

Research and practice: a critical reflection on approaches that underpin research into people's information behaviour

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Structured Abstract:

Purpose – The purpose of this paper is to provide a critical discussion on the nature of research into people's information behaviour, and in particular the contribution of the phenomenological approach and the significance of these approaches for the development of information solutions.

Design/methodology/approach – The approach takes the form of a conceptual analysis drawing on the research literature and personal research experience.

Findings – The paper brings to the foreground the relative value of different conceptual approaches and how these underpin and relate to the development of information solutions.

Research limitations/implications – The paper, due to the breadth and complexity of the subject, serves to highlight key issues and bringing together ideas. Some topics deserve further explanation. However, this was beyond the scope of this paper.

Practical implications – A conceptual framework is provided that indicates the value of the epistemic spectrum for information behaviour studies and provides support for action research and participative design.

Social implications – Taking a phenomenological approach, and consequently either a first person approach and/or a highly participative approach to research, challenges the relationship between researcher and respondent. It also raises questions about why we conduct research and for whom it is intended.

Originality/value – The paper makes explicit the underlying philosophical assumptions and how these ideas influence the way we conduct research; it highlights the significance of Cartesian dualism and indicates the significance of these assumptions for the development of information solutions. It supports the view that researchers and developers should be open to respondents leading the exploration of their needs.

Keywords: Information behaviour, epistemology, methodology, phenomenology, social constructivism, action research, participative design

Article Classification: Conceptual paper

Introduction

This article provided an opportunity to reflect on research into people's information behaviour and, in turn, to attempt to clarify the range of approaches and associated methodologies and research techniques. As Marcia Bates states (1999, p.1043): 'We

[information scientists] *need to become more fully conscious of the research and practice paradigm from which we operate ... much of the paradigm of any field lurks below the water line, largely unconscious and unarticulated, even by its practitioners ...*’.

It should be noted that certain ideas in this article have been discussed before outside and within our field, such as Budd (2005) and Wilson and Savolainen (2013). However, this paper takes the discussion further in identifying the characteristics and implications for both research and practice of different epistemic orientations, and highlights the significance of Cartesian thinking and value of non-Cartesianism. A framework is put forward that attempts to highlight these distinctions and the relevance of these theoretical orientations for research and the development of information solutions. In essence, this article is about the ontological and epistemological assumptions we make about the nature of reality, what we can know and how we know it (Willig, 2001), in relation to information behaviour. Information behaviour is assumed to encompass cognitive, physical and social activities (The behaviour, 2009) and is understood to address the many ways in which humans interact with information (Bates, 2010) and as *‘the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking and information use’* (Wilson, 1999, p.249). This article highlights the significance, for information behaviour research, of the fundamental distinction between research that assumes the Cartesian split between mind and body, and on the other hand, research that does not follow Cartesian thinking. The former includes the positivist and post-positivist orientations and the latter includes the phenomenological orientation, although different interpretations of phenomenology span this divide. The explanatory value of these different approaches and the implications for methodology and the choice of techniques that are used to gather and interpret data about people’s information behaviour are discussed. In conclusion, an argument is made for more emphasis on the phenomenological approach, particularly in the development of information solutions. Nevertheless, the strengths of the analytical, positivist and the post-positivist paradigms are recognised, particularly for the exploration of fundamental variables that are defined by the discipline, and the management of information solutions that follow but are, necessarily, simplifications of a complex human phenomenon that may only be fully appreciated through personal experience.

Approaches to studying people’s information behaviour

Bortoft (1996) argues that there are two major modes of human consciousness, analytical and holistic. The analytical mode of consciousness, which developed from our experiences of perceiving and manipulating solid bodies, emphasising distinction and separation, is sequential and linear, and is associated with logic, for example mechanical causality (Bortoft, 1996). The fundamental characteristic of this world view is externality. A belief in the Cartesian split assumes a separate external world that can be objectively known. This conception sees the world as existing independently of the mind. As with the external world, so too is the mind perceived and described as a quantitative phenomenon (Bortoft, 1996). Authors have argued that this mind-body split has not been acknowledged by the majority of researchers in information studies (Budd and Anstaett, 2013).

Complementary to this analytical mode of consciousness is the holistic mode of consciousness. This is perceived as '*nonlinear, simultaneous, intuitive instead of verbal-intellectual and concerned more with relationships than with discrete elements that are related*' (Bortoft, 1996, p.63). This approach will be discussed below. First, the argument turns towards the analytical mode of consciousness.

