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**Approaches to Investigating Information Interaction and Behaviour**

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The field of Information Interaction and Behaviour took its place on the research scene in the early 1960s. Although it has expanded greatly with the introduction of computer-based information systems—and particularly with the arrival of the web—a few studies had been conducted even before the field was recognized as a research area, dating from the 1930s on (e.g., Akers, 1931). The definition of the field is still evolving and its title has gradually changed. Nevertheless, its goal has always been to investigate the behaviour of people when they interact with information (See Chapter 3 ‘Information Behaviour and Seeking’ for a description of the main components of research in human information seeking behaviour).

This chapter analyses the approaches that HIB (Human Information Behaviour) researchers have applied when they investigated information seeking behaviour—that is, how people look for information when they use electronic information systems. The development of these approaches followed those in other social sciences, if with some delay. While HIB studies in the first two decades were guided by one and the same approach (materialized through predominantly large scale questionnaires), later years saw a rapid growth in variety. The diverse approaches are not isolated from one another, however. They are connected through several dimensions that point to their commonalities and differences.

The sections below explain some of these dimensions and then discuss the contributions of HIB studies to research as well as design. The dimensions are: philosophical stance, research setting, level of control, instruments for data collection, level of generalization, nature of data and analysis and method of reasoning.

**Philosophical stance**

All researchers have a philosophical stance that guides their work, whether or not they recognize it. Not having a stance is itself a stance, as is switching stances from one project to another. A researcher stance shapes the decisions about what research questions to investigate and these questions guide the study design, including the approach to be applied. HIB research has been directed by several stances and discussing all of them requires a book of its own. Here I adapt a simplistic dichotomy—that between the *positivist* and the *non-positivist* stances. The positivist stance was the first to influence HIB and IR (Information Retrieval) research. IR evaluation investigations have been guided only by positivism—which has often been named ‘the scientific method’—and is still the dominant stance in HIB research.

Positivism can be characterized by various doctrines, such as: knowledge claims can be established only by empirical research; only the observable is researchable; and scientific research is objective, free of value judgment, and is based on testable factual statements. Non-positivist approaches are those that reject at least one of these doctrines. The interpretivists approach is most common among non-positivist researchers in HIB. Examples of such approach are *sense making* (Dervin, 1992) and *constructivism* (Talja, Tuominen, & Savolainen, 2005). The HIB literature provides several discussions about the application of non-positivist stances (e.g., Budd, 2005; Hjørland, 2004; Radford & Radford, 2005; Sundin & Johannissoon, 2005; Wikgren, 2005; and Wilson, 2003).

**Research setting**

An HIB research project can take place in the laboratory or in the field, that is, the place where the study participants function regularly. The main advantage of conducting a study in the lab is the control researchers have over the conditions under which the study takes place. When studying participants in their work place, for instance, the participants might be interrupted by phone calls or by a colleague’s visit or they may be preoccupied with action-related issues that are not relevant to the research project. Such interruptions point to the advantage of a field study: it is conducted under conditions that are as close to reality as possible, while lab studies create an artificial setting. In addition, labs are essential for studies that utilize special technology to collect data, such as video cameras and other recording software and equipment. Clearly, there is a trade-off between these options and researchers select the setting according to the specifics of the research project, its goals and priorities.

**Level of control**

Humans are complex and so is their information seeking behaviour. Many elements shape seeking behaviour and some interact with one another, which makes it unattainable to investigate all of them in one study. A common way to overcome this hurdle is to control some elements and ignore the influence of the others. Consider an hypothetical study to investigate the effect of subject specialty—such as astronomy, medicine or oceanography—on seeking behaviour. In designing the study, a researcher wants to consider other elements that seem to affect searching behaviour, such as level of experience in information seeking, the type of the organization in which the specialists work or the type of the tasks they carry out regularly. The researcher, however, is not interested in these elements but only in the subject specialty. He may control some or all of these elements or completely ignore them. Controlling the searching experience, for instance, he may construct a sample that includes a range of experience levels, or he may decide to focus only on experienced searchers. Controlling, or ignoring the other elements makes it possible for a researcher to focus on the elements of interest—*subject specialty* in this example.

