Henning Bergenholtz & Rufus Gouws**

A New Perspective on the Access Process

Abstract

Only 10 or 15 years ago, you had to spend hours, days or even weeks in libraries to find data of many kinds. Today, one has access to data at your desks at home. Therefore, the biggest problem for a real information society is not that you do not have access to the needed data, but that you cannot find it or that it takes so long to find it that you quit the search before finding the result. This is clearly shown by a Google search where you get so many results that can lead to a case of information stress or even worse information death. An easy search route and a short search time are important elements when trying to satisfy certain information needs. This topic is discussed based on two case studies: one concerning certain fixed expressions in seven Danish printed and electronic dictionaries and one concerning looking at different access attempts in six Afrikaans reference sources, including linguistic text books, books presenting the formal spelling and orthographic rules of Afrikaans as well as a monolingual dictionary. The paper argues that the applicability of the access process, as developed in lexicography, goes beyond dictionaries, illustrating the importance of a process not relevant within the field of linguistics but extremely important in the successful use of reference works.

1. Introduction

Lexicography has been regarded by many people as a subdiscipline of linguistics or a form of applied linguistics. This is not due to the nature of lexicography but to the way in which linguists and lexicographers have approached lexicography. They had put lexicography within the scope of linguistics and wilfully maintained that status. A brief historical look at the development of theoretical lexicography ascertains this idea.

The early phases in the western world in the development of what is today known as theoretical lexicography/dictionary research/metalexicography give evidence of the direct link between lexicography and linguistics. Research in this field was mostly done by linguists and within departments of linguistics and the main focus in many of these research projects had been on the linguistic contents of dictionaries, cf. Zgusta (1971), Al-Kasimi (1977), Householder/Saporta (1967). A subsequent phase in the development of theoretical lexicography saw the first indications of an approach to elevate lexicography from a subdiscipline of linguistics to an independent discipline in its own right, cf. Wiegand (1984). The focus of dictionary research was not restricted to a study of the linguistic contents of dictionaries but dictionaries were also studied as containers of data, by putting the research emphasis on a variety of dictionary structures, cf. Hausmann andWiegand (1989). A next phase, re-iterating the independent status of lexicography, re-introduced the notion of lexicographic functions. This approach worked with dictionaries as utility tools, compiled to respond to the specific needs of specific users with specific reference skills in specific situations of dictionary use, cf. Tarp (2000), Bergenholtz/Tarp (2003).

Of critical importance in a user-driven lexicographic approach is the need to ensure that the target users of a specific dictionary gain unimpeded access to the data they need in order to achieve an optimal retrieval of information. This has led to a number of research publications in which the notion of the *access structures* of dictionaries has been developed, cf. Wiegand (2007), Hausmann/Wiegand (1989). The notion of *access* is extremely important in lexicography, although

* *Henning Bergenholtz*
Centre for Lexicography
Aarhus School of Business,
Aarhus University
Fuglesangs Allé 4
DK-8210 Aarhus V
hb@asb.dk

* *Rufus Gouws*
Department of Afrikaans and Dutch
University of Stellenbosch
Private Box X1
Matieland 7602
South Africa
rhg@sun.ac.za

questions can be raised regarding the notion of an *access structure.* Consequently in recent research the notion of an *access process* has been introduced, cf. Bergenholtz/Gouws (2008).

From a purely linguistic perspective it could be argued that the access process is of little or no interest. From a lexicographic perspective the importance of this notion and its application in the lexicographic practice may never be underestimated. These differences yet again emphasise the fact that lexicography is not a part of linguistics. Access is not only important in dictionaries but in all different types of reference works. Consequently Tarp (2008a) argues in favour of dealing with lexicography also in terms of the more comprehensive approach of data accessology. This approach is relevant not only to dictionaries but also to all different types of reference sources.

This paper will look at a number of issues regarding the access process, indicating that the emphasis in lexicography on the access process already gives evidence of convincing differences between lexicography and linguistics. Although the primary focus in this contribution will be on dictionaries it will be indicated that the access process that prevails in lexicography links this discipline to the wider discipline of a study of information sources. The occurrence of certain access procedures unique to dictionaries will also be discussed. Of importance for the independent status of lexicography is not the occurrence of access procedures or the subsequent link to disciplines other than linguistics. What distinguishes lexicography as an independent discipline is the fact that the access process becomes a focal area in metalexicographic research. This goes beyond the scope of linguistic research and ascertains one of the distinctive characteristics of lexicography as a discipline.

Presenting a new perspective on the access process this paper is based on the assumption that the user-perspective should be regarded with much more seriousness. Access should not be seen from the perspective of the lexicographer but empirical data and theoretical considerations should be employed to determine the real access real users of real reference sources have to real data in order to retrieve the required information as quickly and as successfully as possible. The medium of the reference source (dictionary, text book, manual, etc.) is not important. What is important is to create a situation where the required data is accessible and can be found in the quickest possible time. This cannot be done by applying linguistic theory but lexicographic theory creates the possibility to devise access processes that can also be put to good use in other reference sources. This should not be regarded as an attempt to lexicographise the wider area of reference works but rather an attempt to show a de-lexicographisation of certain lexicographic procedures allows a much more general application and use.

