaviour, to be associated with information-seeking. It seems likely that cultures that score high on uncertainty avoidance are likely to foster information-seeking behaviour, and, again, the countries noted above as having a tradition of library development, are high on the uncertainty avoidance scale.

The significance of cultural differences is recognized in Shore and Venkatachalam's (Shore & Venkatachalam, 1994) suggestion that the transfer of information technology is more likely to work effectively where the cultural gap between the countries is least. They note, for example, that, "...when an application is transferred to a different national culture, users may be bound in ways that make it unlikely for them to even think about their 'information needs'". They propose a model for *cultural prototyping* which would ensure that the cultural differences were recognized and dealt with.

## 10. INFORMATION SOURCE CHARACTERISTICS

*10.0.9. Access.* A fundamental requirement for information-seeking is that some source of information should be accessible. The lack of an easily accessible source may inhibit information-seeking altogether, or may impose higher costs than the enquirer is prepared to pay.

In a study of consumer health information needs in a community hospital Phillips and Zorn (1994) found that more than two-thirds of the consumers viewed access to health information as a problem, compared to less than half of the physicians surveyed. Consumers, "...overwhelmingly indicated their personal physician or other health professional [as the first point of call]. The second most frequent source...was the public library..." 92% of consumers indicated that they would use a special consumer health library if the local hospital provided one. The physicians covered by the survey also indicated that they would use and advise their patients to use, a local consumer health library.

*10.0.10. Credibility.* If a seeker of information discovers that an information source is unreliable in the quality and accuracy of the information delivered he or she is likely to regard the source as lacking in credibility. As may be expected, this is a subject of considerable interest in consumer research, since advertisers must persuade consumers to believe their claims for products and services.

In distinguishing between advertisements and publicity—the former paid for, while the latter is not—Kotler (1991) notes that publicity has higher credibility than advertisements, since the connection between the manufacturer and the information is not so directly perceived. Ray (1982) also notes that the introduction of an apparently "objective" context, such as a news report, also lends credibility to publicity.

Lord and Putrevu (1993), in reviewing the literature on advertising vs publicity, note that:

Publicity...delivers information to the consumer as part of "the news"—a forum upon which

consumers are socialized to depend as an accurate, objective and generally sufficient source of information. Whereas the perceived role of an advertiser is to sell his/her product, that of a journalist is to report the facts. Hence, a consumer exposed to marketing information conveyed as part of such news, feature or editorial coverage is unlikely to suspect or search for an ulterior motive on the part of the source or presenter, assuming the message to partake of the same level of credibility associated with other journalistic reports.

*10.0.11. Channel of communication.* Although not strictly a characteristic of the source, the communication channel through which the information is received is sufficiently closely tied to the source to be considered here. In a study of bicycle safety helmet use (Witte *et al.*, 1993) it was found that threatening information (that is, on the dangers of non-use of safety helmets and the need for use) was more effectively presented through interpersonal channels, such as through telephone conversations, rather than through the mass media: "Threatening messages given over mass media channels may simply be ignored by the audience, whereas threatening messages given interpersonally may force audience members to evaluate a given health risk." The *attention/avoidance* idea discussed above may be employed here to explain the result: interpersonal channels are less easy to avoid and force *attention* upon the listener, simply through the need for social courtesy, whereas mass media messages are easy to avoid—they can simply be turned off.

Johnson and Meischke (1991b) found that interpersonal sources of information (consultations with a physician were the preferred source) can be more effective in reducing uncertainty for cancer patients because they provide immediate feedback and social support. Both of these factors give the patient confidence in the advice received. Johnson and Meischke (1991a) also found that interpersonal sources are, "...better suited to handle special individual needs and questions", due to the immediate feedback available from the source.

This phenomenon is well-supported in the information science literature where studies of information-seeking behaviour have frequently shown other people to be the commonest source of information.

## 11. INFORMATION-SEEKING AND ACQUISITION

*11.0.12. Searching and acquisition.* Wilson's formulation of the information-seeking processes implicitly takes active searching as the principle mode as does Ellis's behavioural model of information-seeking. However, other modes of "searching" do take place, although two of these may be better termed "acquisition" (Aaker *et al.*, 1992). From the research reviewed we can identify:

*passive attention:* such as listening to the radio or watching television programmes, where information acquisition may take place without intentional seeking;

*passive search:* signifies those occasions when one type of search (or other behaviour) results in the acquisition of information that happens to be relevant to the individual;

*active search:* where an individual actively seeks out information; and

*ongoing search:* where active searching has already established the basic framework of knowledge, ideas, beliefs or values, but where occasional continuing search is carried out to update or expand one's framework. In consumer research, Bloch *et al.* (1986) define ongoing search as that which is independent of specific purchase needs or decisions and that the motives are to build knowledge for future purchase decisions and simply to engage in a pleasurable activity.

### 11.1. Risk/reward theory

Stigler's prediction that when choice alternatives are similar, search efforts will be reduced as the gains to be made are reduced (p. 559 above) draws attention to the *risk* and *reward* model, which may be considered a general theory of information-seeking behaviour. It is normally

associated with issues of financial cost, but in setting out to search for information in any context we may be risking not only financial resources but also psychological and physical resources.