*Experiments*

When researchers want to focus on a few specific elements—such as, cognitive style, experience in using a particular information system or personality traits—they select to conduct an *experiment* in which they keep under control, as much as possible, other elements that may affect behaviour, or they ignore them altogether. In the broadest sense, an experiment is a study that introduces artificial components to its conditions.

Experiments are conducted either in the lab or in the field and they most often test the effect of a few elements (the independent variables) on other elements (the dependent variables). Researchers control the variability of the independent variables and measure the variability in the dependent variables without controlling them. Most IR research aims at evaluating the performance of system components and at comparing the performance of individual systems (see Chapter 14 ‘Evaluation’ for a detailed description of IR experiments). Experiments in HIB are most often carried out to discover the effect of cognitive elements—such as learning style, cognitive style and mental models—on pre-determined elements in seeking behaviour.

Lab experiments

In the extreme case of lab experiments, participants in the same setting are all asked to carry out the same simulated task—the task that is the focus of the study—such as searching specific set of requests, evaluating the relevance of a set of documents or assigning metadata to a set of documents. The findings can then be analysed in various ways, quantitatively or qualitatively, depending on the purpose of the study.

An example of a typical experiment may illustrate the procedure. Palmquist & Kim (2000) investigated the effect of cognitive style and web experience on searching performance. Specifically, they compared two cognitive styles—field dependent and field independent—and two levels of experience: novice and experienced. They selected 48 undergraduate students from a group of 100 volunteers to create a study sample in which half of the 24 students with the same cognitive style were novices and half experienced. Each participant came to the same lab and was asked to search the same two questions on the web, beginning from the same web page. That is, level of education, cognitive style, level of experience, location, task and search starting point were all controlled. In this experiment, the elements of interest received controlled variability (field dependent vs. field independent and novice vs. experienced) and the others were kept constant. Search performance was not controlled and was measured according to (1) the time to retrieve relevant information, and (2) the number of nodes traversed for retrieving a relevant information item[[1]](#footnote-1).

Field experiments[[2]](#footnote-2)

Experiments can be conducted in the natural setting of the participants when controlling some elements. Although not common in HIB research, some large scale studies have adapted this approach. Spink et al. (2002) investigated seeking behaviour for the purpose of testing the fitness of a few seeking behaviour models and the creation of a new, integrated model, among other goals. Almost 200 participants were invited to the library in their universities to carry out their own searches with various levels of interaction with an intermediary. In addition, participants completed a pre-search and a post-search questionnaires. As a field experiment, the controls introduced in this study required the participants to conduct the search in the library—rather than in their usual place for searching that may present different conditions—and in the presence of search intermediaries (i.e., librarians), which is a situation participants do not experience on a regular basis, if at all.

Experiments usually focus of studying the effect of one set of variable on another in which all variables can be measured. The effects of elements that are complex and cannot be easily measured—such as goals of a task, priorities of the searcher and use of strategies—are difficult to investigate through experiments. Their investigation is usually carried out through naturalistic studies.

*Naturalistic studies*

The opposite of a lab experiment is the *naturalistic study.* In a naturalistic study researchers exercise no control over the elements that shape seeking behaviour. They observe and investigate the behaviour as it occurs in the field and in natural situations, that is, when participants perform their regular activities—such as, people searching the web in a public library, engineers evaluating a stream of documents they received from a current awareness service and individuals working together to solve an information problem. Researchers usually aim at being as unobtrusive as possible, and employ various methods to that end, so that study participants behave as naturally as possible. The ultimate method to achieve this goal is to become one of the study participants, that is, to become an ethnographer[[3]](#footnote-3). While an acceptable approach in anthropology where researchers may spend a long time to become a part of the group they study, ethnography is almost impossible in HIB research. Exceptions are cases in which the researcher is already one of the participants under study or a part of their natural environment. Solomon (1993), for example, volunteered regularly in an elementary school media center and at the same time studied the seeking behaviour of students when they searched the online catalog. Similarly he studied information behaviour of a team while he was its facilitator and record keeper for three years (Solomon, 1997).