2. Information society

For at least the past twenty years we have spoken about the information society, a community in which everybody has quick access to all forms of data from which everyone can retrieve in a safe and easy way every type of required information. The factual situation is that we currently experience an enormous and explosive increase in stored data. According to research done in 2003 at the University of California, Berkeley, cf. Lyman/Varian 2003, there is an annual production of 5 million exabytes data in the fixed media, i.e. printed, film magnetic as well as optical storage (excluding telephone, radio, television and internet). How much this is, is clear from a comparison with the biggest university of the world (the Library of Congress) with 19 million titles, i.e. about 10 terabytes. Five exabytes correspond to 500 000 times the collection of all books in the world's biggest library. In addition one should realise that the available information collection shows a steady growth – in the period from 1999–2002 it expanded with 30%, cf. Pálfi (2009). Unlike the situation 50 years ago this data is not only available in libraries or expensive and often difficult to acquire books but in many instances also by means of a mere mouse click on each computer that is connected to the internet; in principle in any case. As a result an information search often leads to information stress, i.e. a long, cumbersome and uncertain access to the needed information. In many instances the search is so time-consuming and so many results are achieved, often only comprehensible for experts but not for laypersons, that instead of an information gain we

can rather talk about information death. This phenomenon prevails especially in Google searches, i.e. when endeavouring a very general search in an unordered data set. If, for example, you are searching for the word *accounting* you obtain more than 150 million hits. In these cases it is usually sufficient for the person searching the information to look at the first five or six hits. But also when searching in an ordered data set, e.g. text books, manuals, user guides, encyclopaedias or dictionaries, i.e. reference works, one often experiences that the search is time-consuming and that it cannot be performed in such a way that it can be completed within a time that is acceptable to the searcher. *Acceptable* remains an elastic predicate because for one person everything lasting more than 20 seconds is totally unacceptable whereas someone else, also urgently requiring information, is willing to invest minutes or even hours in the search process.

In metalexicographic contributions it has thus far been taken for granted that everyone with an information need consults a dictionary (or lexicon or encyclopaedia). It is obvious that one looks for information assistance where you expect the necessary help and especially in those information sources that are available to the person looking for the information. Someone who writes a text and does not know how the diminutive of a given noun is formed usually first consults a dictionary but, may be, also a grammar. However, when knowledge is needed regarding the diminutive formation possibilities of a language the user will be more inclined to consult a grammar and perhaps also a dictionary when it contains a dictionary grammar. For the user the type of information source is not important. Important is that he/she retrieves the exact required information as quickly as possible. With regard to professional translators Nord (2002: 175) has determined that these translators employ a wide range of aids. For one group of professional translators the consultation per type of aid was as follows (with the percentages referring to the use of the different types of aids):

- Persons 6.4%
- Looking in texts 13.3%
- Atlases / Chronicles 0.8%
- Self-made word lists 5.2%
- General encyclopaedias 2.2%
- Special encyclopaedias 6.0%
- Monolingual general language dictionaries 11.3%
- Synonym dictionaries 2.0%
- Other special monolingual dictionaries 1.8%
- Bilingual general language dictionaries 19.3%
- Monolingual and bilingual specialised dictionaries 31.3%
- Other special bilingual dictionaries 0.4%

Although the users have used different types of dictionaries in 74% of the cases, they have used bilingual dictionaries in only 21% of the cases, or perhaps slightly more because Nord (2002) did not distinguish between mono-, bi- and polylingual specialized dictionaries in her survey. The exact figures are not really decisive here. What is important in the first place is that the users utilise every information source without hesitation. Also important is something Nord (2002), like most lexicographers (with Wiegand (1998) a noticeable exception), fails to investigate: How long a search lasts and how much time a professional translator can and will invest in searching a specific aid. The answer to the last question is evident because it is known that professional translators work under enormous time constraints. But also from the many metalexicographers proclaiming over the last forty years that they work and do research in a user-directed way one gets the impression that new ideas are developed from the sole perspective of the lexicographer (or linguist) by means of an analysis of existing dictionaries. Although mention is always made of the user it is mostly done with reference to unrealistic and non-representative surveys. Hardly ever mention is made of the search process from the perspective of the person looking for information and as a description of the search route and the time used for it.

In the seminal contribution on lexicographic structures by Hausmann and Wiegand (1989) access to the dictionary data is seen as identical to the macrostructure (in some dictionaries) or as a part of the macrostructure (in dictionaries with additional access possibilities by means of outer texts). Access is then regarded as user-independent, as with the available structures in printed dictionaries. Access starts with the choice of the appropriate information source and goes via the lemma list or an index directly to a specific data type. But by merely looking at dictionary consultation procedures in general it is clear that real users often do not follow the most simple and direct route as envisaged by the macro- and microstructure that the lexicographer has selected. Real users typically let their fingers or eyes go up and down, often several times. Often when they have reached a specific article they don't start from the top but rather from the end of the article, e.g. when they look for a fixed expression and they have learnt from their experience in dictionary use that fixed expressions would more likely be at the end rather than at the beginning of the article. They move on to a new article and after a while perhaps back to an article that they have previously looked at. This happens in both printed and electronic reference works. It is no criticism against the theories of access structures to regard them as theories for the practice of lexicographic work and the analysis of existing dictionaries and not as theories for dictionary access by the user. Of more concern, however, is the fact that access to data in electronic dictionaries is not discussed in either Hausmann/Wiegand (1989) or in Wiegand (2007, 2008). It is explicitly excluded from these last two sources.

The prevailing access structure theories not only lack an account of the actual access process as users experience it but they are also restricting because a considerable number of lexicographic products are excluded. We are convinced that there is a good motivation for the selected limitations in the works of Wiegand and Hausmann/Wiegand. This is because the access structure is seen as identical to or as part of the macrostructure. Therefore such a discussion cannot include electronic dictionaries because in principle they have no macrostructure – in those cases where they are not a direct representation of a printed dictionary and only accessible via the full text where the dictionary articles have a fixed ordering as in printed dictionaries. Even when parts of the lemma list in an electronic dictionary are accessible in some order the dictionary still has no macrostructure because the dictionary was not "born" with a fixed sequence. The way in which the individual elements or articles have been ordered in the computer programme has nothing to do with the macrostructure as it prevails in printed dictionaries. In many dictionary editing programmes the single entries are numbered according to their inclusion in the programme, but this is irrelevant for both lexicographer and user. But even if Hausmann/Wiegand (1989), Wiegand (2007, 2008), Bergenholtz/Tarp (1995) or Gouws/Prinsloo (2005) had accounted for the access in electronic dictionaries the theory would still have been incomplete. What is needed is a theory that makes provision for access to data in all types of information sources. Such a wide-ranging and comprehensive theory and description of the search for data and the access process cannot be presented here in any detail, cf. Bergenholtz/Gouws (2008) for more detail in this regard. It is also clear that such a theory cannot be motivated in terms of linguistic theory but is motivated in accordance with lexicographic theory.

