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Enhancing conceptualisations of information behaviour contexts through insights from research on e-dictionaries and e-lexicography

Theo JD Bothma and Ina Fourie
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Abstract

Introduction. Extensive conceptualisations of context in information behaviour research do not extend to all contexts revealed in the use of electronic (e)-dictionary and similar e-sources. Information behaviour emphasises users' contexts and their situations. As intermediaries, examples of using e-dictionaries reveal additional contexts. E-dictionary research and lexicographical insight add additional conceptualisations of information behaviour contexts.

Method. Conceptual paper drawing on literature reviews of research on e-dictionaries and conceptualisations of information behaviour contexts, and an exemplar approach to e-dictionary use.

Analysis. The literature and dictionary use examples are analysed through an information behaviour lens with added lexicographic insight.

Results. Conceptualisations of context in information behaviour research strongly focus on the user (e.g. the need, problem) and specific situations in such contexts, sometimes extending to temporality and spatiality. Information retrieval literature also notes the context of the person who created information and of an intermediary (person or system). Three contexts are evident from e-dictionary use and lexicography: user, information intermediary (dictionary), and word, phrase or text (information source). These contexts might influence information behaviour.

Conclusion. The use of e-dictionaries and similar intermediaries, observed with lexicographic insight, can enhance conceptualisations of context in information behaviour, which is of value in the use of information sources and information evaluation.

Introduction

'Dictionaries are important, authoritative sources of information used to fulfil everyday life needs to understand words, their spelling, use and origin as well as to fulfil sophisticated subject-specific needs**'** (Bothma and Fourie, 2024). The advent of electronic (e-) dictionaries opened up opportunities for many people to use dictionaries whenever they need them, e.g. by using free dictionaries and dictionary applications (apps), in addition to commercial dictionary subscriptions. E-dictionaries are immediately available, anytime, anywhere (Huang and Tarp, 2021) and can, for example, be directly accessed from texts read through Kindle readers (Amazon books) that also offer opportunities to expand to web searches (Bothma and Gouws, 2020). Electronic dictionaries can be valuable to learners in everyday life and, in particular, to professionals in the workplace. Understanding how people use such dictionaries can infuse information literacy training (Bothma, 2018; Bothma and Fourie, 2024), but, as we realised through our research, conceptualisations of context in information behaviour research (focusing strongly on users' context) can also be enhanced (Bergenholtz and Bothma, 2011; Bergenholtz et al., 2015; Bothma and Fourie, 2024; Bothma and Gouws, 2020, 2022; Fourie, 2012, 2020). We will illustrate in this paper how this can be done.

Although there is a wealth of literature on information behaviour (Case and Given, 2016; Given et al., 2023) and, as is evident from papers delivered at Information Seeking in Context (ISIC) conferences, very little research has been done on electronic dictionaries from an information behaviour perspective. Exceptions are Bothma and Fourie (2024), Bothma and Gouws (2022), Bothma and Prinsloo (2013) and Huang and Tarp (2021). Extensive discussions have taken place on the importance of contexts in information behaviour research and conceptualisations of information behaviour contexts. Prominent work includes Agarwal (2018), who emphasises the information seeker (i.e. user), surroundings and environment, and shared identities; Cool (2001), who focuses on situations and context; Courtright (2007), who analyses interpretations of context in information behaviour research; Dervin (1997, 2013), who argues the complexity of context in information behaviour research – *'taming the unruly beast'*; Fourie (2012), who focuses on diversity and the multiple overlapping of contexts in palliative care, and on the contextual information behaviour of the analysis of grief and bereavement (Fourie, 2020); Johnson (2003), who focuses on contexts of information seeking, and the mapping of information behaviour with special attention to contexts, rationality and ignorance (Johnson, 2009); Savolainen (2012), who focuses on the conceptualisation of information needs in context, models of information interaction in the context of information seeking and retrieval (Savolainen, 2018a, 2018b), spatial factors as contextual qualifiers (Savolainen, 2006a) and time as a context of information seeking (Savolainen, 2006b); Sonnenwald (1999), who addresses contexts and situations in her work in information horizons; and Talja et al. (1999), who takes a metatheoretical view of context in information seeking. Albeit extensive discussions, there is still no agreement on the meaning of context. The intention of this paper is not to argue the concept, but to explore *types* of context. Information behaviour largely focuses on the user's context as we are illustrating in the section titled *'Literature review of conceptualisations of context in information behaviour, retrieval, practice and literacy research'*.