Settle and Alreck (1989), working in the field of consumer research, suggest that perceived risk has five components:

*performance risk*—concerning the probability of a product performing to an accepted standard;

*financial risk*—is the product affordable, or should a cheaper product be found?

*physical risk*—is the product hazardous to the individual or his property?

*social risk*—will the product impress friends and colleagues? and

*ego risk*—will the product improve the person's state of happiness? (Perhaps "self-esteem" might be substituted for happiness).

Murray (1991) suggests six components, adding *safety risks* and *time/convenience loss risks* to the above, but ignoring physical risk. Murray also suggests that the amount and nature of perceived risk (in terms of uncertainty about a product) will define information needs: more information will be sought by consumers who perceive high risk. The underlying proposition here is that high risk is associated with high reward—if only the reward of diminishing the risk.

Aaker *et al.* (1992) suggest that *active search* occurs when the risk or uncertainty associated with a product is high, as in the case of a major purchase or purchase of an innovative product. They also suggest that active search is likely to occur just before purchasing a product, when the information is unlikely to change and when it is not likely to be forgotten by the consumer.

Information search practices in special libraries would support this proposition, since, for example, exhaustive searches are common in relation to patent information or legal information, where the financial risks of failure to find the information may be high.

## 11.2. Social cognitive theory

The social learning theory is derived from the ideas of stimulus response theory (Rosenstock, 1974); its central construct is self-efficacy (or sense of personal mastery), which Bandura (1977) defines as follows:

An outcome expectancy is defined as a person's estimate that a given behavior will lead to certain outcomes. An efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcomes. Outcome and efficacy expectations are differentiated, because individuals can believe that a particular course of action will produce certain outcome, but if they entertain serious doubts about whether they can perform the necessary activities such information does not influence their behavior.

Bandura makes a clear link between *self-efficacy* and *coping strategies*: "The strength of people's convictions in their own effectiveness is likely to affect whether they will even try to cope with given situations." He goes on to note that feelings of self-efficacy will affect how long someone persists in an action and how much effort he or she puts into the action.

Bandura notes that *efficacy expectations* can be based on four major sources of information: performance accomplishments (that is, carrying out the actions oneself); vicarious experience (or learning from others); verbal persuasion (which may include self-instruction); and physiological states, particularly emotional arousal.

Although Bandura developed the concept of self-efficacy in the field of psychology and intended that it should aid the development of psycho-therapies, there seems to be no reason why the idea should not have more general applicability. Bandura himself suggests that, "The theoretical framework presented in the present article is generalizable beyond the psychotherapy domain...", and we would argue that it can be applied as a general concept determining information-seeking behaviour.

We can hypothesize, for example, that an individual may be aware that use of an information source may produce useful information, but doubt his or her capacity properly to access the source, or properly to carry out a search. In such a case failure to use the source might occur. We can also hypothesize that one of the motives for information-seeking is to gain information to improve one's self-efficacy in coping with problems of whatever kind.

### 11.3. *The acquisition process*

In the field of educational psychology, Armbruster and Armstrong (1993) combined models by Guthrie and Mosenthal (1987) and Dreher (1992) to typify the search process in terms of locating information in text. This combined model incorporated the following four components:

Goal formation:	identifying the goal of the search task;
Text selection:	selection of an appropriate text;
Information extraction and integration:	integrating the extracted information with prior knowledge; and
Evaluation:	recycling with monitoring and evaluation of progress towards the goal

There are similarities here with work in the field of computing, where Norman (1984) suggests that, "The interaction between a person and a computer system involves four different stages of activities—intention, selection, execution and evaluation". Where intention is defined as the "mental characterization of the desired goal", *selection* is the translation of an intention to an action by the selection of one of the available options, *execution* involves entering the command selected into the computer system and *evaluation* is a review of the executed action to direct further activity. The process of selection requires the user to know the options available to him. This information can be acquired in one of four ways: the information may be retrieved from the user's memory, the user's memory may be jogged by the system, a manual or another user, the user may construct or derive an option in a problem-solving fashion, or the user may learn the information through external search of manuals, the system or other people.

These four stages have connections to those proposed for organizational decision-making by Simon (1977), who similarly identified four phases in the search for decision-related information: the *intelligence* phase, where raw data from the environment are obtained and processed to identify problems (which may be seen as preceding Norman's *intention* phase); the *design* phase, in which problems are clarified, potential solutions are assessed for feasibility and a course of action is developed (which overlaps with Norman's *intention* phase); the *choice* phase, when a feasible solution is selected and implemented (which is clearly identical to Norman's *selection*); and the *review*, which equates to *evaluation*.

Putting these two sets of phases together that from Armbruster and Armstrong would give us:

intelligence,  
intention, or goal formation,  
design,  
choice or selection,  
information extraction and integration, and  
review or evaluation.

It is curious, but perhaps not surprising in view of the focus on machine operations that neither Simon nor Norman included any phase equivalent to *information extraction* and *integration*. Ellis's (Ellis, 1989) behavioural analysis of information-seeking fits into this framework as a detailed elaboration of at least part of the information extraction and integration phase.