We would only like to present some basic ideas and propose some of the required terms. It is important that this discussion be directed at data access and the access process, not only in printed and electronic dictionaries but in all forms of reference works, including text books, manuals and all types of user guides. Access and not the access structure and therefore neither the macrostructure is the topic. It is also noteworthy that for printed reference works there are more resemblances between a text book with one or more indexes and a dictionary with a systematic macrostructure than a dictionary with an alphabetical macrostructure. We will only discuss case studies with a few dictionaries and text books but the method, the terms and the supporting theory are in principle the same for all types of information sources; at least from the perspective of the person looking for information.

3. Terms needed to discuss the access process

An important phase in the initial and continued development of any discipline is the establishment and standardization of relevant terminology. The last two decades saw the introduction of numerous terms used in lexicography to complement the existing terms of which many stem from the field of linguistics. One of the focal areas in the development of dictionary typologies has been the category of LSP, i.e. language for special purposes, dictionaries. Lexicography itself became the topic of a number of LSP dictionary projects, cf. Bergenholtz et al. (1997), Burkanov (1998), Hartmann/James (1998) and Wiegand et al. (currently in preparation). In terms of Bergenholt/Tarp (1995) LSP dictionaries can be classified as subfield, single field or multifield dictionaries. The nature and extent of the dictionaries of lexicography give a clear indication that they should not be regarded as dictionaries portraying a subfield from the more comprehensive field of linguistics but that they are single field dictionaries in their own right.

These LSP dictionaries of lexicography reflect the lexicographic terminology prevailing at the time of compilation and it is interesting to note the vast development in this regard. New perspectives and the subsequent new subfields within lexicographic research lead to an increasing need for new terms. This is also evident from research focusing on various aspects of the access process. Terms are not merely introduced for the sake of terms but the introduction of new terms reflects the dynamic nature of the underlying theory. Its application compels lexicographers to extend the terminology of their discipline. An innovative look at the access process also demands new terms to describe the different aspects. Although a number of relevant terms, applicable to all types of reference works, have been introduced in Bergenholtz and Gouws (2008: 243 f), there still is a need for further terms without which a realistic description of the access to data in e.g. dictionaries, text books, manuals and user guides is not possible.

The most significant gap can be filled by the term *search time* (earlier already referred to by Wiegand (1998: 458). With the exception of the term *combined search strings*, that is only used in electronic dictionaries, the following terms apply to printed and electronic information sources. In printed books there are different works available to give account of different types of users and functions. In reality this also applies when an electronic database offers different search and presentation possibilities. Quite often such a database is referred to as ONE dictionary but there are actually different ones, just as it is possible to print a variety of extracts for completely different dictionaries from one database.

The following list of required terms is given as far as possible in the sequence of the access process. This cannot be done in a consistent way because some parts of the process can be omitted and some can be mutually exclusive.

• The origin of the problem

There can be many reasons for the origin of an information need. They should be called extralexicographic and should be conceptually separated from the usage situations of the information source. These usage situations are traditionally divided into communicative and cognitive situations (although recently also a third type of situation, the so-called operational situation, has been discovered, cf. Tarp 2008b). There are various communicative situations, of which the most important are:

- production of text in the mother tongue
- reception of text in the mother tongue
- production of text in a foreign language
- reception of text in a foreign language
- translation of text from the mother tongue into a foreign language
- translation of text from a foreign language into the mother tongue

Cognitive situations refer to situations where the users for one or the other reason need to add to their existing knowledge, e.g. where they have doubts or problems about a specific topic. The needs do not have to be of a concrete nature but it could also be some form of inquisitiveness or even boredom. Especially in log files it can be seen that users often take the opportunity to look at recently completed dictionary articles when the lexicographer frequently make them available for the users in a special list in an outer text. Operative functions are known at best from manuals and user guides but they also occur in text books and dictionaries when one is instructed to do something or to refrain from something or when there is an explanation of how to do something.

- **Information source usage situations**

An information source usage situation refers to a situation where there is at least one available information source as well as the necessary time and energy to consult one or more of these sources.

- **Choice of information source**

The situation and the type of user will determine whether someone looking for information will turn to a printed dictionary, an electronic dictionary, a text book, an acquaintance, a Google search or any other aid, cf. the results of a survey of professional translators mentioned above (Nord 2002: 175). When Nord's investigation was done Google had not been used as frequently as it is today but the specific numbers are not important here. What is important is the fact that the users, here translators, choose and use those aids that they regard as helpful.

- **Choice of the component of an information source**

In accordance with the reference needs stemming from a communication, cognitive or operative situation one would consult bigger or smaller or even minute components of an information source. In accordance with the choice of information source one would first consult the table of contents, index or another outer text. In dictionaries one would usually go directly to the lemma list but in dictionaries with a dictionary grammar or a systematic introduction one might first look there.

- **Consultation of an information source**

For each situation where a source is consulted one can talk about a consultation. In some instances a single consultation could be linked to different search strings. There may be chains of consultations in instances where information may create the need for more information and follow-up consultations.

