LITERATURE REVIEWS AND THE HERMENEUTIC CIRCLE

Sebastian K. Boell and Dubravka Cecez-Kecmanovic

Conducting a literature review is a vital part of any research. Library and information science (LIS) professionals often play a central role in supporting academics in their efforts to locate relevant publications and in teaching novice researchers skills associated with literature reviews. This paper examines literature review processes with the aim to contribute to better understanding of their complexity and uncertainty and to propose a new approach to literature reviews that is capable of dealing with such complexity and uncertainty.

Sebastian K. Boell; Dubravka Cecez-Kecmanovic
Information Systems Technology and Management, University of New South Wales, Sydney, NSW 2052, Australia. Email: s.boell@unsw.edu.au; dubravka@unsw.edu.au

INTRODUCTION

Literature reviews are a vital part of any research project. Librarians often play an important role in supporting academics in their search for literature and in training neophyte researchers in literature research techniques. The service librarians provide in this context extends beyond searching and includes for example advising on, and providing access to, appropriate literature. At times it can be difficult to provide young researchers with a proper understanding of the whole literature review process.

Librarians and information professionals teach and themselves use a wide range of skills for identifying and locating literature. They draw on different techniques during searching including search operators and field search. They rely on search strategies for making their attempts more focused and for identifying additional literature. They assist in obtaining relevant literature in print, electronically and through other libraries. Furthermore, they rely on and train others in using supportive tools for managing references, for instance, using software like *Endnote* or *Refworks*. Moreover, they are proficient in using and educate others to use professional literature research databases like *Scopus*, *Web of Science*, or *ScienceDirect*.

Literature reviews are of importance to academics in all fields (Bensman, 2007) with librarians often assisting academics in locating literature for their reviews and their research (McKibbon, 2006). In most cases literature reviews are an integral part of research publications, but they can also comprise a research publication on their own right (Garfield, 1987). Over the last decade an increasing number of authors have started to use structured approaches for compiling literature reviews known as *systematic reviews* (Chalmers & Altman, 1995). Such an approach was first used in medicine (since the mid 1990s) but is now spreading to other disciplines as well. Authors of systematic reviews claim that selecting the literature for a review in a structured way leads to unbiased, complete and reproducible reviews (Kitchenham & Charters, 2007).

This article questions the claims that any selection of the literature can be 'unbiased, complete and reproducible' and argues that in most cases a review of relevant literature cannot be achieved following a structured approach. As an alternative it introduces a hermeneutic approach towards literature reviews. Seeing literature review as a hermeneutic process makes it evident that there is no final understanding of *the* relevant literature, but a constant re-interpretation leading (ideally) to deeper and more comprehensive understanding of relevant publications. It argues that especially in the social science and humanities literature, reviews are better understood as a continuing open-ended process where increased understanding of the research area and better understanding of the research problem inform each other. Although the hermeneutic approach is more obvious in the social sciences and humanities it is not limited to these fields.

The main purpose of this paper is to identify deficiencies of the systematic review and propose the hermeneutic circle framework to overcome them. The hermeneutic framework is of interest to researchers as well as those who teach and assist others in their quest for literature. In order to exemplify the practical relevance of the framework it will briefly discuss some practical literature research methods. However, it does not provide an extensive introduction into such techniques, only aiming to provide an overview of different techniques that can be further extended by researchers and those training novice researchers.

This paper aims to a) contribute to better understanding of the literature review process by drawing from hermeneutics, and b) proposes a model of the literature review as a hermeneutic circle including potential strategies and techniques for searching, filtering and refining, that advance the quality of literature reviews.

SHORTCOMINGS OF STRUCTURED APPROACHES USING DATABASES

One approach to undertaking a survey of existing literature is known as systematic review. The phrase

was first used in medicine in the mid 1990s (Chalmers & Altman, 1995) from where it spread into other fields. For example, through the fields of medical informatics (Shiffman et al., 1999) and health technology (Ramsay et al., 2000) the phrase made its way into the software engineering literature (Kitchenham, 2004).

In contrast to other types of literature reviews, systematic reviews follow a structured approach. First a body of potentially relevant publications is identified. Each publication is then evaluated according to clearly defined criteria for inclusion or exclusion set beforehand. Such a process is therefore potentially reproducible by other researchers (Greenhalgh, 1997; Kitchenham & Charters, 2007). In medicine the rationale behind systematic reviews was that spotty coverage of publications can lead either to unnecessary studies on treatments otherwise shown to be non-promising, or even more severe, to prolonging studies on treatments which could be life saving (Mulrow, 1995). The aim of systematic reviews is therefore to apply more rigorous methods when looking for literature to avoid such problems (Oxman, 1995). However, in order to follow this structured approach the research question being investigated has to be fixed before the literature review starts. Therefore, systematic reviews may inhibit academics from pursuing further literature if it does not match the initially set question. As MacLure (2005) puts it: "diversions into unanticipated areas are not encouraged ... learning from adjacent areas is not recommended either." This is especially problematic in social sciences research and the humanities, where research questions typically are less definitive and may evolve over the course of the research.