### 11.4. *Preferred information sources and channels*

Both in consumer research and health communication studies, as well as in media research, attention has been given to the preferred information channels, and the relationship between information and channel.

For example, Johnson and Meischke (1991b) noted that while doctors were the preferred information source for all types of health information there was, "compelling evidence that respondents perceived the utility of various sources very differently for different types of information". Marcus and Tuchfield (1993) also found that to satisfy their "need to know",

patients were seeking information from other sources.

Connell and Crawford (1988) found that the rank order of information sources actually used was:

1. printed media;
2. television;
3. informal networks (friends, doctors);
4. radio;
5. organizations.

Support for these findings was also discovered by Johnson and Meischke (1991a) who reported the following percentages of use of different channels by women seeking cancer information:

media	81%
doctors	38%
friends/family	37%
organizations	37%

The role of media was also reported by Freimuth *et al.* (1989), who noted that much public health information was acquired from the media, in spite of a declared preference for other sources.

However, Johnson and Meischke (1991b) found that, for authoritative information, people's preferences were for: 1. organizations; 2. family; and 3. media

The difference may be explained by Stein's (Stein, 1981) finding that people consult more than one source of information partly as a result of dissatisfaction with the information they receive from one source or another. Thus, if the information dissemination activities of organizations in the health field are inadequate, the main fall-back source may well be the media.

Toggerson (1981) found that, where individuals were exposed to information from more than one channel, their information-seeking behaviour increased.

### 11.5. Active information-seeking for health information

Information-seeking in the health field has proved to be a fruitful area of research, with the bulk of the work having an applied psychology flavour and with considerable attention to the sources of information, both formal and informal, that patients, or health-conscious citizens, use. Because much of the work has been done in the context of private medicine in the U.S.A., the research has often been undertaken with a consumer research orientation.

The reasons for the interest in health information-seeking in the U.S.A. are well expressed by Johnson and Meischke (1991a):

Increasingly, the responsibility for health-related matters is passing to the individual. The social norms which cast doctors and public health officials as the brokers of medical information are yielding to an era in which individuals actively seek information. Individuals have to choose between a variety of information sources, including the relatively new sources represented by organizations, and then use the information they acquire to select options for health, for prevention, and for treatment.

Elsewhere (Johnson & Meischke, 1993) the authors note that, "Individual information seeking has become a critical element in determining health behaviours" and propose a comprehensive model of information-seeking synthesizing the health belief model (Rosenstock, 1974), uses and gratifications theory (Rubin, 1986), and a model of media exposure and appraisal (Johnson, 1983). This model, "...suggests that health-related factors provide the motive force for information-seeking actions, which are shaped by information carrier factors": and is expressed diagrammatically in Fig. 3.

This model was applied to the discovery by women of mammography information in magazines and the results showed very good fit to the model. However, the health-related factors proved to be not as strong as the information-carrier factors, leading the authors to suggest that future work on health information-seeking from mass media should focus on the communicative aspects, rather than the health-related aspects.

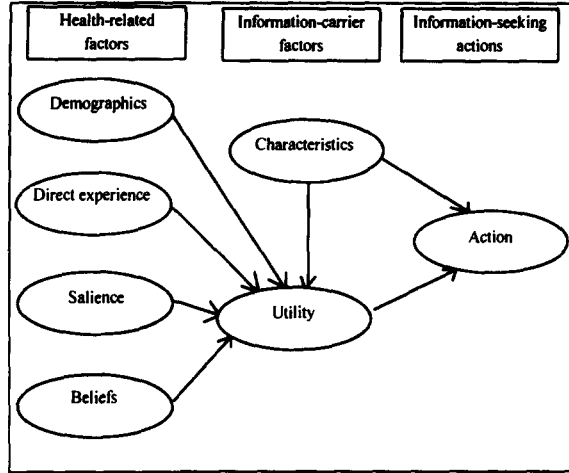


Fig. 3. Comprehensive model of information-seeking (Johnson and Meischke, 1993).

11.6. A general model of consumer information acquisition.

Bettman (1978) has outlined a general framework for studying consumer information acquisition and search strategies, which fits very well into the framework being evolved here. It is presented in Fig. 4, below. It will be seen that for both internal search (i.e. memory) and external search, Bettman proposes three factors: direction—which pieces of information are examined; degree—how much information is sought; and patterns—the organization of the information in memory in internal search, and in external search, the organization of search procedures. The latter point, in consumer research, relates to such issues as whether the consumer searches for brands of products or attributes of products.

“Being confronted” is what has been called elsewhere, passive attention, and Bettman proposes is of two kinds, “true” passive attention, which he terms low involvement learning, and “attention due to interrupts”, i.e. having one’s attention attracted when some existing behaviour is interrupted (see Fig. 4).