Naturalistic studies always take place in the field. Unlike experiments, which are designed mostly to test associations among variables, naturalistic studies are diverse in their goals and design. They are conducted to uncover elements in seeking behaviour and elements that affect it, to record a process through a longitudinal study, to richly describe seeking behaviour of a group of users, to uncover associations among elements and for other purposes. Their design includes instruments such as interviews, field observation, analysis of existing documents that relate to the study, diaries and reports that participants compose during the study period and short questionnaires. Researchers often employ a network of instruments in one study[[4]](#footnote-4). Study design in naturalistic studies is crafted to fit not only the goals of the study but also the conditions under which the study will take place. These include issues such as access to participants and information related to them, privacy and confidentiality, physical structure of the field and willingness of people to participate in the study.

*Surveys*

In addition to experiments and naturalistic studies, which usually include a relatively limited number of participants, HIB researchers conduct surveys. A survey is the collection of information through responses to questions posed to a sample of individuals selected from a relatively large population. While usually researchers cannot control the conditions under which the participants respond, they control the questions and quite often the possible answers.

*Strengths and weaknesses*

Being opposites, the strengths of the experiment are the weaknesses of the naturalistic study and *vice versa*. The major advantage of an experiment is the high level of control which greatly reduces the level of complexity researchers face. With reduced complexity they can focus on the elements of interest and produce crisp results. Consider the Palmquist & Kim’s (2000) experiment described above. If the participants were asked to search two of their own requests rather than the two that were assigned to them, how would it be possible to determine whether the difference in searching time was affected by their cognitive style or by the type of requests they searched? That is, it would have been unfeasible to arrive at crisp findings in relations to search time. In general, the more relaxed the control of elements, the more difficult it is to arrive at crisp results about associations among elements. Therefore, naturalistic studies are seldom designed to test such associations.

Experiments are particularly valued by positivist researchers because: (1) they investigate only the observable, (2) they are assumed to be objective and therefore scientific and (3) they can be replicated and thus tested. They are guided by a *reductionist* approach—an approach that reduces the complexity of the object of study by disregarding the complexity inherent to seeking behaviour. Naturalistic studies can be reductionist as well but they also facilitate the application of a *holistic* approach—an approach that investigates seeking behaviour and its environment with their complexity.

The weaknesses of the experiment stem from its reductionist nature. In particular, one may ask: If complexity is not considered in an experiment and the conditions under which it is conducted are artificial, how can we guarantee that the findings are valid to real life which is complex by its very nature? Thus the ability to consider complexity, and introducing no artificial conditions, are the major advantages of holistic, naturalistic studies. At the same time naturalistic studies require much interpretation and analysis to obtain consistent findings—findings that are most often deep and complex. Researchers frequently employ qualitative research methods to arrive at this type of findings (Fidel, 1993).

In addition to their distance from real life, lab experiments are limited in the type of elements they can investigate. Behaviour-shaping elements that are not easily measured or cannot be reliably controlled—such as the interest of the participant in conducting the experimental task, the anxiety level of the participant when being watched, the nature of the participant’s seeking experience and searching style—cannot be harnessed to an experimental setting. In contrast, naturalistic studies are not inherently limited to the type of element to be investigated, even though practical considerations may at times limit access to particular elements.