From searches in core databases such as Emerald Insight, Library and Information Science Abstracts (LISA), Library and Information Technology Abstracts (LISTA), Library Source, ScienceDirect and Web of Science, we could not retrieve work combining contexts noted in the use of e-dictionaries with views of information behaviour contexts that focus on the context and situation of the user. Earlier work of Ingwersen and Järvelin (2005) sensitised us to the possibility that current views of contexts that focus on the context and situation of the user, although very useful in directing information behaviour research, might be further enhanced to enrich information behaviour research.

Our paper is guided by the following main question and sub-questions:

> How can interpretations of information behaviour contexts focusing on user contexts be enhanced by considering research on e-dictionaries and lexicographic insight in the use of e-dictionaries?
> Sub-question 1: Which type of contexts feature in information behaviour research?
> Sub-question 2: How can we build a case from the literature and our experience in e-dictionary research to reveal additional contexts to be considered in information behaviour research methods?
> Sub-question 3: Which additional contexts are revealed in e-dictionaries research?

This paper reports on research in progress. It covers the clarification of concepts, background, our research methods, an overview of information behaviour, and information retrieval literature on conceptualisations of contexts, a brief mention of e-dictionary research, observational examples of the use of e-dictionaries, an analysis and a discussion, findings, recommendations and a conclusion.

Clarification of concepts

Since this paper is intended for experts in information behaviour research, we first present our interpretations of information behaviour and contexts before defining dictionaries and e-dictionaries. Lexicography is also defined.

Context as defined from current information behaviour research

The importance of context and contextualisation is widely noted in information behaviour research, e.g. Agarwal (2018), who argues that different interpretations of contexts offered by scholars such as Dervin and Courtright can hold value and be true since they depend on how one looks at it. For Wilson (2022, p. 16), context is the situation in which an information need arises. It is determined by the life-world of people, the multiple realities they experience in that life-world and its spatial structure. To this can be added time and temporality (Savolainen, 2006b). This is the context the person brings to the situation in themselves, which Schutz (as cited by Wilson, 2022, p. 18) terms the *biographically determined situation*. This is '*the sedimentation of all of man's previous experiences, organized in the habitual possession of his stock of knowledge, at hand, and as such is his unique possession, given to him and him alone*' (Wilson, 2022, p. 18). This interpretation reflects the strong acceptance of *user context* in information behaviour conceptualisations. In addition, the argument of Agarwal (2018) can be considered. He argues for a contextual identity framework that accommodates different, but all valid, views of context such as have been argued for the authors we mentioned. In his words:

> *What one concluded to be context depended on the view one was using to envision context. All views were true and co-existed, and were a part of the concept of context. They were just different ways of looking at the same thing. Depending on where you looked at it from, and what you focussed on, you would see different things… (p. 82).*

Information behaviour

Information behaviour refers to all information-related activities and encounters, including information seeking, information searching, browsing, information retrieval, recognising and expressing information needs, information encountering, information avoidance, information processing, information sharing and information use (Fourie and Julien, 2014). The definition was developed from the work of Case, Given, Savolainen and Wilson. The onion model of Wilson (1999) presents information retrieval as a more specific activity, which falls under the umbrella term.

Dictionary

Dictionary is defined in the Merriam-Webster online dictionary as '*a reference source in print or electronic form containing words usually alphabetically arranged along with information about their forms, pronunciations, functions, etymologies, meanings, and syntactic and idiomatic uses*' (Merriam-Webster, 2024a). A dictionary in electronic form is typically known as an *e-dictionary* or *electronic/online*

dictionary. When a reader reads an e-text (electronic text) in a browser (e.g. Google) or on an e-reader (e.g. Kindle) or a Kindle app, an e-dictionary can be accessed by clicking on a word for which the reader requires a definition – the software within the system links the word directly to the first word in the e-dictionary that corresponds to the word the reader selected.

Lexicography

Lexicography is defined in the Merriam-Webster online dictionary as '1: *the editing or making of a dictionary*; 2: *the principles and practices of dictionary making*' (Merriam-Webster, 2024b). E-dictionaries are typically very complex systems, with advanced search facilities, cross-linking between dictionary articles, sound, images, etc., and are created by a multidisciplinary team of specialists, including lexicographers, computer programmers, interface and UX (user experience) designers, information specialists, etc. This has given rise to the term *e-lexicography*.