Anyone who has undertaken research in these areas knows that a deeper understanding of the research problem is gained as the literature review progresses with the researcher becoming more aware of what questions are most relevant or pressing. Systematic review strategies are therefore ill equipped to address research that cannot be precisely formulated in a form of closed questions before starting the review process. Claims by proponents of systematic reviews that this method is suitable for research students undertaking a PhD (Kitchenham, 2004) is therefore open to question.

Apart from narrowing the questions which can be pursued by academics in literature reviews, guidelines for undertaking systematic reviews in the social sciences disciplines often understand systematic reviews as reproducible database searches (Kitchenham, 2004; Kitchenham & Charters, 2007). It is therefore important to highlight further issues with systematic reviews arising from technical shortcomings related to database searches. Concentrating on database searches for literature reviews is insufficient for two reasons. Firstly, databases are limited in their coverage. Secondly, search terms are generally indeterminate.

Limited coverage stems mainly from the fact that single databases only cover a subset of all academic

journals. Each database will therefore exclude some journals with potentially relevant publications. Furthermore, not all journals covered by a database are indexed from cover to cover, omitting many publications considered as not fitting the scope of a particular database. For this reason, even if two databases index the same journal the coverage of articles might differ. On top of limited coverage of journal articles by databases, coverage of books and book chapters in databases looks even worse. One example of a study investigating the scatter of relevant literature over databases was undertaken by Hood and Wilson (2001). Their findings show that for most topics, searching even more than 30 databases could still help to identify additional relevant records.

The second factor, indeterminacy of search, refers to the fact that a specific topic can be described using different words. The same topic can therefore be represented using an almost indefinite number of expressions. Inevitably even an elaborate search strategy using various synonyms for the same word cannot capture all relevant expressions. Systematic approaches using a pre-defined set of keywords (cf. Kitchenham & Charters, 2007) may miss relevant publications that could be found by using different wording.

Combining possible synonyms can lead to searches retrieving an impressive numbers of results. However, the results are usually of low precision, with only a fraction of all retrieved 'results' being relevant. They are therefore by no means necessarily superior to searches retrieving a low number of results. Moreover, retrieving huge result sets lead to the laborious task of having to evaluate a large number of results. Even when following strict guidelines during selection, the bigger the results set the greater the chance for error (Blair, 2006). For example, Beecham et al. (2006) report that 92% of the 1,445 records retrieved by their search on “motivation in software engineering” could be rejected without even looking at the paper.

Systematic reviews as advocated outside medicine fall short of their own claim of overcoming bias as they often limit their search to particular journals or databases. In fact, this approach will inevitably introduce bias into literature reviews and was precisely the reason why systematic reviews were proposed in medicine in the first place. Furthermore, systematic reviews that closely associate literature reviews with repeatable database searches will inevitably miss any publication that does not use any of the keywords used for searching. Even worse, systematic reviews can only be correctly undertaken for closed research questions which cannot be altered in the light of the deeper understanding gained through the literature review.

THE HERMENEUTIC CIRCLE AS FRAMEWORK FOR LITERATURE RESEARCH

As the systematic approach to reviewing literature in the social sciences and humanities appears to have drawbacks, exploration of alternative approaches is warranted. One possible alternative framework is provided by hermeneutics.

Hermeneutics is concerned with the process of the creation of interpretive understanding (*Verstehen*). Understanding of a paper is never isolated. It is interpreted in the context of other papers from the literature. Understanding of the relevant literature in turn is impacted by each new paper read and interpreted. This process in a more generic form is examined by hermeneutics: how the understanding of parts relates to the understanding of a larger whole and vice versa. This movement back and forth between the parts and the whole in the process of understanding is described by the hermeneutic circle.

The whole body of relevant literature for a specific phenomenon consists of multiple texts and in turn individual texts can be seen as parts of the whole body of relevant literature. In accordance with the hermeneutic circle, understanding of the meaning and importance of individual texts depend on the understanding of the whole body of relevant literature which in turn is built up through the understanding of individual texts. Undertaking a survey of relevant literature can therefore be described by the hermeneutic circle.