- **Search string**

In printed books one would rather talk about *search word* or *search expression*. It is the expression that the user has in mind when searching, or which he feeds into the electronic sources. In a printed dictionary the user knows from experience that one usually looks for the basis form of an inflected lexeme which can be found in the heading of a dictionary article, i.e. the lemma. However in e.g. printed specialised dictionaries, idiom dictionaries or dictionaries of **proverbs** one can also look for multiword expressions. This also applies to all forms of text books and manuals. In all forms of printed reference works with a register of meanings or concepts one can execute a semantic search by employing an appropriate search string. In printed works one can employ all types of search strings to execute a search on both the expression and the contents by going directly to a semantic field or a field with meaning annotations. In printed works a cross-reference can start a new search or continue an existing one, as is the case in electronic works, where there may be many links that could also be used extensively. According to existing log file investigations the Danish music dictionary (2009) shows 58% uses of links in contrast to 42% uses of writ-

ten search strings. The number of given search strings is considerably smaller than the number of consultations because often multiple search strings, including links, are needed before the required data is found.

- **Search option**

This expression comes from the terminology that has been established for electronic searches. One can assume that a string is identical to the item in a specific field (in electronic dictionaries often the lemma field) or one can search at the start, the end or within one of these fields, within a specific part or within the complete work as a free text search. This is also possible in printed books where one would accordingly search in the table of contents or in the chapter headings, and in dictionaries at the start of the lemma field but in dictionaries of fixed expressions often in the middle of the lemma field, e.g. in a dictionary of idioms where one can look for the expression *cut off one's* ***nose*** *to spite one's face* with the search string *nose.*

- **Situation-oriented access**

In monofunctional information sources the situation type is predetermined. It could e.g. be a dictionary for the communication situation of text production (e.g. the LONGMAN LANGUAGE ACTIVATOR 1993, DANSKORDBOGEN 1999) or text reception (e.g. LETH 1800), or translation (like many bilingual dictionaries). Accordingly there are information sources for cognitive situations (e.g. many encyclopaedias and the majority of text books) or for operative situations (like the most user guides). In polyfunctional information sources the user can try to access that part of a dictionary article or of a chapter in a text book that seems relevant to satisfy a specific need. In electronic databases one can employ your own search functions to obtain different articles according to the given function. Here one can talk about different dictionaries that come from the same database but with different titles and that can also be printed in quite diverse editions, like the following dictionaries in the data base of fixed expressions: BETYDNING AF FASTE VENDINGER 2009, BRUG AF FASTE VENDINGER 2009, FASTE VENDINGER MED EN BESTEMT BETYDNING 2009, VIDEN OM FASTE VENDINGER 2009.

- **User type-oriented access**

In printed dictionaries one can distinguish different works, e.g. for laypersons, semi-experts or experts or school learners in a specific age group. In electronic dictionaries access to different presentations is possible via a function button for each user group, cf. Bergenholtz/Kaufmann (1997). But also here one can talk about different works.

- **Accuracy of the access and the data presentation**

In a printed work an accurate and rapid search can be made easier by means of subheadings, appropriate markers but also the grouping of lines. The same possibilities exist in electronic works but in addition an exact search can be achieved so that only the given search string and the relevant associated entries are presented.

- **Combined search strings**

This only applies to electronic reference works where one can perform an intelligent search with the help of Boolean operators for obligatory, facultative, or excluded search strings or search methods as indicated above, e.g. in user-oriented access.

- **Access by means of an alphabetical macrostructure**

This only applies to a dictionary, a telephone directory or a text book with an alphabetically ordered set of items. An electronic reference work usually does not have an alphabetical macrostruc-

ture. By means of the table of contents, index or a search with a specific search string one can go directly to the part of the work you need to see. In dictionaries it would be a dictionary article.

- **Access by means of a systematic macrostructure**

Searching in a dictionary with a systematic macrostructure, a text book, a manual or something similar the access will typically proceed from the table of contents or an index. When reference is made to a chapter the user will read on as in a dictionary article but here possibly by skipping certain parts regarded as irrelevant. In electronic dictionaries and text books one usually gets a direct reference to the place where the search string can be found.

- **Index access**

Users can employ an index access only in printed dictionaries with one or more indexes. In electronic information sources this is possible in a few works by means of the search mode developed by the author of the work, with the possibility of reaching the required place by means of a partial index or the complete index. One can then either go to the chapter heading, where applicable the item giving the lemma, or go directly into the text, where relevant a dictionary article.

- **Search in a part of a component**

When a user reaches a specific part of a component, either a section in a text book or a dictionary article, the article structure (in dictionaries) or subheadings or headwords on the edge of the page can be helpful to achieve a more rapid access. It is important to note that the real person looking for information does not proceed in a linear way, i.e. not from the beginning of a chapter or a dictionary article but sometimes from the back, repeating some partial processes because new ones did not give the necessary results.

- **Search route**

The German equivalent for this term is *Suchpfad*, and in English it is also referred to as *access route*. It encompasses the process from the selection of an information source up to reaching the destination or destinations in the information source and the eventual conclusion of the search in terms of the specific consultation as either successful or unsuccessful.

- **Search step**

This refers to the clearly distinguishable phases from the first step in the search to the next, e.g. from the selection of a dictionary up to the selection of a component of the dictionary or from the stage in the letter *S* up to the required article starting with the letter *S* has been found. This also applies to all other types of information sources: With every change in the search route, when the direction of the search or the place of the search is changed, a new search step is introduced. The use of this term is not unambiguous because it depends on the circumstances of how the search is observed. When a user is observed that talks to himself loudly during the access or has been instructed to do so, the investigation will be able to show more search steps compared to an investigation without such comments.