Intermediary

In the information science literature, *intermediary*' has been used to refer to a person or a system (Ingwersen and Järvelin, 2005); both interact between a user and the information required or needed. Our use of the concept *intermediary* as an information source that helps solve an information need when reading a text links to the preceding definition. This can best be illustrated by an example. A person who is interested in, for example, astronomy, and has a good understanding of astronomy, would like to know more about a topic within this discipline, for example, dwarf stars. They have a fair amount of knowledge about astronomy and dwarf stars, and regard themselves as a knowledgeable lay person, but not an expert. To find the required information, they do an internet search and, after careful selection, download an article that deals specifically with dwarf stars. The information need is to find out more about dwarf stars. This need could be solved by the selected article. When reading the text, they come across a word of which they are unsure about the meaning, i.e. a secondary information need is triggered. This needs to be solved before the main information need can be fully solved. The reader then has to consult a dictionary for the meaning. The intermediary helps the reader to solve their secondary information need, without which the main information need cannot be solved. In this case, the dictionary functions as the intermediary. This is discussed in detail in Bergenholtz and Bothma (2011); also see Bergenholtz et al. (2015). It is also feasible that the specific word does not occur in the dictionary, which will result in a further search, for example, in another dictionary, in an encyclopaedia, or for an image, animation or video that illustrates the unknown word. All these information sources can act as potential intermediaries to help solve the secondary information need in a network of information tools, as discussed in detail in Bothma and Gouws (2020).

Method

For this conceptual paper, we draw on brief reviews of the literature from lexicographical work on e-dictionaries and conceptualisations of information behaviour and information retrieval contexts, as well as examples of the use of dictionaries, to illustrate our point. We refer to the latter as an exemplar approach. According to Bronk (2012), Damon and Colby (2013) and Smith (2022), exemplar methodology, although underutilised, can offer valuable insights, e.g. when studying outliers in education, human and other developments. Our choice of examples to illustrate our argument is pragmatic and – for this paper –we would not label it as a methodology, just an approach.

Literature review of conceptualisations of context in information behaviour, retrieval, practice and literacy research

From the extensive body of literature on conceptualisations of context and information behaviour studies, we cite only some of the core references where the word *context* appeared with terms such as *information needs*, *information seeking*, *information searching* and *information behaviour/behavior* in the title to show how information behaviour research predominantly focuses only on the context of the user(s). Such contexts include situations

requiring information or problem solving. Our choices were influenced by the work of Agarwal (2018), Given et al. (2023), Ingwersen and Järvelin (2005), Kelly (2006), Meyer (2016), Savolainen (2012), Sonnewald and Pierce (2000), Talja et al. (1999), Wilson (2022) and, in particular, the most recent work of Savolainen (2023) on everyday life as an evolving context of information behaviour.

Context has been associated with the environment, surroundings and settings, such as geographical location, e.g. country, city, region, urban vs rural, places or buildings that include the workplace, academia (Falciani-White, 2017; Fisher et al., 2004; Pettigrew, 1999; Stilwell, 2010). Savolainen (2006a) argues for space or spatial contexts, and Mervyn and Allen (2012) argue for sociospatial contexts that extend to connections and the use of social media. Digital and virtual spaces have also been linked to studies of context of information behaviour, such as the use of the internet, Wikipedia and digital platforms (Kari and Savolainen, 2004; Lieberman and Bar-Ilan, 2019; Savolainen, 1999).

Several information behaviour studies can be traced that report on context in association with diseases, violence and abuse, vulnerability, activities or tasks and movement (e.g. hobbies, leisure, occupations, writing, self-development) (Attfield et al., 2003; Chen, 2022; Fourie, 2012, 2013; Julien and Fourie, 2015; Kim, 2008; McKnight, 2006; Sabelli, 2012; Westbrook, 2008), responsibilities and commitments, such as patient safety (MacIntosh-Murray and Choo, 2005), phenomena such as fake news (Marcella et al., 2019) and ways of everyday life (Savolainen, 1995, 2023). Savolainen (2006a) also argues for time as context. Time or temporal contexts can apply to disease progress, the period before or after death, or the first or final year of study (e.g. Fourie, 2020). Wilson (2006) and Allen et al. (2011) reported on activity theory as a context. Social contexts, including group, team or collaborative work, have also featured in information behaviour studies (e.g. Reddy and Jansen, 2008; Sonnenwald and Pierce, 2000).