The origin of hermeneutics can be traced back to the interpretation of religious texts (Ramberg & Gjesdal, 2009). Traditionally the interpretation of religious text was only the domain of the Catholic Church, however, with Martin Luther individual interpretations of religious texts became possible. This shift in interpretation opened up the room for the existence of multiple interpretations which in turn led to the question of how the 'right' or 'correct' meaning of a text can be derived. Early contributions towards modern hermeneutics started to see different factors involved when interpreting religious texts. For example, Benedict de Spinoza (1670|1895) acknowledged the importance of the historical horizon in which a text was written and Giambattisto Vico (1744|1979) stated the importance of the relationship between thinking and cultural context.

The 19th century saw the move of hermeneutics from religious texts to understanding in general and from approximating correct understanding to the approximation of better understanding. This move is mainly associated with Friedrich Schleiermacher and Wilhelm Dilthey. First Schleiermacher (1838| 1998) extended hermeneutics from religious and ancient texts to all forms of linguistic material and later Dilthey (1957) to understanding in general. Dilthey was therefore the first to see a general

relationship between hermeneutics and the question of human understanding, the problem further pursued by Heidegger.

Modern hermeneutics that deals with the question of human understanding in general is developed by Heidegger and Gadamer. Heidegger (2002) argued that self understanding and world understanding are inseparably interwoven. The question of leaving the hermeneutic circle when a clear meaning is reached is therefore affected by the way the hermeneutic circle is entered. A fact also important when undertaking literature reviews, as we will see below. For Gadamer (1960|1979) human being in general is closely related to language. Our understanding of prior works shape the understanding of ourselves.

Seeing the process of understanding as generally open ended and circular in nature, hermeneutics provides a framework for describing literature reviews. According to this understanding literature reviews facilitate a deeper understanding not only of the body of relevant literature but also a deeper understanding of individual texts. Literature reviews therefore do not have to start by identifying all potentially relevant texts, but through reading of relevant texts. Reading of texts will facilitate the quest for further relevant literature. Using this approach enables researchers to successively encircle relevant works. Depending on the nature of an investigation this encirclement can be wider, for broad overviews investigating general relationships, or narrower when a comprehensive survey of particular aspects is desired.

Reviewing literature is an iterative process that can be described by moving from the whole of all (identified) relevant literature to particular texts and from there back to the whole body of relevant literature. One important means for moving from the whole to its parts is searching. The primary means for moving from a part to the whole is through reading. It is important to note that as this process emerges and we circle between the part and the whole, the whole is changing together with the meanings of its parts.

For better understanding this process can be further broken down into more specific steps, depicted in Figure 1. Each of these different steps can then be associated with different techniques which can be used to facilitate further progress. Furthermore, shortcuts or feedback loops between different steps are possible. For example, reading might directly lead to the identification of additional literature, which is then acquired for reading.