Robertson (2008) explained the limitations of experiments in studying seeking behaviour:

Any laboratory experiment is an abstraction, based on a set of choices: choices to represent certain aspects of the real world (directly or indirectly) and to ignore others. Choices are made deliberately for the end in view—to isolate certain variables in order to be able to understand them. But choices are also made perforce—because certain aspects of the real world are highly resistant to abstraction. This factor introduces inevitable biases in what is studied: some groups of variables are more amenable than others to abstraction into laboratory setting. From this point of view, the most important grouping of variables in the IR field is of those that directly concern users and those that do not. On the whole, user variables are resistant to abstraction. (p.100)

Given the weaknesses of both experiments and natural studies, one may ask: Which one is better? Regrettably, there is no universal answer to this question, except for ‘it depends on the specifics of the research project and that of the researchers involved.’ Many factors, and combinations of factors, determine which study design is better. For example, a study of elements that are not likely to be affected by the conditions under which they are investigated—such as eye movement when reading a screen, the association people make between an icon and a set of concepts or the comprehension of error message—is a good candidate for an experiment because it is unlikely that a study in the natural environment would arrive at significantly different findings. Similarly, when the intention of a study is to produce crisp results, an experiment is preferred.

An important consideration when designing a study is the assumptions researchers make, explicitly or implicitly. For instance, when researchers select the elements to be tested in the lab they assume that the effect of these elements overrides that of the other behaviour-shaping elements. Palmquist & Kim’s (2000) study, for example, is based on the assumption that students with the same cognitive style and level of experience would behave as they did in the experiment if they have searched their own questions, searched at home or were graduate students at a European university. That is, the effects of cognitive style and experience on seeking behaviour override that of other elements, such as the source of the query, the location, the level of education and the system under which it is acquired. Such assumptions would be rejected by philosophical stances that see the environment in which people act—whether physical, social, educational or of other types—as instrumental in shaping human behaviour.

*The range of levels of control*

Given the limitations of both the experiment and the naturalistic study, several researchers reduced the level of control in their experiments to decrease the gap between the experimental conditions and real life. Similarly, when conducting naturalistic studies researchers introduced some artificial elements to increase the likelihood of obtaining crisp results. Experiments were modified in various ways, such as asking participants to conduct their own requests—rather than simulated ones—and eliminating constraints commonly used in experiments (e.g., time for searching, the search engine to use and the search starting point).

Naturalistic studies have invited a large variety of controls in order to produce some crisp results. An example of a naturalistic study with a limited degree of control is a study carried out by Kelly (2006a). She embarked on a longitudinal study to identify aspects of context that should be considered when investigating information seeking. She focused on the contextual aspects of *task* and *topic* and developed measurements for some of their attributes (e.g., endurance and stage for *task*, and persistence and familiarity for *topic*). Seven PhD students participated for a period of 14 weeks. During that time, the students were engaged in their regular work and looked for information using laptops given to them that recorded their searches. Once a week each student met with Kelly to fill out a task and topic questionnaire in which they reported and updated the tasks and topics in which they were involved and rated on a scale each one of them according to the attributes that were defined. At the end of the research period the students participated in an exist interview. The ratings the students provided for the *task* and *topic* attributes were then analysed statistically to arrive at crisp results[[5]](#footnote-5).

**Instruments for Data Collection**

Common instruments for data collection in HIB research are:

* Observation (the researcher “witnesses” the phenomenon of study as it occurs via the use of the five human senses),
* Interview (an instrument that contains questions which are asked by an interviewer in an in-person or over the phone),
* Questionnaire (a instrument that contains questions that is self-administered),
* Notes (that a researcher takes during the progression of a study),
* Documents (that can be collected such as transaction logs, reports, memos and diaries completed by the participants).

Two of these instruments—interviews and questionnaires—can be employed in all three methodss: experiments, naturalistic studies and surveys. In fact, they have been the most common instruments in HIB research (Wang, 1999), and they are discussed below.