Contexts also feature in the literature of information practice and information literacy, but do not draw the same in-depth discussion on what context means. Information practice literature seems to focus on users and where they find themselves in contexts, e.g. workplaces (Jarrahi and Thomson, 2017) and everyday life situations, such as menopause transition (Yeoman, 2010). Savolainen (2021) applies his reflection on contexts of information practices to what he refers to as information landscapes – the information resources and support to which users might have access. Tabak (2014) makes an argument for jumping between context and users in some information behaviour literature, and the difficulty in tracing information practices. In conclusion to the paper, Tabak (2014, p. 2230) argues:

> *This article argued that positioning of contemporary IB [information behaviour] theories and models on a continuum between individual and collective is a crucial factor in the differentiation between them, but it also poses a major difficulty in studying information practices. On one side of the continuum, the object of research is defined as patterns of behaviour, and the focus is on information users; on the other side, information practices are understood as social and cultural phenomena…*

The framework of the Association of College and Research Libraries (ACRL) for information literacy emphasises consideration of contexts in which information literacy skills are applied and for which information literacy must be taught (Seeber, 2015), which is the settings, circumstances and environments where people (the users in information behaviour research) find themselves. Schreiber (2014) links educational tasks such as assignment writing in the context of information literacy to Schatzki's practice theory. In her work on information literacy, where contexts are emphasised, Lloyd (2005, 2010) also draws on practice theory. For Dorner and Gorman (2011), the contextual factors that affect learning in Laos and the implications for information literacy education include the physical setting, resources and cultural norms. For Fister (2017), context refers

to the higher education environment, where information literacy is taught. In their book, *Using context in information literacy instruction*, Hepworth and Walton (2013) portray contexts as the different settings, circumstances and environments where people apply information literacy and for which they need to be trained, such as educational, workplace and community contexts. Hicks (2021) takes a similar slant by focusing on workplace and employment contexts, e.g. information literacy in the contexts of governments or insurance firms. Such contexts can even include the context of rights at work (Šobota and Špiranec, 2022). Lundh et al. (2013) see context in terms of a workplace or educational settings where information literacy is practiced, while Raju (2013) extends the contexts where information literacy is practiced to the level of a continent, Africa, and the circumstances marking this continent. For Webber and Johnston (2017), context is also where people find themselves and where there might be cultural, financial and other influences in the context. Although with an overall stronger focus on place and environment, the interpretations of context in the literature of information literacy and practice do not add the additional types of contexts that we are suggesting.

Exemplar approach: use of dictionaries and e-dictionaries

Observations of the use of e-dictionaries reveal contexts other than those of the user that need to be considered. In the following paragraphs, we briefly discuss the use of dictionaries and e-dictionaries from a lexicographic perspective before presenting exemplars that demonstrate kinds of contexts to consider.

Dictionaries provide articles in which the meaning or sense of words are described, as is well known. Dictionaries also provide context markers to distinguish between different meanings or senses, e.g. grammatical information (parts of speech, declension or inflection forms, etc.), as well as labels to indicate whether a specific sense is limited to a specific variety of the language (e.g. British, North American, Australian or South African English), regional uses of specific words or meanings (e.g. Scottish or Welsh), labels for register (e.g. literary or informal) or discipline (e.g. chemistry or computing). Most dictionaries also provide example sentences to illustrate a specific sense in context. It is therefore evident that the context in which a word occurs has (or could have) a huge influence on its meaning. When someone needs lexicographic information, they have to understand the access structure of the dictionary, e.g. alphabetical under the lemma (headword), thematic (based on a number of themes with hierarchical sub-categories), etc. Once they access the relevant lemma, they need grammatical knowledge (e.g. which part of speech) to ensure that they access a lemma that seemingly corresponds to the required lemma, and not a homograph (e.g. *tear* as a noun, *a drop of clear, salty liquid*, or as a verb, *pull to pieces with force*). When the correct lemma is accessed, the user has to read through all possible meanings (or senses) to ensure that the selected meaning is relevant in the context of the information need (e.g. understanding the meaning of a word in a sentence). This could be time-consuming, as many dictionary entries could be very long. It remains the responsibility of the user to evaluate all possible meanings that could be relevant in the specific context of the word, and therefore solve the information need of the user. However, some users might decide not to work with such care and may think that they have solved the information need, but have not actually done so.