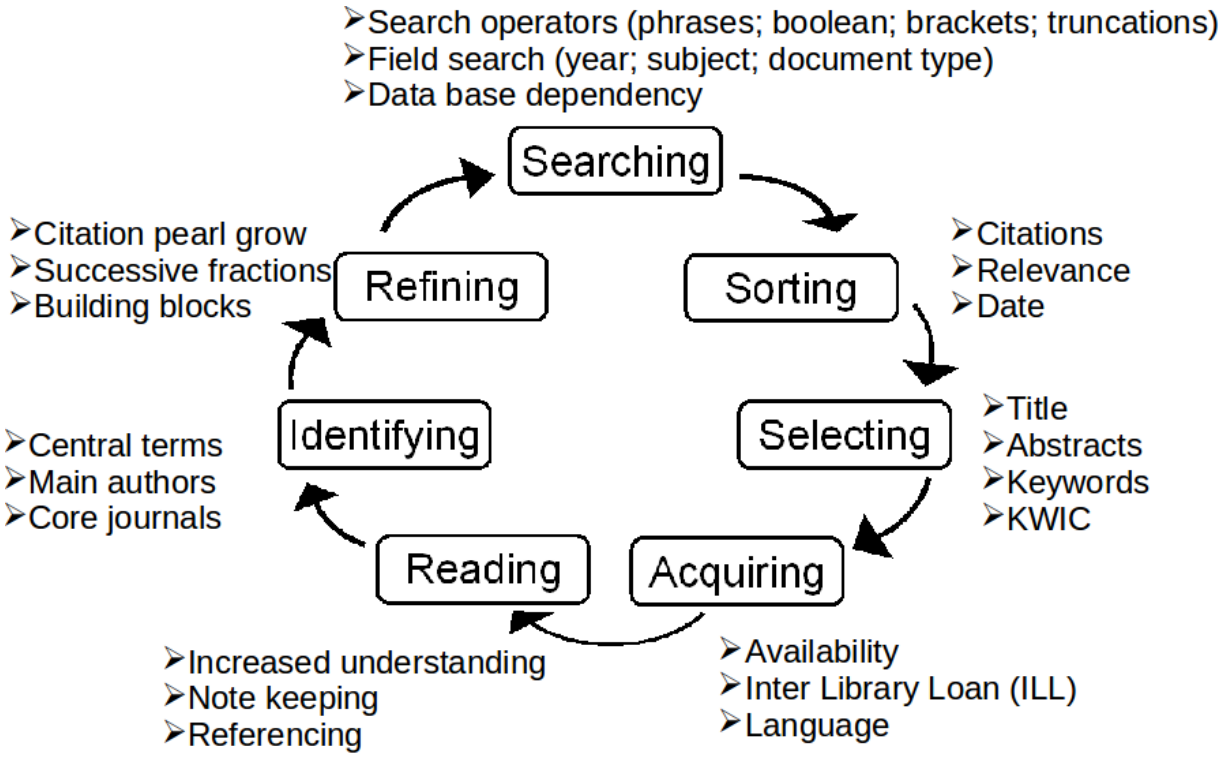

Figure 1: The hermeneutic circle of reviewing literature and techniques associated with different stages of the hermeneutic circle.

GOING THROUGH THE HERMENEUTIC CIRCLE

It is important to note that not every survey of existing literature has to start with a search. It is also possible that the first step is reading a document known to be relevant, for example, provided to a PhD candidate by their supervisor. Having already a relevant document at the start has some advantages as it, for example, introduces the use of vocabulary in a field.

Starting to look for literature

Heidegger has directed attention towards the entry point of the hermeneutic circle. In the context of reviewing literature this is reflected by the initial texts selected for reading. Academic literature consists of different document types fulfilling different purposes. When starting a survey of the existing literature some documents types hold more promise of being helpful than others. For example, reading a whole monograph on a theory before establishing if the theory is useful in the context of a research might be intellectually rewarding, but a not very efficient if it turns out that the theory is of limited use.

A good entry point into searching is provided by literature giving an overview of the area of interest and adjunct areas. Apart from book chapters aiming to provide an overview, entries in encyclopedias and review articles are of particular interest. Relevant book chapters are harder to identify but they

might be identified using the other two types of literature.

Starting the review by looking up relevant entries in subject specific encyclopedias usually leads quickly to the identification of further literature. Subject specific encyclopedias have some advantages over general encyclopedias which might also be helpful during the initial stage. They are written by known experts in the field and the authorship of articles is usually indicated, giving them authority when cited. Moreover, they usually provide references to further literature and are therefore a good way for identifying introductory literature. Disadvantages of subject specific encyclopedias are that they are not always available in electronic form. Furthermore, as they are labor intensive to prepare with a limited readership they are usually costly and therefore not every library can afford all encyclopedias their patrons might find useful. For the same reason they are usually not updated frequently, missing references to current literature and recent developments. Electronic access over the Web may help to overcome these limitations. The *Stanford encyclopedia of philosophy* (Zalta, 2009) is a noteworthy positive example of this approach.

Arguably the most important document type when starting to look for literature are review articles. In addition to the merits of review articles already mentioned in the introduction, Blair notes that overview articles provide access to the intellectual concepts of an area and the structure of those concepts (Blair, 2006). Moreover, they introduce the specific vocabulary used to discuss those concepts. Reviews usually draw on a wide range of material introducing important research publications and their relationship to each other. Reviews are therefore ideal for immersing into a field. Reading review articles at the beginning of research is helpful, even if only some sections of a review are relevant for a particular research project. Initial literature searches should therefore aim to identify recent relevant review articles if possible. For example, *Scopus* and *Web of Science* both allow to search specifically for review articles (Figure 2 and 3).

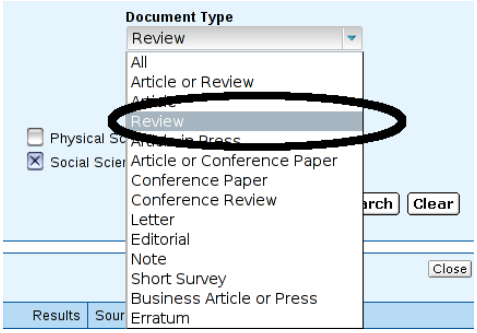

Figure 2: Searching for review articles in Scopus.