The analytical frame is exemplified by the natural sciences that tend to predict and explain natural phenomena through '*experimentally controlled observations of material entities*' using '*semantic and mathematical concepts whose referents are material ... and assumed to transcend particular settings*' (Kagan, 2009, p.33). This worldview has been categorised as positivist and empiricist and has underpinned the rapid development and application of ideas in the sciences, with extraordinary achievements in the natural sciences, and breakthroughs in medicine and health and engineering and construction. This approach is characterised by the ability to generalise and make reliable predictions.

The nature of language, that is being used in research on information behaviour, reinforces or stems from this orientation where noun (object) follows verb e.g. to seek information; to define information needs. The phrase 'information behaviour' lends a tone of externality, observability, and focuses on the study of others and is, perhaps to some extent, distinct from information experience which implies people's own, personal, interpretation of their individual information experience. Information and needs tend to be given an external, objective and concrete sense; an existence separate from the acting, perceiving being. This orientation tends to be associated with quantitative studies and with analytical techniques such as statistics and technologies that help analyse and/or manipulate discrete phenomena, such as the Statistical Package for the Social Sciences (SPSS). Methods for gathering data include, for example, surveys, such as information needs surveys where respondents are asked to prioritise categories of information. The analysis of information seeking behaviours through gathering usage statistics highlights behaviours such as use of information retrieval commands or sources – which in turn allow researchers to make generalisations about the habits of information seekers. These can be tabulated with other variables that are perceived to be important such as gender, role, experience etc. Experimental tests may be used, drawing on research in psychology, to categorise states of mind or mind 'quality'; this includes personality, for example the Myers Briggs Test, or short term memory, such as the Automated Operations Span Task (Bühner *et al.*, 2006) and are related to information seeking and use behaviour. These exercises can determine broad correlations between factors and have predictive value. The aim of such research is to determine fundamental variables that allow generalisations to be made. This in turn could influence the design of information provision and enable access to information and learning, for example determining the heuristics for accessibility design and adaptive interfaces that respond to user profiles. In this research context, qualitative data is either seen as a stepping stone to quantitative generalisation i.e. exploratory, or it is seen as a way to get a better understanding of the subjective experience of the individual or group. It is used to add context to quantitative data, for example to help explain why certain observed behaviours occur, by drawing on people's own explanations of their behaviour.

Quantitative data, for example on people's choice of information artefacts, can inform us about their reading habits and may affect the decisions made by content providers. Technologies such as collaborative filtering, may enable an information provider to suggest texts to the reader. Eye tracking while a person accesses the World Wide Web may help determine patterns of viewing text and images and lead to improved interface design; network analysis can highlight patterns of people's interactions and communication indicating the dynamics of the communication; the analysis of Twitter feeds, 'big data', via natural language processing, can be used to identify changes in sentiment across a population (Sykora *et al.*, 2013). Such methodologies may be used to make broad generalisations that organisations use to help indicate possible attitudes that could predict people's actions. Similarly, deep log analysis has been used to understand information seeking behaviour (Williams *et al.*, 2008), for example the browsing habits of students. This has thrown light on their information competencies, or the lack of them, and suggested a need for information competency building interventions. Data gathering technologies are also having their impact on this type of research, partly because of their current affordability, such as brain scanners, heart monitors and skin conductance are used to correlate information behaviour with changes in physiological data, such as frustration, excitement etc. while viewing information (Schachter and Singer, 1962). These studies are valuable and enable types of information behaviour and factors affecting information behaviour to be identified and understood. However, it is researcher-led and tends to focus on certain phenomena within a pre-defined framework and may overlook or misinterpret aspects of the information experience.