- **Search speed**

This term refers to the time from the start of one stage up to the next stage. In this investigation the search speed was not recorded but it could be interesting in further investigations where one wants to isolate the separate search steps because they could be extremely time-consuming or very fast.

- **Search time**

This refers to the total time of a given consultation, i.e. from identifying the problem up to the successful conclusion or a negative termination of the search. Search time can then be seen as the duration between the first search step and the last or the sum of the search speed.

4. Accessing various types of reference sources

It is maintained in this contribution that an access process is needed when consulting a variety of different types of reference sources. These sources include e.g. dictionaries, encyclopaedia as well as text books. It has been argued convincingly in lexicographic publications, cf. Wiegand (1984), that lexicography is a scientific practice leading to the publication of dictionaries. This practice is based on models derived from lexicographic theory. The publication of each dictionary needs to be preceded by the formulation of a dictionary plan which makes provision for a clear exposition of the structures, contents and functions of the envisaged dictionary. The access and various search routes leading to the different types of data planned for a given dictionary need to be discussed as part of the dictionary plan. With the access process being a research topic in lexicography one would be inclined to argue that dictionaries should therefore offer better access to the data entries compared to other non-lexicographic reference sources. In the following section this hypothesis will be put to the test by comparing the access process in dictionaries with the access to comparable data entries in another type of reference source, i.e. linguistic text books, especially grammars.

4.1. Case-study regarding access to fixed expressions in dictionaries

Hardly a day passes by without one hearing on the news of a new survey questioning the attitude of the population on some issue. These surveys can be informative if they are representative and the questions compiled in accordance with the methods and the latest views in the social sciences. Decision makers employing their specific criteria will determine what these results are eventually used for. Surveys are often also used in lexicography. As far as we are concerned, cf. also the comprehensive overview in Welker (2006), these surveys are too executed by means of non-representative questionnaires and this already questions their value. The questions are often uninteresting. Even more problematic is the fact that the questions are either formulated in the form of memory questions (e.g. “Which type of item have you often/never looked for?”) or they are directed at the expected future questions the users will probably be looking for in dictionaries (e.g. “Which types of items are very important in dictionaries: grammar, meaning, etymology, pronunciation, etc.?”). Such questions are not relevant for the real use of dictionaries. These questions do not negotiate as point of departure the fact that dictionaries are instruction books that should supply real dictionary users with answers in real situations of dictionary use, e.g. a mother-tongue speaker with a reception problem or a foreign language speaker with a text production problem in the foreign language, cf. therefore the severe criticism by Tarp (2008).

For this research two case-studies have been done. Neither of these should be regarded as either a real survey or a set of questions put to an incidental passer-by. A controlled case-study has been performed albeit that only one respondent was used in each case. The value and status of a case-study in scientific research, even with only one respondent, should not be underestimated, cf. Flyvbjerg (2006) in this regard. Kuhn (1987) argues convincingly that a discipline without a large number of thoroughly executed case studies lacks a systematic production of exemplars and this leads to it becoming ineffective, cf. Flyvbjerg (2006: 242).

The respondents used in these case-studies were asked to answer specific questions using specific reference works under controlled circumstances. In the first case-study the respondent was asked to find the meaning of a fixed expression in specific dictionaries. There is no doubt that different respondents would not have needed the same time to find the fixed expression. Neither is it a question that varying experience in using dictionaries would have rendered different results,

with the more experienced user having a quicker and the less experienced user a slower access. The reading abilities and experience of different respondents would most likely also have led to different results. But it was not the aim of the case studies to lead to general remarks regarding reading abilities and experience in the use of reference works. The aim was to determine whether different access procedures apply to different reference works, also within one typological category, e.g. the broad category of dictionaries. For this purpose a single respondent is sufficient because the comparison of different reference works and not different persons is important.

In the first case-study the selected test person (respondent 1) is 63 years old, female, an academic but not a linguist. She reads a lot and often uses text books and dictionaries, almost every day. Another person would undoubtedly have needed more time to find the fixed expressions. In a control test the control respondents have needed two to five times as long to find the given fixed expressions, cf. Bergenholtz (2009). The given time in this case-study should therefore not be seen as absolute but as a relative comparison of the use of different dictionaries by one person.

In the first case-study the following dictionaries were used: the single volume NUDANSK ORDBOG (2005), the six volume DEN DANSKE ORDBOG (2003–2005), ORDBOG OVER DET DANSKE SPROG (1918–1956) in 28 volumes as well as the five supplement volumes ORDBOG OVER DET DANSKE SPROG SUPPLEMENTSBIND (1992–2005) (in combination referred to as the ORDBOG OVER DET DANSKE SPROG (printed)), the single volume idiom dictionary TALEMÅDER I DANSK (1998), the single volume DANSKE TALEMÅDER (1998), the internet edition of the already mentioned twenty eight volume dictionary ORDBOG OVER DET DANSKE SPROG (Internet) (2008), as well as both genuine internet dictionaries, the general language DEN DANSKE NETORDBOG (2008) as well as a dictionary of fixed expressions BETYDNING AF FASTE VENDINGER (2009). The case-study was therefore conducted with five printed dictionaries, including the twenty eight volumes of the ORDBOG OVER DET DANSKE SPROG and the five supplement volumes, treated as a single dictionary, as well as three electronic dictionaries.