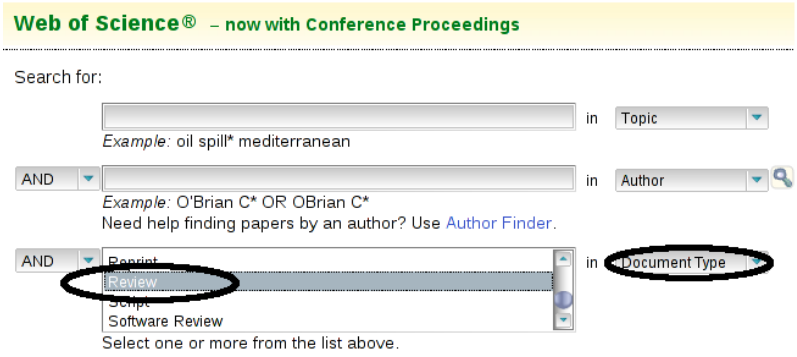

Figure 3: Searching for review articles in Web of Science.

Searching for literature

The processes of searching and selection are interwoven. Choosing particular search terms or search fields will affect the literature retrieved. Wider searches will retrieve more documents making a more laborious selection necessary while narrow searches may omit relevant documents. Retrieving a small set of highly relevant documents during the first iteration of the hermeneutic cycle is preferable over huge sets of document whose relevance cannot be sufficiently judged. Returning to the search after the first set of documents is read will then allow searching for additional documents based on extended understanding of the topic. This not only helps to search for relevant literature more effectively, but also helps to better avoid irrelevant literature as well.

Different methods and strategies can be used to achieve this goal. One strategy that can help to limit the number of retrieved documents is field search. Most likely to be useful in this regard are fields for '*publication year*', '*subject category*' and '*document type*'. The advantage of focusing on certain document types was already discussed above in regards to review articles. Using search operators is another well known way for achieving better precision when searching, providing retrieval systems additional instructions on what to do with search terms. They can be used to make search terms more or less restrictive and to combine search terms in different ways. Operators include the use of phrases, truncations, the boolean operators AND, OR and NOT as well as proximity operators like NEAR.

Sorting search results

One example of sorting documents in order to identifying central literature is to employ citations. Using citations as ranking criteria allows identifying central publications that have been used extensively by other academics. Two databases mainly associated with this search feature are *Web of Science* and *Scopus*. It is important to keep in mind that citations favor older publications as they simply have more time for being cited. Citations are therefore useful for identifying central older publications. When searching for latest research publications citations are of limited use.

Selecting search results

After a search has been undertaken retrieved results are analysed for their relevance. Analysis usually involves looking at the title and abstracts of documents in order to establish if they are relevant in the context of the search. Documents judged to be of potential relevance are then acquired for reading. However, titles and even abstracts of articles may not convey the content of an article sufficiently (Hartley & Betts, 2009). Full copies should therefore be obtained for all potentially relevant articles.

In some cases the analysis of search results may lead directly to refined searches, for example when the retrieved results are not matching the desired documents. This also happens when using a search strategy when the process of analysis is interwoven with the search process. Retrieved documents are analyzed for their relevance in order to adjust the search strategy. In this case *analysis*, *refining* and *searching* are repeated until the selection of retrieved documents reaches an acceptable level of precision and completeness.

Acquiring relevant documents

Documents judged as being of potential relevance have to be acquired for reading. In some cases this can be difficult. If authors concentrate only on publications that are easy to obtain for them important findings may be missed. Recent journal articles are usually available in electronic form and can be accessed directly from the desk or from home if a library has paid for access rights. Older literature may require a trip to the library in order to obtain a copy. Furthermore, some literature might not be available at an institution's library. If a copy cannot be requested through inter library loan (ILL) a physical trip to another research library might be necessary. These might seem like extreme cases, but some types of literature of relevance to academics are difficult to obtain. For example, conference contributions are usually more difficult to obtain than journal articles. Libraries simply cannot hold the proceedings of all major international conferences. Moreover, proceedings from important national societies might only be available in libraries overseas. Another example of literature that might be difficult to access are foreign language publications. If one cannot read the language in which they are written one might miss relevant publications.

In the case of a hermeneutic approach focusing on accessible literature first is acceptable. After reading the first set of relevant papers the importance of publications not yet obtained can be better judged. For example, if several other papers cite a particular publication that subsequently appears highly relevant it should be included in the literature review. Limited access is not an acceptable excuse for excluding a publication believed to be of importance.