When one reads an electronic text in a browser (e.g. Google or Firefox) or on an e-reader (such as Kindle, or the Kindle app on a tablet or desktop computer), every word in the text is linked to a user-specified dictionary, and the first few lines of the dictionary article appear in a pop-up window when the reader [in preceding sections we referred to the user; when discussing the use of e-dictionaries, however, we prefer to refer to the reader] clicks on the word. The look-up process is therefore simplified, and the reader does not have to find the correct lemma by searching in the dictionary. However, at this stage, the reader is in the same position as they were when using a printed dictionary – they have to read the full

dictionary article to ensure that they identify the correct lemma, as well as the correct meaning of the word in context. One challenge for lexicographers and the multidisciplinary team of collaborators on e-dictionary projects (e.g. computer programmers, interface designers and information scientists) is to research to what extent this linking process can be automated to link to the correct meaning in context, i.e. not to simply link to a lemma, but to the correct lemma and to the exact point where the meaning in the context of the text the reader is reading is displayed. Obviously, this functionality would only be available in e-dictionaries, and not in printed dictionaries. This is, however, not the topic of this paper. This functionality highlighted the issue of context in a text, and the context markers in dictionaries. It is clear from the preceding discussion that the insight from lexicography that solving a lexicographic information need (i.e. understanding the correct use and meaning of a word) is linked to the context within the information source (the text being read), and the context of the dictionary that could satisfy the information need.

All the grammatical and labelled information in a dictionary entry is, in fact, metadata that limits the information that follows to the specific categories specified by the metadata. For example, in the phrase '*do battle with some very fly people*', the first *fly* lemma in the dictionary is a verb, indicated in the dictionary with *v.*. The second is a noun, indicated by *n.*. The third is an adjective, indicated by *adj.*, discussed in more detail in Bothma and Fourie (2024). Based on the reader's (assumed) grammatical knowledge, they should understand that the first two lemmata are not relevant in context, but the third one is correct. In the linked e-dictionary, the entry for the adjective lemma is given as in Figure 1.

fly[3] ***adj.*** (**flyer**, **flyest**) INFORMAL **1** BRITISH knowing and clever: *she's fly enough not to get tricked out of it.*
2 NORTH AMERICAN fashionably attractive and impressive: *a fly dude.*
<DERIVATIVES> flyness *n.*
<ORIGIN> early 19th century: of unknown origin.

Figure 1. The entry for **fly**[3] in the linked e-dictionary on Kindle

From Figure 1, it is clear that *fly* as an adjective would occur in an informal setting, and that the metadata indicating locality for the two meanings is geographical, i.e. either British or North American. From the dictionary, no further help in determining the meaning is forthcoming, and the disambiguation should be based on the context of the text. No markers are available in the text itself. However, the reader should be aware that the text is situated in Edinburgh, Scotland (based on references to Edinburgh elsewhere in the text). Therefore, the British meaning is the more probable meaning in context. To link from the text to fly[3], British meaning, the linking software should be able to determine that the word is an adjective (i.e. grammatical disambiguation based on part-of-speech analysis) and be able to determine from the context of the sentence, paragraph or book that the British meaning is the more probable one. This is obviously not a trivial task computationally, but is not the focus of this paper. From the example, it is, however, evident that the context of the text, as well as the context specifying the meanings in the dictionary, is of paramount importance to understand the text, and therefore solve the information need.

Linking from texts (be this from a browser or an e-reader) to online dictionaries is, in general, very successful in terms of identifying the

correct lemma. This functionality has been studied in a fair amount of detail in the past (see, e.g. Bothma and Prinsloo (2013), Bothma (2018), Bothma and Gouws (2020, 2022), Huang and Tarp (2021), Tarp and Gouws (2019, 2020), Vazquez and Gouws (2023), Bothma and Fourie (2024), etc). The linking is, however, not always successful, as has been described in detail in Bothma and Prinsloo (2013), who list the nature of the inaccuracies, and provide examples. This is also the case in some of the other publications mentioned here.

The dictionary functions as an intermediary between the reader and the text in solving the information need, as described earlier – the reader cannot solve the information need by themselves without consulting a dictionary (be this a print or e-dictionary). The reader can obviously decide to ignore the information need, or consult another intermediary, such as an encyclopaedia or other web resource, or ask a human being for the meaning. The role of an intermediary is indispensable if it is essential to understand the meaning of the word. In addition, understanding the context of the text (the source) and understanding the context of the intermediary (the dictionary) are both essential components of solving the information need. The question now is whether context in solving information needs can (and should) be extended to these entities as well. The context of the information user or seeker has been studied in great detail. A summary of recent research is provided earlier in this article.