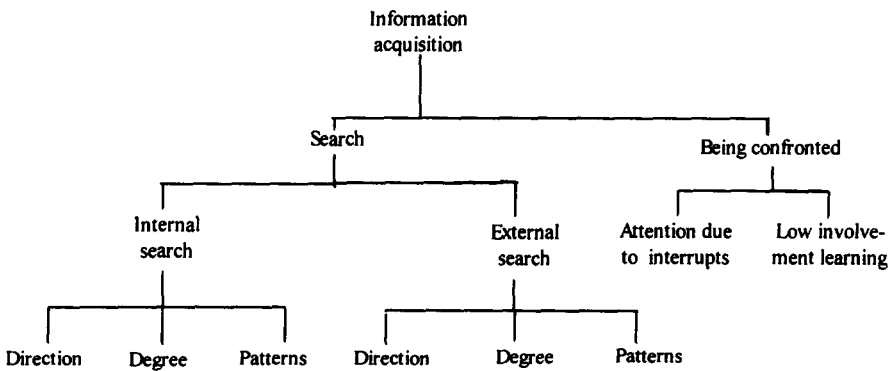


Fig. 4. Consumer information acquisition (simplified from Bettman, 1978).

12. INFORMATION PROCESSING AND USE

The fact that a situation demands information to fill cognitive gaps, to support values and beliefs, or to influence affective states, and that sources of information are available and



accessible to the searcher is no guarantee that the information will be “processed” (i.e. incorporated into the users’ framework of knowledge, beliefs or values) or used (i.e. lead to changes in the user’s state of knowledge, behaviour, values or beliefs).

One of the problems with this aspect of information behaviour is that information processing is as subjective as information need and, like information need, is not directly observable, since it takes place in the mind of the individual. Another difficulty is that the association between information processing and learning is so close as to be almost identical and learning theory has been covered only incidentally in this review.

Most of the literature we have reviewed appears to take information use as non-problematical: the concern is mainly with the factors that create the need for information and the factors that affect the choice of information sources and channels. Thus, Wilson’s (Wilson, 1981) conclusion that information use was an under-researched area appears to be borne out in areas of research other than information science.

The exceptions to this general conclusion are found in the fields of innovation research and research into decision-making in organizations. Consequently, this section will focus on contributions from these areas, together with such work from psychology and consumer research as appears to be relevant.

### 12.1. *The implementation of innovations*

The seminal researcher in the field of the diffusion of social innovations is Rogers (1983), whose work has been taken into over into a number of fields, including that of social cognitive theory (Bandura, 1986). Howze and Redman (1992), drawing upon Bandura (1986); Rogers & Shoemaker (1971) and Rogers (1983) note that the factors that can affect the acceptance or rejection of a social innovation include:

...(1) the characteristics of the innovation that make it more or less attractive; (2) the role of opinion leaders and change agents; (3) the characteristics of adopters and their culture and the configuration of the culture’s communications; (4) the extent to which the innovation must complete with other innovations for adopter attention and resources; and (5) the vigorousness with which the innovation is marketed.

We might hypothesize that these same factors are likely to affect the acceptance of innovative information, such as research findings, and research utilization has also been studied within Rogers’s diffusion of innovation model. For example, Barta (1995) examined the perceived barriers to research utilization by nursing educators and related the extent of innovation to information sources. From an information provider’s point-of-view her results are interesting in that the top three sources of information were, (1) nursing journals, (2) nursing texts, and (3) the *Cumulated Index of Nursing Literature*. Barta also found that, “Respondents who selected nursing journals were more likely to have a higher mean Total Innovation Adoption Score than those who did not...”.

Bandura’s (1986) Social Cognitive Theory, also proposes that successful diffusion efforts have four distinct phases:

1. Selection of an optimal setting for introducing innovation.
2. Creation of the necessary preconditions for change.
3. Implementation of a demonstrably effective program.
4. Dispersion of the innovation to other areas through the aid of successful examples.

Given the extent to which the diffusion of innovations depends upon the transfer of knowledge and information, these factors suggest that knowledge and information on their own will not accomplish the goals of a diffusion process if other factors are not present and if the phases of a programme have not been effectively designed. In a very real sense, therefore, the use of information is as dependent upon the context of use as information need is dependent upon the situation under which it arises.

### 12.2. Presentation format

Presentation format has been extensively in consumer behaviour as a key factor in information processing (for example, Bettman & Kakkar, 1977). Some of the work is laboratory-based, involving display boards (Jacoby *et al.*, 1976) and eye-movement tracking, and seemingly rather artificial for that reason, but the results are interesting from a general perspective. Bettman and Kakkar report on two investigations and conclude that:

...the strategies used to acquire information are *strongly* affected by the structure of the information presented. In effect, consumers process information in these studies in the form it is given. Acquisition strategies are totally adapted to the task environment.

In discussion of the results the authors point to the general principle that merely presenting information is not enough: "Even if information is available, if it is not easily processable it cannot be used by consumers". That is:

...if certain methods of processing information are easier to carry out or more effective for consumers than others, *information must be presented in a format congruent with those methods of processing.*

These ideas are fully in accord with the ideas advanced by Tufte (1983) Tufte (1990) in his work on the visual presentation of data, and by Dolby and Clark (1982) on "the language of data".

## 13. INFORMATION PROCESSING AND LEARNING

### 13.1. Selectivity and information relevance

A discussion of the concept of *selective exposure* was presented earlier (see p. 557), where it was seen as relating to a tendency to select those information sources and that information that was likely to confirm prior held beliefs, attitudes and knowledge.