*Interviews*

Almost all naturalistic studies that are holistic employ interviews to collect data from participants and other stake holders, and an increasing number of experiments conduct interviews, which are usually short. Surveys, unless they consist of a very small number of questions, avoid the use of interviews if only because of the high resources that would be required to conduct them. Interviews provide data that cannot be accessed in any other way, such as goals of a task, informal organizational structure and participants opinions about their seeking behaviour. Researchers can exercise control when conducting interviews through two channels: the structure of the interview and the nature of the questions asked.

The highest level of control available for interviews is provided by an *interview schedule* in which the interviewer follows a standard list of prepared questions for all interviews without any deviations. While the participants are free to respond as they wish, they all respond to the same questions. This promises some degree of uniformity in the topics the participants discuss, which in turn helps to collect data that are focused on the research questions. An interview with a *general interview guide* follows a checklist of issues to be addressed, rather than a list of specific questions. This type of an interview provides interviewers the freedom to select the questions and to follow participants’ responses with additional questions. The *informal conversation* provides interviewers with the highest level of flexibility: They generate questions spontaneously during informal conversations with participants[[6]](#footnote-6).

Another method to gain control in interviews is to ask *closed questions*, that is, questions to which the range of responses is highly limited. Examples of such questions are: Do you access the web at home or in school? Do you think that the web is good for surfing but not for searching? From among the searches you have just performed, which one was most successful? On a scale from 1 to 7, how would you rate your satisfaction? With closed questions the researcher obtains crisp responses which are usually directly amenable to data analysis. When researchers are interested in a deep understanding of seeking behaviour they ask *open-ended questions*, that is, questions that encourage the participants to include in their responses the complexity they think is required. The closed questions in the example above can be asked as open-ended questions: Tell me how you access the web. What is the web good for? How do you feel about the searches you have just performed? How satisfied are you? Open-ended questions allow respondents to express their opinions fully and also add explanations to their responses if they wish. While open-ended questions are commonly used in both experiments and naturalistic studies, surveys almost always include closed questions.

Many of the interviews in HIB research—whether in naturalistic studies or experiments—have followed a *general interview guide* and have asked open-ended questions. To conduct an interview by following a general guide (rather than a set list of questions), and to compose on-the-spot questions that are truly open-end, require much training. Both do not come naturally to people in Western cultures.

*Questionnaires*

Questionnaires are similar to interviews with *interview schedule* and closed questions. Questionnaires achieve the highest level of control among studies that collect data from participants through their responses to questions. A typical questionnaire consists of multiple-choice questions sprinkled with areas for comments. Data analysis is based mainly on the responses to the questions which are analysed quantitatively. Paper-based questionnaires were almost the only research instrument employed in the early HIB studies. Today, survey questionnaires are usually delivered through the internet. Electronic delivery has many advantages, among them: researchers can access a relatively large population that may provide a reasonably-sized sample and the participants responses are transmitted directly to software for statistical analyses[[7]](#footnote-7).

**Level of generalization**

All HIB studies aim at investigating the information behaviour of human participants. The desired level of generalization is one of the aspects that are considered in decisions about whom to recruit and how many participants in a sample. On one extreme are studies that seek to produce results that hold true for all human beings. Such studies usually collect quantitative data and employ statistical rules and analysis. On the other extreme are case studies that investigate one case—which may be a certain person in a situation, a class of students working on a set of specific assignments or a particular organization. In between these extremes are almost endless possibilities to create the boundaries around the population for which study results are valid. The first wave of HIB research projects studied seeking behaviour of well defined groups such as engineers, scientists, health workers and university students. While limited to a group, in the main these studies claimed to hold true for all members of the group.

The boundaries of groups began to shrink when HIB researchers embraced the study of seeking behaviour *in context* (see Chapter 3 ‘Information Behaviour and Seeking’ for more information). In-context studies have focused on specific groups, such as students in a particular university (George et al., 2006), the use of mobile information systems by police (Allen, et al., 2008), people in the state of increasing dependence and disability (Williamson & Asla, 2009) and female police officers involved in undercover prostitution work (e.g., Baker, 2004). Because in-context studies are context-dependent and cannot generalize, the aim of these studies has been to understand the seeking behaviour of the participants and to uncover themes that may be relevant to other studies.