One strategy for obtaining copies of publications not readily available is to contact authors directly.

Generally authors are happy to send a copy of their publication via email if they have an electronic version of their publication available. Also, as more and more journals allow authors to self-archive their publications on their homepage or in open access repositories authors have started to make copies of their publications available via the Web.

Reading of identified publications

Arguably the most important part of a survey of existing literature is reading. Through reading important concepts are identified while at the same time the vocabulary used to describe those concepts is mastered. Furthermore, through reading one can learn how similar results are interpreted differently by different authors. Increased understanding of a topic acquired though reading can be used to identify additional search terms and phrases as well as related theories.

Other important aspects of the reading process are note keeping and referencing. In order to provide an overview of an extensive body of literature it is important to establish means for keeping track of the read literature. This includes keeping notes on who said what and who was referring or criticising particular research by others. There are various means for achieving efficient note taking, for example, one can create comparison tables, use mind mapping techniques or use software supporting qualitative analysis like *Nvivo*.

Regarding referencing, software tools can be used to ensure that read literature is later cited correctly. Especially for novice researchers citing material correctly can be a difficult process. There are several different types of academic literature including, for example, journal articles, conference publications, book chapters, reports and books, all of which has to be cited differently. In addition there are hundreds of different citation styles following different standards when citing literature. For instance, referencing tools like *Endnote* or *Refworks* can assist in citing different types of literature in different styles correctly, while also keeping track of which works have been used in a particular text. Therefore, they not only help to ensure that all used literature is cited, but also that that it is cited according to the required citation style.

Identification of further literature and search terms

Reference tracking can be used to identify further relevant literature while reading. This is also sometimes called snowballing. As authors base their research on earlier research they are always referring to other literature relevant to their own research. Therefore, texts provide a synopsis of other texts they are referring to. Subsequently, reading one publication can help to identify further literature in the same area that is not yet known. Paying attention to the literature referenced by others can be a powerful way for identifying additional literature. For example, Greenhalgh and Peacock (2005)

report that for their review, reference tracking was the most effective as well as the most efficient way for identifying literature.

While reference tracking is a good way for finding additional literature it has one major disadvantage. It can only go back in time. The literature found through reference tracking is usually published before the paper the references are taken from. One way for avoiding this disadvantage is to use citation analysis in *Web of Science*, *Scopus* or *Google Scholar*. If an important paper is identified these databases can be used to find other papers citing that paper. This way citing literature can be tracked forward in time.

One can also try to identify important outlets for particular research. Bradford (1934) noted already in 1934 that the literature on a specific topic is not spread uniformly over academic journals. Some journals publish more articles of relevance to a specific topic than others. A substantial part of the literature will appear in only a handful of 'core journals'. This effect is also known as Bradford's law of scattering. This scatter of relevant publications can be employed when searching for literature. Through reading and citation tracking the 'core journals' for specific topics can be identified and a future search can focus on those journals. For example, field search can be used to search in those journals only while using less restrictive search terms. It is however, important to keep in mind that the flip side of Bradford's law of scattering is that the entire body of relevant literature will always extend over a vast amount of journals. A thorough literature review should, therefore, never focus on a specific set of journals only.

Apart from identifying core journals one can also try to identify important conferences. Literature research can then focus on the proceedings of those conferences. Visiting an upcoming conference may also be a good way for becoming familiar with current research in the field.

A similar relationship that exists between relevant publications and journals also exists for researchers. Scholars are not equally productive (Lotka, 1926). Therefore, it is possible to identify some highly productive authors. Browsing the publications from specific authors believed to be central to a field is therefore another way for finding additional relevant publications. In addition to going through the publication lists of an individual author, one can also look for publications citing central authors. *Web of Science* or *Scopus* both allow doing this.

Refining searches

Some methods for refining searches have already been mentioned: looking for publications in 'core journals'; looking for publications by 'central authors'; and looking for publications citing other relevant publications. It was also mentioned that by reading relevant literature additional search terms

and expression will be identified that can be used in subsequent searches.

As discussed above using field searches and search operators allows the construction of complex queries that can be very powerful when looking for literature. However, the down side of complex queries is that they can sometime lead to unpredictable results. Documents one believed will be retrieved are missed while documents one wanted to exclude are among the results. Search strategies can help to avoid the pitfalls of complex searches by refining searches. Search strategies make use of the *search history* function available in document retrieval systems. Two main approaches can be distinguished, *building blocks* and *successive fractions*. Using *successive fractions* one tries to start with a query designed to retrieve as many relevant documents as possible and then successively 'slice off' groups of irrelevant documents from the results. The goal is to come to a point where the result list reaches a satisfactory level of precision. This approach is sometimes also called 'funnel search'.