However, at the level of examining information to determine its value, the same selective processes are likely to be in play. This, indeed, is confirmed to a degree by Yzerbyt and Leyens (1991) who carried out experiments to test the theoretical proposition that people would request less information when presented with negative information on the personalities of individuals than they would if the earlier information was positive. In other words, more information was requested when the incoming information confirmed initial perceptions of the person than when those perceptions were disconfirmed.

## 14. A REVISED GENERAL MODEL OF INFORMATION BEHAVIOUR

This review shows that Wilson's (Wilson, 1981) model needs to be expanded to provide a more effective framework for the consideration of information behaviour in general. In particular, there is a need to include a stage between the *person-in-context* and the decision to seek information. This is the point that Dervin (1983) labels the *gap* between *situation* and *use*. We propose to "fill the gap" by inserting the concept of *activating* mechanism, using the *stress/coping* model as an example of a theoretical approach to such a mechanism, allowing, however, for sources of motivation other than stress to exist.

A further need is to elaborate the concept of *intervening variables* or *barriers*, to specify the fact that *characteristics of the information source* may constitute a barrier, either to information-seeking behaviour or to information processing, and that *personal variables* may be either *psychological or demographic*.

Research also suggests the need for a further intermediate stage (or activating mechanism) between the determination of need and the initiation of action to satisfy the need. Here we propose the *risk/reward* theory, *social learning* theory and the concept of *self-efficacy*, as intervening concepts. Given the relationship of self-efficacy to coping, it is debatable whether

the concept should appear here or as part of the *stress/coping* element but, given its relationship to social learning theory, the location shown seems at least equally appropriate.

Wilson's framework (and Ellis's elaboration of the stages of information-seeking behaviour) also deal only with the *active search* for information and the framework needs to be expanded to include other modes of information seeking, which may have different characteristics. This report draws attention to other analyses of the search process and shows that room exists for further research on the processes that may be peculiar to the other search modes.

Finally, the model needs extension to include *information processing* and *information use*, which are the stages beyond information-seeking and which provide the link back to the need-arousing situation of the person-in-context.

Figure 5 is, thus, an expanded version of Wilson's (Wilson, 1981) model, which takes the findings of this review into account. Expanded in this way, the model can be taken to apply to *information behaviour* more generally, rather than solely to information-seeking behaviour. The diagram has been simplified by showing the *intervening variables* at only one point, whereas at least some of the variables may intervene between *context* and *activating mechanism*, between *activating mechanism* and *information-seeking behaviour* and between *information-seeking behaviour* and *information processing and use*.

## 15. CONCLUSION

Although a great deal of research has been reviewed to bring the model to its present state, time has not allowed for the effective incorporation of the findings of all the research reviewed. For example, some work puts a great deal of emphasis on other aspects of the person, or the situation, or, in the case of mass media in particular, on characteristics of the information sources not discussed above. Also, although the situation in which the initial need for information arises has occasioned the investigation of a number of variables in various studies, the situation within which the information is found and processed appears to have been given less analysis and may be of some significance, particularly in respect of the role of computers in information-seeking.

However, we believe that, in spite of the omissions, the ideas presented throughout this

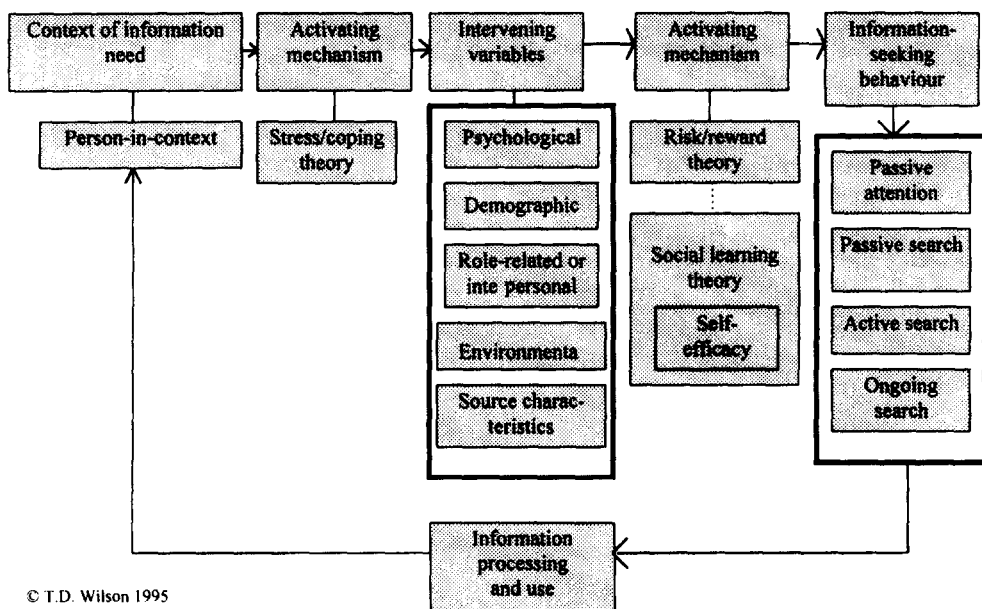


Fig. 5. A revised general model of information behaviour.

review demonstrates to the information science researcher that exploration of other disciplines can be productive of research ideas. With certain exceptions, much of the work reported here has been ignored by information scientists and we believe that there are analytical concepts, models and theories that need to be absorbed into information science as a matter of urgency. We also believe that the model offered in Fig. 5 could be used to analyse the existing information science literature and identify areas of future research interest.