When the respondent consults a dictionary the leader of the case-study can partially detect the way in which it is used but only to a certain extent. We have observed the reference process and described the different search steps of the respondent on an audio tape. The interviewer sat close to the respondent and was able to detect the different consultation procedures, e.g. how the respondent searches, e.g. for specific letters in the lemma list or for a specific lemma. The interviewer could also see when the respondent has found a given dictionary article and how the search proceeds within the article. It is clear when the required data has been found because the respondent says it out loud. However, one cannot say how many items the respondent has read in a given article but you can see when the respondent reads onwards or backwards. The case-study leader can also see whether the respondent is looking for a new place in the dictionary and can guess which search string is being used (because the case-study leader is familiar with the fixed expression). When a dictionary article exceeds a single column, it can be indicated that the respondent is paging on when the search proceeds without interruptions. It can also be indicated when a new volume of the same dictionary is used. In one way the case-study is not realistic because a real situation of use would include a few steps prior to the first consultation in this case-study, specifically with regard to the selection of the reference source. The duration of the search is measured with a stop watch which is only stopped when the respondent says:

1. I have found the expression and the required meaning, or
2. I quit, I cannot find the expression, or
3. I might perhaps have found the fixed expression and the meaning, but I am not sure.

In principle the case-study leader can only describe the movements of the respondent but a few times the respondent spoke loudly to herself and this resulted in a more precise and detailed description. However, she had not been instructed to talk to herself or to refrain from doing so. Throughout the procedures the case-study leader spoke softly into the microphone of the tape

recorder in order not to disturb or influence the respondent. For the different components of the case-study, i.e. the different responses to the individual questions, the required dictionary, or dictionaries in the case of the multivolume dictionary, were put on the table. A real dictionary user would need time to find the appropriate dictionary and to bring it to the desk. For the test involving the electronic dictionaries the case-study leader had the relevant dictionary before the start of the text available on the screen, ready for use. Whether the real user would want to use the given dictionary or would first like to look for another appropriate dictionary would have increased the time duration. Consequently neither the individual components nor the concluding data refer to the time duration in real situations (it would have been longer due to the above-mentioned reasons). Neither does the case-study reflect on the time needed by different users or even a selected representative user group. What is of importance is whether one can make specific systematic observations and have the subsequent descriptions of the search process in dictionaries designed in different ways.

Each component of the case-study was introduced by giving the respondent a sentence in which a part was highlighted in yellow. The assignment was explained as follows: Find the meaning in the marked expression in the following dictionary. The case-study component (3) can be given as an example where the following sentence was given (here printed in bold):

> Man kan **ikke skære alle over en kam**, men faktum er, at de værste kriminelle her i landet ikke er danskere. [One cannot treat everyone alike but fact is that the worst criminals in this country are not Danes.]

The marked expression was given within an example sentence to show the typical context in which the expression occurs. The transcribed version of the description of the case-study in the monolingual NUDANSK ORDBOG is as follows: 'The search is for the letter *S*, the lemma *skære* is looked for. In the very long article she is starting form the end of the article. After 47 seconds no appropriate item has been found. Then the search continues under the letter *K* for the lemma *kam.* In this article the relevant fixed expression with its meaning is quickly found. It took one minute and 47 seconds.'

This description is given in a table in the form of a condensed explanation of the individual steps. Here we have two examples in one search for the expression *skære alle over en kam* (literally: to shear everyone over the same comb. Meaning: "a whole group is judged in the same way quite negatively, without considering their individual differences and abilities") from the single volume general language printed dictionary and the internet edition of the 28 volume national documentation dictionary:

dictionary	**search steps**	**search time**	**result**
DEN DANSKE ORDBOG (single volumes of a 6 volume general language dictionary)	10 (volume 5, *S*, *skære*, reading the article from top to bottom, back again, volume 3, *K*, *kam*, reading the article, page, found.)	59"	positive
ORDBOG OVER DET DANSKE SPROG (Internet edition of the 28 volume general language dictionary)	2 (*kam*, search in the dictionary article for *skære*, found expression)	32"	positive

Different respondents will definitely react differently. Because this case-study only involves one person one can compare the search route and search time for different dictionaries but no generalizations can be made regarding the time consumption of all users. This respondent apparently found the fixed expressions very quickly whereas, in comparison, two other respondents needed in general two to four times as much time to obtain the results of this respondent. The search of a second respondent (44 years of age, academic but not a linguist) for the same fixed expression in the same dictionaries took almost twice as long:

dictionary	search steps	search time	result
DEN DANSKE ORDBOG	10 (Volume 5, *S*, *skære*, reads the article from the top, back again from the bottom to the top, once again from top to bottom, return volume 5, takes volume 3, *K*, *kam*, found the expression)	2' 7"	positive
ORDBOG OVER DET DANSKE SPROG	4 (Search for *skære over en kam*: no success, search with the search function of Explorer for *kam*: yet again no success. then with the search function for *over kam*: no success, then with the search function looking for *over*, found expression.)	1' 8"	positive

There are two important criteria when evaluating the use and the quality of a dictionary: (1) Can the required data be found in the dictionary? More precisely: Can the user find the item that contains the answer to the question that prompted the search? One could e.g. see that *ude i hampen*, an expression indicating that a given statement or act is exaggerated or untrue, could be found in the printed version of the ORDBOG OVER DET DANSKE SPROG but not in the electronic version of the same dictionary. (2) How long did the search take? Many users quit after a while, some sooner than others. The best dictionary is probably the one rendering a usable result in a short time. The interesting question is whether it can be explained that some dictionaries have a relative quick access and others a relative slow access. One cannot take it for granted that each dictionary user will continue searching for a full six minutes in the printed version of the ORDBOG OVER DET DANSKE SPROG, like our main respondent did. In general it is also noteworthy and amazing that in the first component of the case-study a multivolume dictionary (DEN DANSKE ORDBOG) had a much quicker search time compared to both small single volume specialized dictionaries of fixed expressions. A provisional explanation for this is that the multivolume dictionary employs good and clear markers, albeit that not many are graphic markers, to identify specific types of items. Contrary to this, the specialized dictionaries have an unclear layout and they could have had a much quicker access if one or more indexes had been added.