Most studies that aim at universal generalizations may claim to predict future behaviour. This is particularly the case with experiments because they assume independence of external elements and thus resistance to future changes in elements that have not been controlled. Similarly, most associations among variables that were derived from statistical analyses are assumed to survive in future behaviour. These studies are *descriptive* in nature; they describe the behaviour itself. Most HIB studies have been descriptive but not all claimed to have predictive power. A large majority of them aimed to describe the phenomenon they investigated but for other reasons rather than prediction, such as improving the understanding of the phenomenon or for building theories. Some HIB studies are not descriptive but rather *normative*—they conclude what *should* be done. Xie (2006), for instance, investigated the criteria users found most important when evaluating digital libraries and found usability and collection quality to top the list. She suggested then that these criteria should serve as norms for the design of digital libraries.

**Nature of data and analysis**

It is customary to distinguish between quantitative and qualitative studies with regard to both data collection and analysis. Quantitative studies collect numbers and/or text and analyse them numerically. Qualitative ones collect and analyse text to arrive at findings that are expressed in text. Studies that collect quantitative data are limited to quantitative analysis, whereas those that collect qualitative data provide for both methods of analysis.

The most acclaimed advantages of quantitative studies are their ability to bring evidence of associations among elements and to provide universal results[[8]](#footnote-8). Among the advantages of qualitative studies are their ability to conduct in-depth investigations and their usefulness in exploring areas that have not been investigated before. Experiments in HIB have usually been quantitative studies that aim at universal generalizations. Naturalistic studies, on the other hand, commonly collect qualitative data.

Given the limitations of quantitative as well as qualitative methods, HIB researchers have began to consider studies in which both approaches are used together so that one overcomes the challenges presented by the other. Such studies are called *mixed methods* studies (Fidel, 2008). An example of a mixed method study is an investigation of the effects of various dimensions of tasks on the information seeking process. To identify task dimensions, Xie (2009) asked participants to write information interaction diaries which she complemented with telephone interviews. Once the dimensions were defined, she statistically described the relations between these dimensions and characteristics of the search process such as user plans, strategies and change of goals.

**Method of reasoning**

HIB studies have been either inductive, deductive, or both. In inductive studies researchers analyse the details and specifics with no a-priori structure or theory to discover patterns, themes and interrelationships. Deductive studies are guided by a-priori structure or theory. Studies may also use both methods of reasoning shifting from one to the other as a research project progresses. The inductive approach is sometimes called a bottom-up approach and the deductive a top-down. Most experiments and studies employing questionnaires are deductive because researchers make decisions about the experimental conditions, the measurements to be used and the questions to ask before a study begins. Similarly, studies for hypotheses testing and those that collect quantitative data are deductive. Naturalistic studies and interviews may also be deductive as when researchers follow a methodological or conceptual framework that guides the procedures to follow in the field and the questions to ask in an interview. Each method of reasoning has its advantages. Following a-priori structure, deductive design provides methods and approaches that help to harness complexity. At the same time, deductive designs are often resistant to change when study conditions develop in an unexpected direction. Their design is fixed. Inductive studies, on the other hand, can adapt themselves to new situations—that is, they can have an open design.

**Study contributions**

Most studies are carried out in order to provide contributions that will improve human condition in some way. HIB studies usually aim at contributions to research, to systems design or to both.

*Implications for research*

In general, each HIB study offers some contribution to research. While a typical research report explains the study’s contribution, researchers may glean additional information that is relevant to their work. Contributions to research, therefore, may take various forms. Many reports have explained that the study had increased the understanding of the investigated behaviour, and several have even pointed to the specific contributions. Another type of contribution to research have been studies that were designed to test certain research methods with the aim of finding effective methods to study complex questions (e.g., Kelly, 2006a,b). Several studies, however, were designed to develop new theoretical constructs such as theories and models. Some of these are described in Chapter 3 ‘Information Behaviour and Seeking.’