Post-positivist, post-structuralist, post-modernist and interpretivist orientations tend to be influenced by a belief that 'reality' or interpretations of the world, although external, is mediated, subjective and is in a constant state of flux. The degree to which these interpretations reflect or imply a 'true', concrete, external reality and the capacity for the person to perceive this vary according to the orientation of the researcher. Interpretivist explanations tend to follow a continuum in terms of access to and a belief in an objective, knowable reality and include epistemologies such as critical realism, cognitive constructionism and social constructionism. The latter two have contributed a great deal to research into people's information behaviour. Each makes their own assumptions about knowing and they embody abstract factors that are assumed by the discipline to be explanatory. Generally, there is a belief that research can objectively interpret and explain the world and so expose the layers of, for example, historical change, the operation of power, the implications of gender or being part of a specific community who share a common experience. Perceived cognitive characteristics, such as learning style (Mutschewa, 2007; Ford, 2004; Walton and Hepworth, 2011), are seen as factors that may condition or influence patterns of sense-making and people's interaction with information. Cleland and Walton (2012) in their work on online peer assessment indicate how evidence of students' thoughts about a topic can be externalised and insights into their learning can be demonstrated through their online discourse. As Law (2004) argues, these approaches amplify particular patterns and relations, bundling together phenomena to produce an organised reality.

Social constructivist, interpretivist, explanations and perceptions of the world and people's information behaviour are assumed, to be mediated through social constructs such as culture, community or organisation, where sense is assumed to be socially constructed (Berger and Luckmann, 1966) and part of observable reality. Context is assumed to be equally important as individual characteristics. These assumptions have given rise to studies that identify and give significance to the concept 'communities of practice' (Lave and Wenger, 1991). In other words, the study of people who cohabit a particular context (virtually or physically) which frames, constructs and is constructed through social interaction with others and is intertwined with the 'tools'/artefacts associated with their context and practice and learning. The community is associated with a particular situation, such as people with multiple sclerosis (Hepworth *et al.*, 2003), role or task, for example, informal carers (Hepworth, 2004), and shares common information needs, information values and information interactions. The focus of these studies is on *'the social and dialogic construction which underpins information seeking and use, as these activities are operationalized within a given setting, and according to the social conditions that inherently shape the setting'* (Moring and Lloyd, 2013, p.3). People's reality is assumed to be formed through their interaction with the community and the world they inhabit and their shared interpretation of it. These approaches move towards a more phenomenological approach that places emphasis on various ways of being aware or conceptions of a particular phenomenon and people's relationship with their perceived world.

Methodologies like grounded theory (Glaser & Strauss, 1967) have evolved that are thought to enable researchers to distance themselves from, or 'bracket', their preconceptions and help to better understand information behaviour from the respondents' perspective. The value of capturing language, stories and explanations of how practices happen over time, by exploring past critical incidents, are emphasised by researchers (Moring & Lloyd, 2013). For example, Marcella *et al.* (2013), in their study of oil and gas industry workers, argue that they avoid the trap of oversimplification by using storytelling, narrative enquiry and critical incident techniques to facilitate open and free discourse. This, in turn, enables participants to give real-life descriptions, in their own words, of how they experience their own information behaviour. Tools like qualitative data analysis software have evolved to help code, categorise and analyse the qualitative data (text, audio and image) that tends to be gathered through interviews and observation.

We have a long tradition of such studies of people's information behaviour in a variety of contexts (Fisher *et al.* 2005; Case, 2012). These can lead to broad generalisations, valued partly because they are empirically based, and models of people's information seeking that are assumed to characterise people's information behaviour in general (Wilson, 1999; Ellis and Haugan, 1997). They also lead to taxonomies of ecological factors (Williamson and Asla, 2009) that are thought to influence people's information behaviour, such as age or gender; or psychological states, for example levels of knowledge or intrinsic motivation, for example self-efficacy. Such studies, therefore, frame the study and reflect an 'analytical' approach that can be associated with the dualist distinction between mind and matter and yet allude to the conception of the complex and embedded nature of information behaviour and emphasise the significance of people's experience. As indicated above, these studies tend to value

qualitative data, pragmatist and mixed methodological approaches, including the collection of quantitative data or, in some cases, using quantification to indicate patterns in qualitative data.

In our field, a shift to a more interpretivist orientation, from the more positivist end of the spectrum, has been influenced by a feeling that people's information behaviour cannot be reduced to discrete quantifiable variables and that this would result in a radical oversimplification. This reflects the notion that people are 'unstable' and ever changing compared to our common perception of the physical/material world and where scientific methods originated. It is also recognised that interaction between the researcher and the respondent may have an effect on the data gathering process. Others have emphasised the complexity of people's information behaviour (Savolainen, 2012) and the range of intervening variables that imply that frames of analysis should be seen as valuable, but are, by nature, abstractions and simplifications of the lived and situated experience.