Most obviously, the stress/coping theory needs to be applied to fields outside of health information to determine whether a generalized concept of stress has validity and to determine whether coping strategies other than monitoring and blunting are developed in other situations of stress. Again, there is scope for research on the risk/reward model to discover what kinds of risks are perceived by information users and how they are balanced against anticipated rewards from discovering useful information; the same is true for the idea of self-efficacy and, for example, whether perceptions of efficacy in one situation (for example, using an OPAC) are directly transferable to other information-searching situations (such as using an Internet search engine). Finally (but not exhaustively), there is scope for a great deal of work on how the wide range of possible intervening variables actually affects specific search situations or particular groups of users.

Exploration of these areas, and others, will ensure that research into information behaviour has a long and healthy life.

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## REFERENCES

- Aaker, D. A., Batra, R., & Myers, J. G. (1992). *Advertising management*, 4th ed. Englewood Cliffs, NJ: Prentice Hall.
- Allen, T. J. (1969). Information needs and uses. *Annual Review of Information Science and Technology*, 4, 3–29.
- Armbruster, B. B., & Armstrong, J. O. (1993). Locating information in text: a focus on children in the elementary grades. *Contemporary Educational Psychology*, 18, 139–161.
- Baker, L. M. (1995). A new method for studying patient information needs and information seeking patterns. In: International Symposium on Health Information Research, Sheffield, 5–7 April 1995 (pp. 67–75). Sheffield: University of Sheffield, Department of Information Studies, Centre for Health Information Management Research.
- Bandura, A. (1977). Self efficacy: towards a unifying theory of behavioural change. *Psychological Review*, 84, 191–215.
- Bandura, A. (1986). *Social foundations of thought and action: a social-comparison theory*. Englewood Cliffs, NJ: Prentice Hall.
- Barta, K. M. (1995). Information-seeking, Research utilization and barriers to research utilization of pediatric nurse educators. *Journal of Professional Nursing*, 11, 49–57.
- Beatty, S. E., & Smith, S. M. (1987). External search efforts: an investigation across several product categories. *Journal of Consumer Research*, 14, 83–95.
- Bettman, J. A. (1978). Consumer information acquisition and search strategies. In A. A. Mitchell (Ed.), *The effects of information on consumer and market behaviour*. Chicago, American Marketing Association.
- Bettman, J. R., & Kakkar, P. (1977). Effects of information presentation format on consumer information acquisition strategies. *Journal of Consumer Research*, 3, 233–240.
- Bettman, J. R., & Park, C. W. (1980). Effects of prior knowledge and experience and phase of the choice process on consumer decision processes. *Journal of Consumer Research*, 7, 234–248.
- Bloch, P. H., Sherrell, D. L., & Ridgeway, N. M. (1986). Consumer search: an extended framework. *Journal of Consumer Research*, 13, 119–126.
- Borgers, R., Mullen, P. D., Meertens, R., Rijken, M., Eussen, G., Plagge, I., Visser, A. P., & Blijham, G. H. (1993). The information seeking behaviour of cancer outpatients: a description of the situation. *Patient Education and Counselling*, 22, 35–46.
- Burnkrant, R. E. (1976). A motivational model of information-processing intensity. *Journal of Consumer Research*, 3, 21–30.
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 42, 306–307.
- Cameron, P., Corbett, K., Duncan, C., Hegyi, K., Maxwell, H., & Burton, P. F. (1994). Information needs of hospital patients: a survey of satisfaction levels in a large city hospital. *Journal of Documentation*, 50, 10–23.
- Chew, F. (1994). The relationship of information needs to issue relevance and media use. *Journalism Quarterly*, 71, 676–688.