The *building blocks* strategy starts with a set of simple searches that are then combined to build up a complex search. The advantage of this method is that it allows identification of search terms that retrieve unwanted documents during the search process. It is, especially helpful when good search terms are not known. Looking at the results for each term one can evaluate if an additional search term helped to identify additional documents. Unpromising search terms can be dropped in order to achieve better precision.

In addition to those methods one can apply a *citation pearl growing* strategy. A citation pearl growing strategy uses relevant articles as a starting point for further searching. These central articles are used for identifying characteristics of relevant publications. Using these characteristics for searching one tries to successively extend the number of relevant articles. One way of doing a citation pearl growing strategy is by using citations. This method was already introduced above. In addition to citations one can try to make use of keywords assigned to documents. By looking at the keywords assigned to relevant documents one can try to find other documents indexed with the same keywords.

In addition one should try to get familiar with the way different databases operate. Most databases try to support users in their search. For example, *Scopus* provides various categories derived from retrieved documents. These categories are displayed at the top of each results list. Figure 4 provides one example on how this list can be used for excluding groups of documents that are not desired. In this example the 'refine results' function can help users in applying a successive fractions strategy.

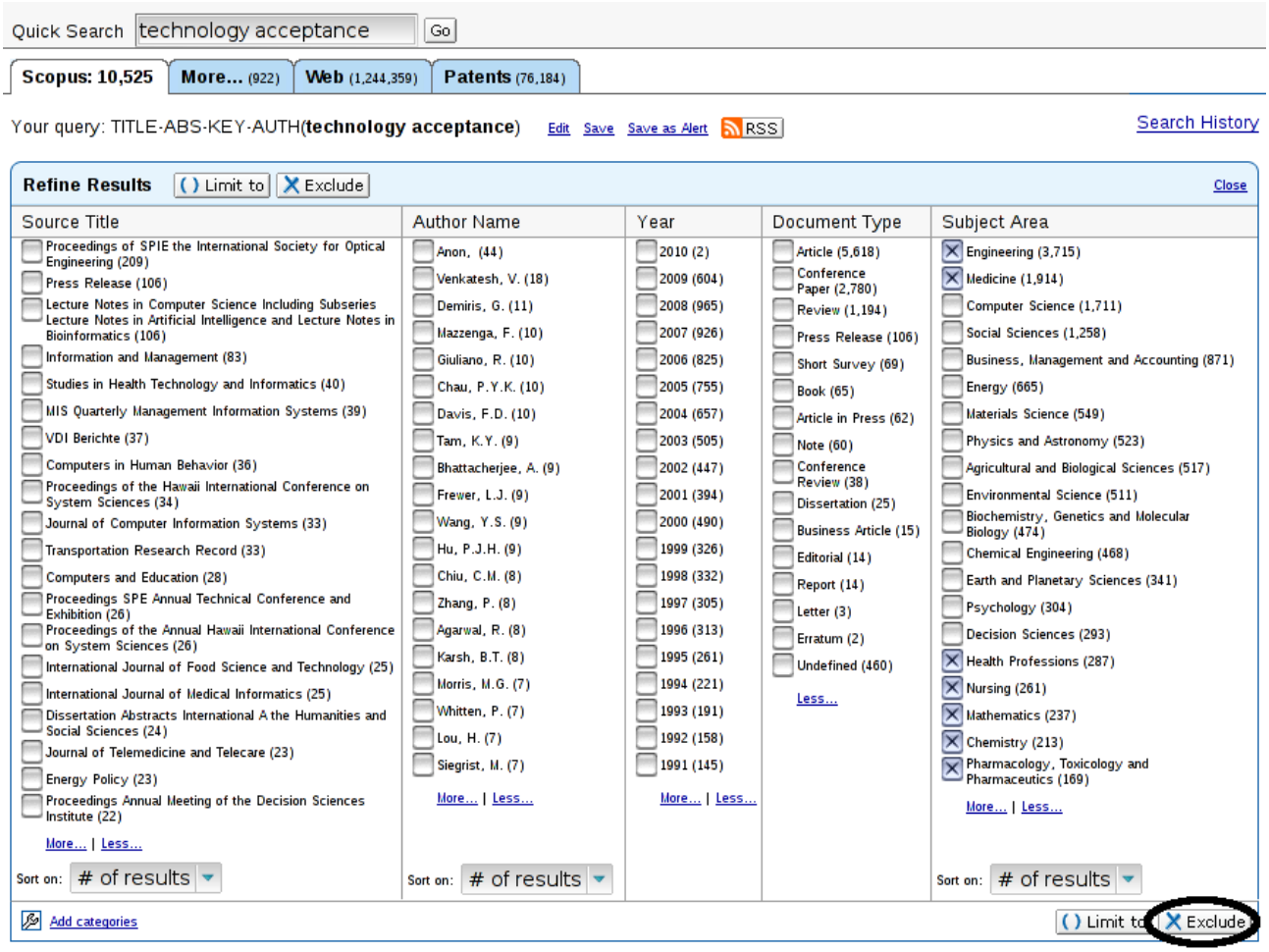

Figure 4: Refining search results in Scopus.

Leaving the hermeneutic circle

This leaves us with the final question of when to end a search and leave the hermeneutic circle? Using a hermeneutic approach to literature reviews, relevant literature is not detected in bulk but is approximated through encirclement. This ensures a continuous identification of relevant literature. Moreover, it allows the adoption of new areas and related research fields as one comes across them. A hermeneutic approach also allows adjustment to the magnitude and time constraints of particular research projects. Additional time allows additional iterations and therefore a better approximation towards more relevant literature. Additional iterations will retrieve more relevant literature, identify new adjacent areas and related theories. In fact many researchers will continue to pursue literature of relevance to their area of interest without ever reaching a final point. Such dedication may eventually lead to publications of major importance but in the context of a specific research project, more pragmatic criteria might be desired. In this case a point of saturation may be reached if additional publications make only a marginal contribution to further understanding of a phenomenon. This is the case, for instance, when key ideas and results have already been read or when a substantial part of the

references cited by a publication are known. This indicates that the main publications have been identified and read and a point of saturation has been reached.

CONCLUSION