Something else is quite apparent in the first component: the static description of access, with the access structure regarded as identical to or as part of the macrostructure, as in Wiegand (2007, 2008), does not comply with the real user situation, where one can see, e.g. in the printed edition of ORDBOG OVER DET DANSKE SPROG that the user often moves down and up like a yo-yo in the same article, and often also moves from one volume to another and back again in a multivolume dictionary.

The search for the fixed expression *ude i hampen* (literally: outside in the hemp, meaning "a specific statement or action is totally exaggerated or even untrue") rendered the following results:

dictionary	search steps	search time	result
NUDANSK ORDBOG (single volume, general language dictionary)	3	18"	positive
DEN DANSKE ORDBOG (single volumes of a 6 volume general language dictionary)	4	31"	positive
ORDBOG OVER DET DANSKE SPROG (28 volume general language dictionary)	15	5' 46"	positive
TALEMÅDER I DANSK (single volume dictionary of idioms)	3	54"	negative
DANSKE TALEMÅDER (single volume dictionary of idioms)	4	56"	positive
ORDBOG OVER DET DANSKE SPROG (internet edition of the 28 volume general language dictionary)	7	1' 36"	negative
DEN DANSKE NETORDBOG (general language internet dictionary with almost twice as many entries as in the 6 volume printed dictionary)	3	39"	positive
BETYDNING AF FASTE VENDINGER (internet dictionary with more or less 12.000 fixed expressions)	3	14"	positive

The tendency in the next component of this case-study confirms that a single volume dictionary can be used just as easy, i.e. quickly, as a multivolume dictionary, compare in this regard the results from the single volume NUDANSK ORDBOG with that of the 6 volume DEN DANSKE ORDBOG. It is also true that electronic dictionaries do not have a clear advantage with regard to quick access, compare in this regard the single volume dictionary of idioms DANSKE TALEMÅDER with the elec-

tronic general language dictionary DEN DANSKE NETORDBOG. The search routes are, so we believe, typical for each dictionary consultation. There is no clear fixed route, that unambiguous route of the macro- and microstructures as described up to now in metalexicography. Instead, there are consultations where the user jumps from one spot to another in the dictionary and often reads through the same dictionary article more than once. Often but not always a successful search takes longer, compare in this regard the result for TALEMÅDER I DANSK in the following tables. The search was for the fixed expression *et barn på gule plader,* (literally: a child on yellow numbers, meaning: "a child lives in a family where either the mother or the father is his/her biological mother or father"):

dictionary	**search steps**	**search time**	**result**
NUDANSK ORDBOG	7	2' 17"	negative
DEN DANSKE ORDBOG	6	58"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	12	4' 36"	negative
TALEMÅDER I DANSK	7	57"	negative
DANSKE TALEMÅDER	7	42"	positive
ORDBOG OVER DET DANSKE SPROG (Internet)	8	1' 52"	negative
DEN DANSKE NETORDBOG	3	42"	positive
BETYDNING AF FASTE VENDINGER	2	20"	positive

The next component of the case-study is one where the required fixed expression was found in all the dictionaries. However, the access routes and the search time show vast differences. One can distinguish two groups: (1) the first three printed dictionaries in the following table which had a very slow access, and (2) all the other dictionaries where two of the electronic dictionaries had a slightly shorter search time than the others but with almost similar rapid access. The search was for *skære alle over en kam* **(**literally: to shear everyone over the same comb. Meaning: "a whole group is judged in the same way quite negatively, without considering their individual differences and abilities"):

dictionary	**search steps**	**search time**	**result**
NUDANSK ORDBOG	6	1' 16"	positive
DEN DANSKE ORDBOG	10	59"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	4	1' 9"	positive
TALEMÅDER I DANSK	4	31"	positive
DANSKE TALEMÅDER	4	32"	positive
ORDBOG OVER DET DANSKE SPROG (Internet)	2	32"	positive
DEN DANSKE NETORDBOG	3	17"	positive
BETYDNING AF FASTE VENDINGER	1	15"	positive

In the next component of the case-study the big difference between the slowest and the fastest access is conspicuous. Between the two poles, i.e. two printed dictionaries with search times in excess of two minutes and the electronic dictionary with only 22 seconds, are all the other dictionaries with a search time of approximately one minute and twenty seconds. The search was for the fixed expression *flygte over hals og hoved* (literally: to flee neck over head = head over heels, meaning: "to do something suddenly and with great speed"):

dictionary	search steps	search time	result
NUDANSK ORDBOG	4	48"	positive
DEN DANSKE ORDBOG	9	1' 7"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	11	3' 43"	positive
TALEMÅDER I DANSK	5	44"	positive
DANSKE TALEMÅDER	8	1' 18"	negative
ORDBOG OVER DET DANSKE SPROG (Internet)	4	40"	positive
DEN DANSKE NETORDBOG	3	22"	positive
BETYDNING AF FASTE VENDINGER	4	52"	positive

In the next component it is noteworthy that the six volume dictionary almost has a similarly fast access than both the quick electronic dictionaries. Noteworthy is also that both the specialised dictionaries of fixed expressions have a slow access with many search steps and many leaps to different parts of the dictionary. Albeit for only one respondent it still remains noteworthy within the context of the case-study. Even a restricted case-study like this, shows that these dictionaries are in need of improvement, e.g., as already indicated, by adding one or more indexes. The search was for the meaning of *Liden tue kan vælte stort læs* (literally: a small trailer can tip a big car, meaning: "an apparently unimportant act can have a big effect"):

dictionary	search steps	search time	result
NUDANSK ORDBOG	4	1' 26"	negative
DEN DANSKE ORDBOG	3	25"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	8	2' 40"	positive
TALEMÅDER I DANSK	8	1' 2"	negative
DANSKE TALEMÅDER	12	1' 40"	positive
ORDBOG OVER DET DANSKE SPROG (Internet)	4	45"	positive
DEN DANSKE NETORDBOG	1	9"	positive
BETYDNING AF FASTE VENDINGER	1	16"	positive