- Connell, C. M., & Crawford, C. O. (1988). How people obtain their health information: a survey in two Pennsylvania counties. *Public Health Reports*, *103*, 189–195.
- Dervin, B. (1983). An overview of sense-making research: concepts, methods and results to date. Paper presented at the International Communications Association Annual Meeting, Dallas, May, 1983.
- Dervin, B., & Nilan, M. (1986). Information needs and uses. *Annual Review of Information Science and Technology*, *25*, 3–33.
- Dolby, J. L., & Clark, N. (1982). *The language of data*. Los Altos, CA: Dolby Associates.
- Dreher, M. J. (1992). Searching for information in textbooks. *Journal of Reading*, *35*, 364–371.
- Ellis, D. (1989). A behavioural approach to information retrieval system design. *Journal of Documentation*, *45*, 171–212.
- Feick, L. F., Herrmann, R. O., & Warland, R. H. (1986). Search for nutrition information: a probit analysis of the use of different information sources. *Journal of Consumer Affairs*, *20*, 173–192.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, California, Stanford University Press.
- Fiske, J. (1990). *Introduction to communication studies*, 2nd ed. London: Routledge.
- Folkman, S. (1984). Personal control and stress and coping processes: a theoretical analysis. *Journal of Personality and Social Psychology*, *46*, 839–852.
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, *48*, 150–170.
- Freimuth, B. J., Stein, J. A., & Kean, T. J. (1989). *Searching for health information: the Cancer Information Service Model*. Philadelphia: University of Pennsylvania Press.
- Guthrie, J. T., & Mosenthal, P. (1987). Literacy as multidimensional: locating information and reading comprehension. *Educational Psychologist*, *22*, 279–297.
- Hannay, D., Usherwood, T., & Platts, M. (1992). Workload of General Practitioners before and after the new contract. *British Medical Journal*, *304*, 615–618.
- Harris, J. (1992). You can't ask if you don't know what to ask: a survey of the information needs and resources of hospital outpatients. *New Zealand Medical Journal*, *105*, 199–202.
- Hofstede, G. (1980). *Culture's consequences: international differences in work-related values*. Beverly Hills, CA: Sage.
- Hofstede, G. (1991). Cultures and organizations: software of the mind. Intercultural cooperation and its importance for survival. London: McGraw-Hill International (UK), Ltd.
- Howze, E. H., & Redman, L. J. (1992). The uses of theory in health advocacy—politics and programs. *Health Education Quarterly*, *19*, 369–383.
- Ippolito, P., Murphy, R. D., & Sant, D. (1979). Consumer responses to cigarette health information. Washington, DC: Federal Trade Commission (Staff Report).
- Ippolito, P., & Mathios, A. D. (1990). Information, advertising and health choices: a study of the cereal market. *RAND Journal of Economics*, *21*, 459–480.
- Jacoby, J., Chestnut, R. W., & Fisher, W. A. (1978). A behavioral process approach to information acquisition in non-durable purchasing. *Journal of Marketing Research*, *15*, 532–544.
- Jacoby, J., Chestnut, R. W., Weigl, K. C., & Fisher, W. A. (1976). Pre-purchase information acquisition: description of a process methodology, research paradigm, and pilot investigation. In B. B. Anderson (Ed.), *Advances in consumer research*, Vol. 3, (pp. 306–314). Chicago, Association for Consumer Research.
- Johnson, L. C., & Macrae, C. N. (1994). Changing social stereotypes: the case of the information seeker. *European Journal of Social Psychology*, *24*, 581–592.
- Johnson, J. D. (1983). A test of a model of magazine exposure and appraisal in India. *Communication Monographs*, *50*, 148–157.
- Johnson, J. D., & Meischke, H. (1991). Women's preferences for cancer information from specific communication channels. *American Behavioral Scientist*, *34*, 742–755.
- Johnson, J. D., & Meischke, H. (1991). Cancer information: women's source and content preferences. *Journal of Health Care Marketing*, *11*, 37–44.
- Johnson, J. D., & Meischke, H. (1993). A comprehensive model of cancer-related information seeking applied to magazines. *Human Communications Research*, *19*, 343–367.
- Kassulke, D., Stenner, D. K., Coory, M., & Ring, I. (1993). Information seeking behaviour and sources of health information: associations with risk factors status in an analysis of three Queensland electorates. *Australian Journal of Public Health*, *17*, 51–57.
- Kleiber, C., Montgomery, L. A., & Craft-Rosenberg, M. (1995). Information needs of the siblings of critically ill children. *Children's Health Care*, *24*, 47–60.
- Kotler, P. (1991). *Marketing management: analysis, planning, implementation and control*, 7th ed. Englewood Cliffs, NJ: Prentice Hall.
- Krohne, H. W. (1986). Coping with stress: dispositions, strategies, and the problem of measurement. In C. D. Spielberger and I. G. Sarason (Eds), *Dynamics of stress*. New York: Plenum.
- Krohne, H. W. (1989). The concept of coping modes: relating cognitive person variables to actual coping behaviour. *Advances in Behavioural Research and Theory*, *11*, 235–249.
- Krohne, H. W. (1993). Vigilance and cognitive avoidance as concepts in coping research. In H. W. Krohne (Ed.), *Attention and avoidance: strategies in coping with aversiveness* (Chapter 2). H.W. Seattle: Hogrefe and Huber.
- Lord, K. R., & Putrevu, S. (1993). Advertising and publicity: an information processing perspective. *Journal of Economic Psychology*, *14*, 57–84.
- MacInnis, D. J., & Jaworski, B. J. (1991). Enhancing and measuring consumers' motivation, opportunity, and ability to process brand information from ads. *Journal of Marketing*, *53*, 1–23.
- McQuail, D. (1972). *Sociology of Mass Communications*. Harmondsworth: Penguin.
- Marcus, S. H., & Tuchfield, B. S. (1993). Sharing information, sharing responsibility: helping health care consumers make informed decisions. Proceedings of the Annual-Symposium on Computing Applied to Medical Care (pp. 3–7).
- Miller, S. M., & Mangan, C. E. (1983). Interesting effects of information and coping style in adapting to gynaecological stress: should a doctor tell all? *Journal of Personality and Social Psychology*, *45*, 223–236.