Reflecting on one's own information behaviour indicates this complexity. For example, in a short space of time [temporal data], while driving a car [environmental/task data]; positive thoughts [affective/cognitive data] about a topic for publication [communicative/artefact data] may skip and slide [cognitive data] between remembered [cognitive data] articles [source/artefact data]; personal learning experiences [cognitive and information seeking data]; the intended audience [environmental/social data]; the passing landscape [environmental/source data] triggering a metaphor [cognitive data]; conversations and meetings at conferences [social data]; email exchanges [communicative information behaviours data]; a related programme that happens to be on the radio [artefact data]; sudden insight [cognitive data]; time available [temporal data]; possible article structure [social norms data]; etc. etc. (others would probably code differently indicating the lack of universal nomenclature associated with information behaviour). Thoughts, emotions, behaviours, the physical environment, the information landscape; external expectations and norms; the social landscape, other people, the individuals one knows or social gatherings one may interact with, such as teams, organisations, the local community; current and past experience; individual practices, capabilities and tendencies etc. can therefore be when applying an analytical mind set. It could be argued, however, that any attempt to simplify (as indicated above) is by default a simplification of a holistic, intertwined, lived experience and yet it is useful but tends to assume an objective, potentially known reality, even though clouded by perception and often hidden to the ordinary person (Law, 2004).

Phenomenology focuses on how humans experience being and how people construct meaning and understanding in their lived experience. The phenomenological approach leads to a more holistic, qualitative understanding of experience and could be seen as bridging the Cartesian divide. Phenomenologists vary in their acceptance of Cartesianism. Husserl, reacting to a prevalent mathematical interpretation of the world, developed a particular form of phenomenology and emphasised the empirical discovery of the essence of phenomena, which may be shared amongst a community, and the bracketing of preconception (Budd, 2005; Wilson and Savolainen, 2013). He conceptualises an external reality, albeit embedded in place and context. Bortoft cites Schutz as epitomising this holistic approach by attempting to avoid reducing a phenomenon to the '*mere effect of a mechanism hidden behind the scenes*'

(Bortoft, 1996, p.33). A more radical interpretation of phenomenology put forward by Goethe, who preceded Husserl by one hundred years, influenced phenomenologists, in particular Heidegger, but also to a lesser degree Husserl. Goethe rejected the Cartesian paradigm. This required a shift, according to Bortoft, in consciousness and a move away from the analytical mode of consciousness. Goethe's approach to investigation was to understand the essence of phenomena, whereby the phenomenon '*discloses itself in terms of itself and therefore becomes self-explanatory*' (Bortoft, 1996, p.73). This implied trying to see the phenomenon in the simultaneous mode i.e. all at once (Bortoft, 1996, p.66).

One consequence of this is that to understand an experience one has to be embedded and a part of that experience and that '*first-person knowledge is fundamentally distinct from embodied consciousness*' (Budd and Anstaett, 2013). The phenomenon is not external to our minds and there is a mode of consciousness that does not separate mind and matter. This is difficult to fully comprehend due to the prevalence of the analytical mode of consciousness. From this phenomenological perspective the key is to experience phenomena as they come into being, rather than perceiving them as static separate entities. This implies that the outsider, the researcher, can never fully appreciate another person's experience or see the world through their eyes. This approach tends to echo Law's (2004) conception of research, where all sorts of assemblages resonate to produce truths in one way or another and may lead to insight into the essence of a phenomenon in all its complexity.

Nevertheless, although this approach assumes that self-study may be ideal, interpretivist authors have argued that through intense, participative, ethnographic research and '*prolonged engagement, persistent observation*' and the use of insiders or informants (Thomsen *et al.*, 1998) an understanding of others' reality can be achieved. It is also likely that the researchers would take their findings back to the community for validation. For example, Thomsen's study elicited rich, 'thick' personal stories captured via blogs on people using the internet to share information about health. Other studies that followed a phenomenological orientation include phenomenographical studies. These assume that if data is elicited in an appropriate manner, through interviews and analysed through rigorous, reflective, inductive analysis, the findings can reflect a group of people's perception of, for example, information literacy (Bruce, 1997; Bruce *et al.*, 2013). Smith's study of children's perception of information enabled, for example, levels of awareness and conceptions of information to be highlighted (Smith and Hepworth, 2012), indicating the most conscious conception of information was a thing and artefact, for example a book, place or person. The next most distant conception was information as a process of finding out; then internally storing and on occasion organising information, internally, for future use; followed by information as a way of creating new knowledge and, at the most distant form of awareness, thinking about information in terms of how it could be applied for a specific purpose – an order of awareness that one would want to reengineer when fostering people's information literacy. These conceptions are, of course, analytical abstractions yet it is assumed that application of the phenomenographical approach has enabled the identification of a person's conception of information that captures a perception of the respondent's experience. Budd (2005) cites Erdelez's 1996 work on

encountering and Foster and Ford's 2003 work on serendipity, as examples of phenomenological approaches.