A context perspective to the use of e-dictionaries: the context of an information user, a source and an intermediary

We acknowledge that users seek information in a context that can be defined by their workplace, a disease, task or activity – as explained in an earlier section. When using information sources and, in particular, e-dictionaries, other types of contexts are evident, as illustrated in the preceding section. We posit that understanding the contexts of both the information source (the text being read) and the information intermediary is essential for a broader understanding of the concept *context*. This is illustrated by a number of hypothetical (and not exhaustive) examples to show why the context of information source and information intermediary (if required) complement the understanding of the context of the information user. All these cases are simply examples of possible encoding, and not comprehensive, i.e. not the only such contextual attributes that can be encoded for them. These contextualisation items can be encoded in the form of attributes of the information user (i.e. the information user in a context, as explained earlier), the information source and the information intermediary, indicated in the codification with a +. (If the absence of a specific attribute must be encoded, this could be indicated with a -.) The use of encoding to identify the presence or absence of attributes of an entity is discussed in Bergenholtz and Bothma (2011). The encoding is used to match attributes, features or characteristics of, for example, the reader of a text, the text that they are reading, and the intermediary: in this case, an e-dictionary (or other intermediary, such as an encyclopaedia). This includes issues such as whether a reader (i.e. user) needs information for leisure reading or reading for a work task, whether the reader is an expert, semi-expert or lay person in a specific topic, the language proficiency of the reader in relation to the text that they are reading, etc. (see Bergenholtz and Bothma, 2011, p. 57–61). The examples list three different readers (each with their own attributes and contexts), three different types of information sources (also with their attributes and contexts) and three different types of information intermediaries (also with their attributes and contexts). In the section following these examples, a reader is linked to an information source and an information intermediary, in hypothetical situations. The process is described and illustrated in Figure 2. Further examples of possible requirements for matching attributes and contexts for readers, information sources and information intermediaries are given in Table 1.

The context of an information user (i.e. reader)

Context of an information user was summarised at the beginning of this article.

Below follow some further illustrative exemplars applied to different user contexts, but with finer details not normally noted in the information behaviour literature as discussed in an earlier section. The first language of a person is often also referred to as their native language or mother tongue. In the following examples, first language is abbreviated as L1; L2 refers to any undefined second or foreign language the user encounters in a text.

- A reader who is reading a text for leisure in their first language, English:

Reader
[+leisure]
[+first language]
[+L1/English]

- A reader who is reading an academic article for their work on astronomy, a topic in which they are an expert, in a foreign language (L2) of which they have a satisfactory reading knowledge:

Reader
[+work]
[+academic]
[discipline-specific]
[+astronomy]
[+expert-level article]
[+L2]
[+reading knowledge]

- A reader (a lay person in the specific discipline) is reading an expert-level non-fiction article in their first language, English:

Reader
[+leisure]
[+non-fiction]
[+lay person]
[+astronomy]
[+L1]

The context of an information source

An information source also has a context of itself, as illustrated in the following examples:

- A novel in English, set in the 17th century in the USA

[+leisure]
[+English]
[+USA]
[+17th century]

- An academic article aimed at an expert in the second language of the reader

[+academic]
[+expert]
[+L2]

- An academic article aimed at an expert in the first language of the reader

[+academic]
[+expert]
[+L1]

The context of an information intermediary

- Dictionary

[+monolingual]
[+L1/first language]
[+metadata to interpret style, register, region, etc.]

- Dictionary

[+bilingual]
[L2]
[+advanced]

- Encyclopaedia

[+introductory]

Interaction between reader and information source

In all the cases mentioned, the reader has an information need, namely to understand a text (the information source) fully. When they come across a word they do not understand, this triggers a secondary information need, namely to understand the specific word in its context. The reader can obviously decide to ignore this secondary information need, or decide to ask a human intermediary, who could (or possibly could not) solve this information need. In both these latter two cases, a document-based information intermediary is not relevant.

A successful interaction of the reader with the information source is possible when the context and attributes of the text being read map completely with the attributes of the reader, e.g. when a subject expert reads an expert-level article in their discipline in a language in which they have sufficient proficiency.