- Moorman, C., & Matulich, E. (1993). A model of consumers' preventive health behaviours: the role of health motivation and health ability. *Journal of Consumer Research*, 20, 208–228.
- Morgan, C. T., & King, R. A. (1971). *Introduction to psychology*, 4th ed. New York: McGraw-Hill.
- Murray, K. B. (1991). A test of services marketing theory: consumer information acquisition activities. *Journal of Marketing*, 55, 10–25.
- Norman, D. A. (1984). Stages and levels in human-machine interaction. *International Journal of Man-machine Studies*, 21, 365–375.
- Phillips, S. A., & Zorn, M. J. (1994). Assessing consumer health information needs in a community hospital. *Bulletin of the Medical Library Association*, 82, 288–293.
- Radecki, C. M., & Jaccard, J. (1995). Perceptions of knowledge, actual knowledge, and information search behaviour. *Journal of Experimental Social Psychology*, 31, 107–138.
- Ray, M. L. (1982). *Advertising and communication management*. Englewood Cliffs, NJ: Prentice Hall.
- Rogers, E. M. (1983). *Diffusion of Innovation*, 3rd ed. New York: The Free Press.
- Rogers, E. M., & Shoemaker, F. F. (1971). *Communication of innovations*, 2nd ed. New York: The Free Press.
- Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. *Health Education Monographs*, 2, 328–335.
- Rubin, A. M. (1986). Uses, gratifications and media effects research. In J. Bryant and D. Zillmann (Eds.), *Perspectives in media effects*, (pp. 281–301). Hillsdale NJ, Lawrence Erlbaum.
- Schuker, R. E., Stokes, R. C., Stewart, M., & Henderson, D. P. (1983). The impact of the saccharin warning label on sales of diet soft drinks in supermarkets. *Journal of Public Policy and Marketing*, 2, 46–56.
- Settle, R. B., & Alreck, P. (1989). Reducing buyers' sense of risk. *Marketing Communications*, January, 34–40.
- Sheen (1992) Barriers to scientific and technical knowledge acquisition in industrial R. & D. *R. & D. Management*, 22, 136–143.
- Shore, B., & Venkatachalam, V. (1994). Prototyping: a metaphor for cross-cultural transfer and implementation of IS applications. *Information and Management*, 27, 175–184.
- Simon, H. (1977). *The new science of management decisions*. Englewood Cliffs, NJ: Prentice Hall.
- Slevin, M. L., Terry, Y., Hallett, N., Jefferies, S., Launder, S., Plant, R., Wax, H., & McElwain, T. (1988). BACUP—the first two years: evaluation of a national cancer information service. *British Medical Journal*, 297, 669–672.
- Sorrentino, R., & Short, J. (1990). Uncertainty orientation, motivation, and cognition. In R. Sorrentino and E. Higgins (Eds.), *Handbook of Motivation and Cognition*. New York: The Guilford Press.
- Stein, J. A. (1981). Irradiation-related thyroid cancer: influencing the health behaviour of high risk individuals through mass media and a telephone information service. Paper presented to the American Association for Cancer Education, San Diego.
- Stephoe, A., & O'Sullivan, J. (1986). Monitoring and blunting coping styles in women prior to surgery. *British Journal of Clinical Psychology*, 25, 143–144.
- Stigler, G. (1961). The economics of information. *Journal of Political Economy*, 69, 213–225.
- Toggerson, S. K. (1981). Media coverage and information seeking behaviour. *Journalism Quarterly*, 58, 89–93.
- Tufte, E. R. (1983). *The visual display of quantitative information*. Cheshire, CT: Graphics Press.
- Tufte, E. R. (1990). *Envisioning information*. Cheshire, CT: Graphics Press.
- Urbany, J. E., Dickson, P. R., & Wilke, W. L. (1989). Buyer uncertainty and information search. *Journal of Consumer Research*, 16, 208–215.
- van Zuuren, F. J., & Wolfs, H. M. (1991). Styles of information seeking under threat: personal and situational aspects of monitoring and blunting. *Personality and Individual Differences*, 12, 141–149.
- Verplanken, B., Hazenberg, P. T., & Palenewen, G. T. (1992). Need for cognition and external information search effort. *Journal of Research in Personality*, 26, 128–136.
- Weigts, W., Widdershoven, G., Kok, G., & Tomlow, P. (1993). Patients' information seeking actions and physicians' responses in gynaecological consultations. *Qualitative Health Research*, 3, 398–429.
- Westbrook, L. (1993). User needs: a synthesis and analysis of current theories for the practitioner. *RQ*, 32, 541–549.
- Wilson, T. D. (1981). On user studies and information needs. *Journal of Documentation*, 37, 3–15.
- Wilson, T. D. (1994). Information needs and uses: fifty years of progress? In B. C. Vickery (Ed.), *Fifty years of information progress: a Journal of Documentation review* (pp. 15–51). London, Aslib.
- Witte, K., Stokols, D., Iturate, P., & Scheander, M. (1993). Testing the health belief model in a field study to promote bicycle safety helmets. *Communication Research*, 20, 564–586.
- Yzerbyt, V. Y., & Leyens, J. P. (1991). Requesting information to form an impression: the influence of valence and confirmatory status. *Journal of Experimental Social Psychology*, 27, 337–356.