In the international development context participative approaches and techniques (Chambers, 2002) have evolved, over the last twenty years, that place great emphasis on enabling the community to be more directly involved in the exploration of solutions that can address their needs. Tavares *et al.* (2011) and Tavares and Costa (2013) drew on these methods to explore information behaviour and information literacy with a marginalised community in Brasilia and acted, primarily as a facilitator who enabled people to explore this particular aspect of their reality and in that sense they were both participative and phenomenological. The Brazilian community chose to focus on situations that were important to them, for example health, transport and security. They then reflected on the role of information and identified information solutions, at the same time becoming more aware of how information could enable them to manage their experience. This led to the identification of information needs that were not expected, for example, the need to know about doctors' code of conduct and how this information could be used to advocate for better healthcare. This approach has an ethical and political dimension, since this leads to placing greater value than is usually the case on the participants who are seen as partners and, in a sense, the experts of their reality; a view shared by the critical realist perspective and is, in a sense overtly political and connected to notions of empowerment. Furthermore, the direction of the research is, to a greater extent than is generally the case, governed by the participants. Due to the emphasis on the view of the participants this approach tends to enable engagement, empathy and trust between researcher and participants because of the nature of the interaction where emphasis is placed on the researcher listening to and respecting the ideas of the participants (Quarry and Ramirez, 2009).

Such approaches have their critics. Neef (2003) provides a critique of the participative approach, and similar arguments could be used in relation to phenomenology. These include doubt as to the rigour with which data is gathered, for example the challenge of recording thoughts, discourse and context and that the influence of power relations within the community may be overlooked and lead to voices that are not heard. Furthermore, the tools used to capture participative or phenomenological research data may be alien to the participants, and lastly, highly participative approaches imply a high cost in terms of involvement and time from the participants. Nevertheless, Neef argues that these weaknesses maybe overcome if participative approaches are embedded in projects and take place over an extended period of time.

One of the most well developed methodology that reflects a move in the phenomenological and participatory direction is action research. The primary purpose of action research is to facilitate learning '*that is useful to people in the everyday conduct of their lives*' (Reason and Bradbury, 2006 p.2). This leads to research that '*is grounded in the perspective and interests of those immediately concerned*' (Reason and Bradbury, 2006 p.4). Action research projects are usually conducted over an extended period of time and, thus, experiencing phenomena 'coming into being' is more likely. Again the assumption is that knowing is experienced through face-to-face or online encounter with a person, place or thing; and through '*empathy*

and resonance' (Reason and Bradbury, 2006 p.9). These shared understandings are assumed to be richer, more holistic and to help appreciate the nuanced reality in a meaningful way that enables the researcher to connect with that reality and the embedded nature of people's information experience and one that relates to their priorities.

However, as mentioned above, a phenomenological research project following Goethe's philosophy, would stay faithful to the belief that one cannot see the world through someone else's eyes. Thus, to investigate oneself or for a community to investigate itself is the closest one could get to an enquiry into the essence of information behaviour. This could be facilitated by readily accessible devices including mobile phones, web cams, dictaphones, audio diaries, social media platforms such as Twitter, that have the potential to enable a person or community to capture and observe their thoughts, feelings and actions. This could lead to participative data analysis where participants sort and order data, and possibly use visual ways, such as graphic novels (Albright and Petrulis, 2014; Marchetto, 2009) and theatre (Nwadiuwe, 2012) which enable people to recreate and share perceptions of their multi-faceted information experience. Nevertheless, due to their ideographic nature, these approaches could be criticised, as indicated above, and raise questions about the generalisability of the insight of the researcher or the design of an information solution that is based on phenomenological insight. The phenomenologist, however, would argue that the whole can be represented or mirrored in the particular, and vice versa.