As systematic reviews can only be correctly undertaken when research questions can be set before the literature review is underway it has been argued that they are not suitable for most literature reviews in the humanities and social sciences, where most prevailing research questions generally only start to emerge when the literature review is well under way. Furthermore, in these disciplines research questions are generally fairly open, not allowing that clear boundaries of the relevant literature can be established. But systematic reviews are also often not feasible for literature reviews in the natural sciences when resources and time is limited. If systematic reviews are undertaken in the way they were initially advocated they should aim to identify *all* relevant literature regarding a particular research question without regard for origin, language or by relying solely on database searches (Chalmers & Altman, 1995). Clearly for most researchers this is an impossible task. Guidelines for systematic literature reviews outside medicine put systematic reviews on a level with repeatable database searches. For this reason limited coverage and indeterminacy of search terms have been discussed as two main shortcomings of database searches.

To address some shortcomings of systematic reviews this paper proposes the hermeneutic approach as an alternative framework to conducting literature reviews. By using the hermeneutic circle for describing the process of literature research the paper provides a framework that can be used by information professionals who assist and teach others in searching literature. It brings together different aspects of the literature review process under one umbrella thus facilitating integrative understanding of different sets of skills used for identifying and obtaining literature of relevance in a particular context. In this framework the stages of searching, sorting, selecting and acquiring as well as reading, identifying and refining are connected. While each stage is associated with different skills all stages inform each other in order to facilitate the literature review process. While searching helps to pin-point literature for reading, reading in turn can inform the search process as well.

The practical use of the framework has been shown by providing examples of different techniques, methods and strategies frequently taught and used by LIS professionals. Such techniques include search operators as well as employing citations for identifying central publications. They also include services provided by librarians like inter-library loan, or search strategies like building blocks, successive fractions and citation pearl grow. It includes tools used by LIS professionals in their work environment and by their clients. For example, literature reference databases like *Web of Science* and *Scopus* or referencing tools such as *Endnote* or *Refworks*.

According to a hermeneutic framework using more targeted searches can help to identify documents considered to be highly relevant in the light of the current understanding. Reading these publications will then provide the foundation for finding additional literature and better approximating literature considered to be relevant. The aim of an initial literature search following the hermeneutic approach is therefore not to retrieve a huge number of potentially relevant publications but to identify a small number of highly relevant publications instead. Repeating these steps in subsequent iterations of the hermeneutic circle will help academics in approximating a better understanding of the literature of relevance to a particular phenomenon. Using the hermeneutic circle as a model for literature reviews can therefore help academics in advancing the quality of their literature reviews. It might also be useful for facilitating a general understanding of the literature review process by undergraduates (Wilkes & Gurney, 2009).

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