However, when there is no such perfect (or semi-perfect) matching between the context or attributes of the reader and the information source, an intermediary is required and successful interaction will only be possible when the context of all three variables, namely reader, information source and information intermediary, overlap to a very large extent:

- The reader, reading a novel set in the USA in the 17th century, will only be able to solve their information need if the dictionary contains the required metadata to determine that the word is archaic and occurs in American English.
- The reader, reading an expert-level academic article in their second language, will only be able to understand the word if they consult an advanced L2/L1 bilingual dictionary that would contain the relevant technical terms.
- A lay person, reading a fairly complicated expert-level text, may not be able to obtain the necessary help to solve their information need from a dictionary, but may have to consult a different information source, such as an encyclopaedia, that could provide a simplified overview of the topic at hand.

In summary, this process can be described as follows:

- A person would like to know more about a topic, i.e. identifies a primary information need, namely, to know more about the topic.
- In the text, a word occurs which they do not understand.
- This triggers a secondary information need to enable them to understand the text fully.
- This secondary information need can be solved by accessing a dictionary (or other information source) that could provide the necessary information relevant to the information need.
- The secondary information need is solved, and the reader can continue to read the text to solve their initial information need.

This could, however, be an iterative process if the first source consulted does not contain the required information, e.g. the specific word does not occur in the dictionary, or the required disambiguation cannot be deduced from the dictionary, or the dictionary does not provide the necessary metadata to differentiate between different usages, or the dictionary is not the appropriate source to solve the specific information need.

This process can be visualised as in Figure 2:

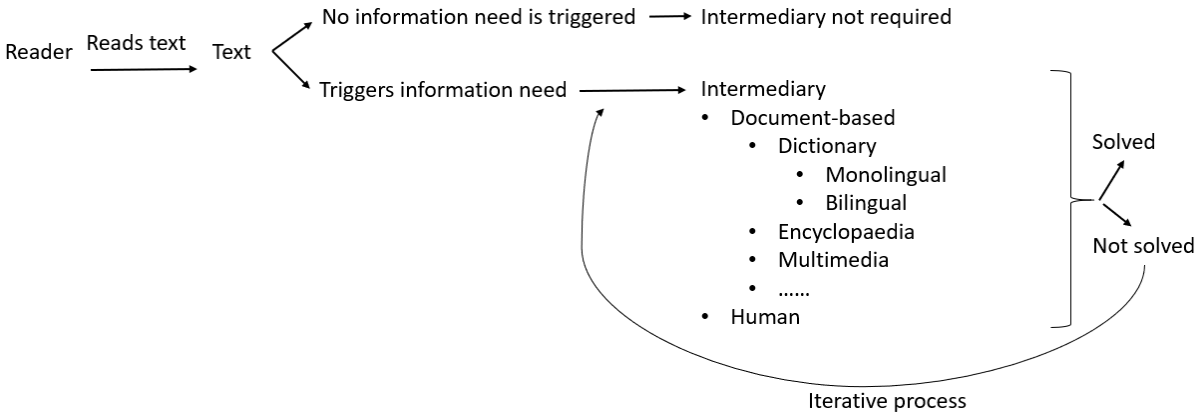

Figure 2. Visualisation of the interaction process between user/ information seeker/ reader, information source and information intermediary

The necessity of matching the specific attributes based on the specific context of an information user/ reader, information source and information intermediary can be further illustrated with the examples in Table 1; only one attribute is given in each case. One user/ reader can have different attributes depending on the specific context. For example, an expert in one discipline could be only a semi-expert in another discipline: in their own discipline, no intermediary would be required to understand a text fully; however, secondary information sources may be required to understand a text in another discipline. The same expert can be reading for leisure, at which stage their attribute as *expert* is not relevant for any secondary information need which could be triggered by reading a text set in the Middle Ages, or in a language which is not their first language. See Bergenholtz and Bothma (2011) for further details and examples. The user/ reader can find themselves in any of the contexts noted earlier, e.g., geographic, activity, workplace, occupation.

User/reader	**Information source**	**Secondary information need**	**Information intermediary**	**Success**
User [+discipline expert]	Text [+discipline-specific]	None	No intermediary	Y
User [+discipline expert]	Text [+other discipline]	Needs to understand basics of other discipline	Secondary information sources, e.g. [+introductory article] [+encyclopaedia] [+subject-specific dictionary]	Y
User [+semi-specialist]	Text [+specialist]	Understand unknown terminology	Dictionary [+discipline specific]	Y
User [+lay person]	Text [+foreign language]	Lack of foreign language skills	Software [+automated translation]	Y
User [+lay person]	Text [+historical]	Understand historical meaning of words	Dictionary [+learner's dictionary]	N
User [+leisure] [+L2 limited]	Text (+contemporary novel] [+L2]	Understand uncommon words	Dictionary [+bilingual] [L2/L1]	Y

Table 1. Matching attributes of users or readers, information sources and information intermediaries for secondary information needs

It needs to be stressed that the preceding examples of contextual attributes are exemplars of possible contextual attributes and are not exhaustive. More complex scenarios, considering more contextual variables in the case of both a reader and the text being read (the information source) will influence the required contextual variables of the information intermediary (the dictionary or other information intermediary).