Discussion

This article has attempted to give an overview of the spectrum of ideas that may influence the way we learn about people's information behaviour. The distinctions between different approaches to research are often interpreted in different ways and the same labels are applied to different things. Nevertheless, one powerful distinction is between an acceptance or rejection of Cartesian dualism. This, in turn, can be associated with two ways of thinking, analytical and holistic, however, yet again these distinctions are blurred and the extent of their impact, in terms of the practice of researchers varies. Generally, the predominant paradigm has been analytical and tends to be associated with the positivist paradigm. Analytical thought is characterised by the categorisation of objects and events and the generation of immutable rules that determine the relationship between parts. The aim is nomothetic and associated with systematic description, explanation and prediction. The interpretivist perspective, it could be argued, inhabits a middle ground and tends to be ideographic and places great emphasis on context, the subjective nature of reality, but tends to be analytical in that pre-defined frames of analysis are used to highlight specific aspects of phenomena. Holistic thought places greater emphasis on intuitive understanding through direct perception i.e. empiricism. These distinctive ways of approaching the world can be seen to go back in time where in Grecian times, the analytical was favoured whereas in Asia the holistic became predominant (Nisbett *et al.*, 2001). The holistic paradigm has greater resonance with the phenomenological perspective and, at one extreme, rejects the Cartesian dualism.

The following table provides an overview of the epistemic distinctions described above including the Cartesian divide and the interpretivist/positivist distinctions. In addition, the significance of these distinctions for information behaviour research and the development of information solutions are highlighted. The value of these different approaches is outlined from both the perspective of the researcher and the practitioners who develop and manage information solutions.

Table 1: A conceptual framework summarising the epistemological and methodological choices associated with research into people’s information behaviour

Approach	Theoretical orientation	Applied purpose	Techniques and data
Positivist. A Cartesian, analytical perspective.	Knowledge of people’s information behaviour (information seeking, use and needs); tends to be hypothesis led and results in generalisations across a population, often in relation to demographics.	Enables design and ongoing management decisions about content and functionality e.g. Amazon’s collaborative filtering; tweet sentiment analysis etc.	Surveys, usage logs, interviews, focus groups, experiment. Primarily quantitative data (‘big data’) but also qualitative, focusing on explicit choices and behaviour often represented using statistical analyses. Researcher-led and persons studied are respondents rather than equal participants.
Post-positivist (Structuralist / Post Structuralist, Modernist), Interpretivist e.g. critical realist or social constructivist. A Cartesian perspective and emphasising the hidden nature of reality.	Knowledge of how people, often a particular community or people in a specific context construct and make sense of their information experience and provides insight into people’s information behaviour, often applying a theoretical lens or framework e.g. focus on power, situation or role to	Enables people-centred design; ongoing management decisions about content, functionality and look and feel, often related to information experience of people in specific contexts and communities.	Emphasis on interviews, focus groups, diaries, ethnographic studies, experiment (with talk through/self-reflection).Tends to emphasise the use of qualitative data (verbal and visual) but also in some cases quantitative, often gathered using mixed methods. Tends to be researcher-led although sensitive to the need to explore issues from the

	help explain information seeking use and needs.		respondents' perspective.
Phenomenological e.g. phenomenography, phenomenology (Cartesian and non-Cartesian). [The latter implies a different form of consciousness (Bortoft, 1996)]. Holistic in orientation.	Knowledge of how people experience information behaviour; often focusing on a particular community or people who share common context – focusing on the essential or archetypal nature of the phenomenon i.e. their information experience, possibly leading to categories of experience.	Provides insight into the participants' information experience from their perspective, indicating the implicit and the tacit that can feed into design. It may be combined with participative approaches leading to co-design and co-build strategies to develop information solutions.	Emphasis on interviews, focus groups, diaries, ethnographic and participative studies and also self-study. Qualitative data. Either research-led or participant-led (the latter would be the case for Goethe's form of phenomenology).