*Implications for design*

Many HIB researchers desire their studies to inform the design of information systems, and numerous study reports have claimed to offer ‘implications for design.’ However, very few reports have added specific design requirements. Even with such requirements it is not clear to what degree HIB studies have affected the design of information systems, and particularly IR systems. There are many barriers that block the direct use of HIB research findings in systems design, among them are the predictive power of the findings and their level of generalization. The design of IR systems had followed a normative process aiming at certain standards in system performance: high recall, precision and efficiency (see Chapter 4 ‘Evaluation’ for more details about performance measurement). Yet, most HIB studies are descriptive, offering no norms for design[[9]](#footnote-9). In addition, descriptive studies provide a snapshot of seeking behaviour at the time of the study, before a new and improved information system is installed. Because seeking behaviour is strongly shaped by the information system in use, such descriptions cannot predict user behaviour with the new system—a behaviour that should guide the design. Another mismatch is the focus of research: HIB investigations study searching as a *process* while IR is dedicated to *outcomes* with no consideration of the process.

Most IR systems are designed to be universal—fit for all humans—as are most of the current search engines. Many HIB studies, however, cannot be generalized to all potential users and under all possible conditions. This is clearly the case with in-context studies, which are growing in number and usually aim at describing seeking behaviour of a specific group of actors without considering generalizations. Thus, while HIB research is directed towards context-specific information systems, very few of such systems are to be found. Moreover, the validity of many HIB studies that claimed generalizabillity should be carefully considered as many of them have derived their samples from the academic population, and most often from the students in their department or university.

**Conclusions**

Complexity reigns seeking-behaviour research. Seeking is a complex and dynamic process as are the people who are involved in it. As a result, selecting an approach for a study is a complex decision. Adding to this complexity is the fact that no rules exist about the selection of approach but only general guidelines, and the trade-offs that exist among the many options make it difficult to arrive at a perfect decision. The dimensions of research that are discussed here, as well as other dimensions, can support the decision-making process: researchers can weigh each of them and consider the effect their decision would have on the study they design.

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1. The findings showed that difference in performance was significant for novice searchers with different cognitive styles, but not for experienced ones. [↑](#footnote-ref-1)
2. Such experiments are sometimes called *natural experiments*. It is better, however, to use the term *field experiments* and to preserve the term *natural* for naturalistic studies. Experiments by their very nature are not naturalistic. [↑](#footnote-ref-2)
3. The term *ethnography* is erroneously used by most researchers to designate any field study. However, this term is reserved for studies in which researchers are part of the group of participants. Confusion also occurs in the use of *participant-observation*. Even though there are various levels of participant observation, and not all require complete participation, it is common to erroneously use the term interchangeably with *ethnography*. [↑](#footnote-ref-3)
4. One of the first to craft a rich network was Allen (1977) who investigated the information behaviour of engineers and introduced the concept *gatekeepers* to Information Science. [↑](#footnote-ref-4)
5. The results of the study pointed to the relative importance of various measures of *task* and *topic* and the relationships between these measures (Kelly, 2006b). [↑](#footnote-ref-5)
6. These types of interviews are also called *structured, semi-structured and unstructured* interviews respectively. [↑](#footnote-ref-6)
7. Internet delivery is not without methodological challenges which are not discussed here. [↑](#footnote-ref-7)
8. Quantitative studies can also deliver a snapshot of the state of affair through descriptive statistics. [↑](#footnote-ref-8)
9. It is not uncommon for studies that aim at providing such norms to simply translate their findings into norms. That is, if they found that the participants liked X, the requirement would be ‘have X in the system.’ [↑](#footnote-ref-9)