Conclusion

Context within information behaviour has been studied in depth, and research in this field is still

expanding to provide a more detailed and nuanced interpretation of the concept, as is evident from the publications cited in the earlier sections of this paper. The list of publications is obviously not exhaustive, but provides a good overview of the variety of interpretations and the complexities that are associated with the concept. It is, however, clear that, in all interpretations, the immediate and extended environment of the information user, as well as the characteristics of the user, are of importance.

In this study, one specific type of information user is typified, namely the reader of a text and, in particular, electronic texts. However, this reader does not function in only one context – broader, personal and environmental attributes come into play, such as the expertise level of the reader, their language proficiency, the reasons why they are reading a specific text (e.g. to understand the treatment for a disease) and many more.

The text being read (the information source) also has its own context and attributes, e.g. it can be fiction that is intended for leisure reading, an expert-level academic text on a specific topic within a discipline that the reader intends to study to expand their knowledge on a subject or an elementary text that introduces the reader to a specific topic.

One aspect of this context of reader and text is nevertheless constant, namely that the reader expects to understand the text fully (their primary information need). If this is the case, the information need is solved and the reader has satisfied their information need. However, while reading the text, a secondary information need could be triggered, namely to understand the meaning of a specific word in the text. Furthermore, they would like to solve this information need by consulting an information intermediary, be this a human or a document-based source. (They can, as mentioned, obviously also decide to ignore this secondary information need, and simply carry on reading.) A human being, as intermediary, is not discussed in this paper, and the complexities of human intermediation are not addressed.

Using a document-based intermediary is only successful if the intermediary provides access to the required information. If a specific word does not occur in the dictionary or other information intermediary that is consulted, the intermediation fails, and an iterative process follows. The dictionary (or other intermediary) should be *fit for purpose*, i.e. it should contain information at the level of complexity and detail that the reader requires, or it should be in the language that the reader requires. A learner's dictionary, for example, is not sufficient if a reader needs to understand very complex technical terms; and an explanatory dictionary in a foreign language will not be of use if the reader is not fluent in the foreign language and needs a bilingual dictionary. *Fit for purpose* therefore implies that the contextual attributes of the dictionary (or other intermediary) match the contextual attributes of both the reader and information source sufficiently so that the secondary information need can actually be solved. Context in information behaviour research can be enriched by adding the context of the information source (the text) and the context of the information intermediary (the dictionary or other intermediary) to the research agenda, and discussing these issues as well, if appropriate in the broader context of the specific information need.

In this paper, we demonstrated how interpretations of information behaviour contexts that focus on user contexts can be enhanced by considering additional contexts. Our knowledge of such contexts come from work on e-dictionaries and lexicographic insight in the use of e-dictionaries. Studies on information seeking behaviour in a variety of contexts, such as patients seeking disease-related information, might be enriched by considering what happens when they use (or are encouraged to use) dictionaries and other document-based intermediaries, and focus closer on the contexts of words and sources. We might refer to this as granular-level contexts. Such contexts might clarify some challenges patients experience. Adding our insights to information literacy training might also open up new research opportunities.

About the authors

Dr **Theo JD Bothma** is Professor Emeritus and contract professor in the Department of Information Science at the University of Pretoria, South Africa. He is the former Head of Department and Chairperson of the School of Information Technology (until his retirement at the end of June 2016). His current research focuses primarily on aspects of information literacy, e-lexicography and digital humanities. theo.bothma@up.ac.za

Dr **Ina Fourie** is a Full Professor and experienced information behaviour researcher, Chair-Elect of the iSchool Board, EXARRO Chair in Extended Reality (XR) (University of Pretoria) and former Head of the Department of Information Science and Chair of the School of Information Technology, University of Pretoria. She served on the Information Seeking in Context (ISIC) Steering Committee (2016–2023) as Secretary and Vice-Chair. Her core research interest is health information behaviour and palliative care. ina.fourie@up.ac.za

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