The positivist orientation is, therefore, associated with broad generalisations across a population on the basis of which decisions can be made, for example the management of an information resource that is designed to meet the broad needs of a population. Aspects of information seeking, such as access and downloads, and factors that may influence information behaviour and relationships between factors are identified, for example, location, age or role. To a great extent, behaviour is decontextualized. Data can be collected and analysed relatively quickly and cheaply using automated methods. It is unlikely, however, that such data will provide insight into the subtleties of people's information behaviour or their individual experience and could lead to false correlations and causal explanations. Such subtle nuances may distance people from generic information systems, despite their conformity to common standards. Nevertheless, these weaknesses may be ameliorated through the collection of qualitative data. The post-positivist approaches tend to be less concerned with common characteristics of a broad population and, due to an interpretivist orientation, focus on what is specific to the population or community. They also use frames of analysis deemed significant, for example, gender or practice and investigate how these shed light on social phenomena and information behaviour. The phenomenological perspective, may or may not explicitly reject Cartesian dualism but does not attempt to apply a predetermined lens and, because of its holistic orientation, attempts to capture the essence of an information experience in all its complexity, as perceived by the individual or a community.

Echoes of phenomenological thinking and holistic approaches can be found in other related domains such as requirements engineering, where the complex interplay between the physical, the individual, and the socio-cultural dimensions are recognised (Vicente, 2006; Mumford, 2006). We would argue that these ideas underpin participative approaches (participative design, co-design and co-build) (Lockwood, 2010; Dayton, 2009) that involve the audience in the design and development of information solutions that correspond to the potential users' reality and enable them to achieve their objectives. In software development approaches such as rapid prototyping, Agile and Spiral approaches all entail significant involvement from the audience. These new approaches, in our view, reflect the difficulty of 'accessing' another's reality and how this can only be achieved through some degree of immersion and the sharing of data that allows '*a sufficiently clear and precise knowledge of the underlying deviating system of relevances*' (Schutz, 1962 p.132, cited by Wilson and Savolainen, 2013).

Taking this thinking to its logical conclusion, information behaviour studies would be driven by the community who would explore their reality and learning, from an information perspective, and work towards developing their own solutions, drawing on external expertise when appropriate. Facebook is one of the few examples where people have designed and built a service to meet their own needs, and have had resonance with others who shared their needs, and epitomises the outcome of taking a phenomenological approach. However, working closely with the community is a more likely strategy for an information solution provider. For example, the approach taken by Gurses *et al.* (2009) who, as a result of shadowing, unstructured interviews and document analysis, gained insight into clinicians' information use and then developed appropriate solutions. Similarly, Madden *et al.* (2014), in a very different context, used participatory action research to explore the culturally appropriate use of information technology with Aboriginal women in Australia, and to reduce digital exclusion. In Denmark, the Urban Media Space Aarhus project (Dalsgaard and Eriksson, 2013) also indicates the value of the participative approach and how this can be applied on a large scale when developing a new public library. Nevertheless, the emphasis on such strategies does not mean that broad generalisations about people's information behaviour cannot inform the design of information solutions. For example, our knowledge about the generic characteristics of cognition and perception has influenced the design of accessible human computer interfaces.

Conclusion

This paper echoes Vakkari's (2008) call for more detailed studies of people's information behaviour in context and reflects the recent work of Savolainen (2012) and can be seen to be supported by current strategies taken in related fields.

It is likely that the analytical, positivist, perspective will continue to dominate academic discourse, and receive high rankings in academic assessment exercises. This perspective can help to identify perceived patterns within large data sets or, where intervening variables can be controlled and identify specific relationships between categories of data leading to broad generalisations. Whereas the analytical, interpretivist, perspective tends to focus on a specific theoretical agendas that are assumed to influence and explain information behaviour

within specific contexts. In this article, by highlighting the distinctions between different approaches, i.e. the analytical and the holistic and the implications of non-Cartesian ontology, we hope to have made more explicit the strengths and weaknesses of alternative strategies. In particular we have emphasised the value of the phenomenological approach that encourages a holistic, participative, context specific approach for investigating people's information experience and shown how they underpin the move towards an increasingly participative approach for developing information solutions. Such approaches do have their challenges. Service providers and developers may think that this devalues their knowledge, or have little faith in the capability of the community to be genuine partners. They may also be concerned about the uncertainty of the outcomes and whether only the loudest voice is heard. Project funders may share similar concerns. Nevertheless, these risks can be ameliorated through facilitators who are skilled in participative techniques. It is time consuming and challenging when undertaken on a large scale, although the Danish example indicates that it is possible and leads to effective, sustainable, solutions.

One other outcome of this shift in thinking is that a fruitful channel for further research may be to place more value on turning inward and exploring information behaviour from the researcher's first person perspective where they study their own information behaviour. This could lead to insight that may influence the design of information solutions.

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