Three dictionaries can be singled out for also having had the most rapid access in earlier components of the case-study, i.e. the printed six volume and both genuine internet dictionaries. A possible explanation could be that these dictionaries included the required fixed expressions. The results show that the time needed is always more when the searched item is not found. This can be seen in e.g. the single volume NUDANSK ORDBOG where the search time is almost similar to that of the 28 volume ORDBOG OVER DET DANSKE SPROG, where, in contrast, a positive result was achieved. The search was for the meaning of the fixed expression *Hvor godtfolk er, kommer godtfolk til* (literally: where good people are, other people will join them, meaning: "you have arrived in good company"):

dictionary	search steps	search time	result
NUDANSK ORDBOG	2	2' 12"	negative
DEN DANSKE ORDBOG	3	25"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	4	1' 2"	positive
TALEMÅDER I DANSK	6	1' 2"	negative
DANSKE TALEMÅDER	4	51"	negative
ORDBOG OVER DET DANSKE SPROG (Internet)	7	1' 3"	positive
DEN DANSKE NETORDBOG	2	33"	negative
BETYDNING AF FASTE VENDINGER	1	16"	positive

The next component shows vast differences between the search times and also the search routes. Apart from the printed version of the ORDBOG OVER DET DANSKE SPROG there is a clear distinction

between the dictionaries where the expressions have been found and those where they have not been found. It is also noticeable that the search in the printed and the electronic editions of the ORDBOG OVER DET DANSKE SPROG almost had the same search time, albeit that only the printed edition yielded a positive result. Our explanation for this is that the respondent could run a finger up and down in the printed edition that enabled her to look downward in a given area. This was not possible in the electronic edition where you are looking up at a screen. Apparently many users have a better overview when the matter to be read is horizontal and not vertical. At the same time the finger is for many, in any case for the respondent of this case-study, an important help in the concentrated search for a specific expression. The search was for the meaning of the fixed expression *sigte efter* (literally: to aim at something, meaning: "one has to reach or obtain something"):

dictionary	**search steps**	**search time**	**result**
NUDANSK ORDBOG	4	1' 28"	negative
DEN DANSKE ORDBOG	11	2' 47"	negative
ORDBOG OVER DET DANSKE SPROG (printed)	7	3' 31"	positive
TALEMÅDER I DANSK	2	34"	negative
DANSKE TALEMÅDER	2	29"	negative
ORDBOG OVER DET DANSKE SPROG (Internet)	8	3' 11"	negative
DEN DANSKE NETORDBOG	2	25"	positive
BETYDNING AF FASTE VENDINGER	1	16"	positive

The search times in the next component of the case-study are only noteworthy with regard to the printed edition of the ORDBOG OVER DANSKE SPROG, where a slow access prevails. For all the other dictionaries the number of search steps, the search routes as well as the search time are more or less equal, independent of whether the expressions were found or not. The search was for the meaning of the fixed expression *skrabe til sig* (literally: to scrape to you, meaning: "to attempt with desire to gather ever more material goods"):

dictionary	**search steps**	**search time**	**result**
NUDANSK ORDBOG	2	22"	positive
DEN DANSKE ORDBOG	4	27"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	3	1' 59"	positive
TALEMÅDER I DANSK	2	19"	negative
DANSKE TALEMÅDER	2	17"	negative
ORDBOG OVER DET DANSKE SPROG (Internet)	3	31"	positive
DEN DANSKE NETORDBOG	3	32"	positive
BETYDNING AF FASTE VENDINGER	1	16"	positive

In the next component all searches have been successful and almost all have had a very rapid access. Only the printed edition of the 28 volume dictionary ORDBOG OVER DET DANSKE SPROG caused problems and had a slower access. The reason, albeit not the only one, could be that the dictionary articles are very long. Long articles also occur in the 6 volume DEN DANSKE ORDBOG, but in contrast to the first dictionary this one has a series of markers that assist rapid searching, e.g. putting every new fixed expression in a new line as well as emphasising those expressions by means of bold font. The search was for the meaning of the fixed expression *lud og koldt vand* (literally: bleach and cold water, meaning: "someone is neglected"):

dictionary	search steps	search time	result
NUDANSK ORDBOG	2	14"	positive
DEN DANSKE ORDBOG	3	37"	positive
ORDBOG OVER DET DANSKE SPROG (printed)	3	1' 1"	positive
TALEMÅDER I DANSK	2	16"	positive
DANSKE TALEMÅDER	2	11"	positive
ORDBOG OVER DET DANSKE SPROG (Internet)	4	34"	positive
DEN DANSKE NETORDBOG	1	7"	positive
BETYDNING AF FASTE VENDINGER	1	16"	positive

In the last component of this case-study the specific problem occurred that the chosen example sentence contained the lesser known idiom variant *tage over åen efter vand* (to move across the river to get water) and not the more frequently used variant *gå over åen efter vand* (to go across the river to get water). Nine of the ten dictionaries contain only the more frequently used and not the lesser known variant. The respondent was unsure whether the expressions have the same meaning. Although it is the case the respondent did not know it. But that is why dictionaries are there and a broader selection would have improved matters where such uncertainties in dictionary use prevail. Besides the uncertainty something else was observed in this component. A distinction can be made between the two real electronic dictionaries and the specialised dictionaries for fixed expressions on the one hand and all the other dictionaries on the other hand. The first group had a search time of between 15 and 31 seconds but the others needed a much more complicated search route and subsequently a longer search time of more than one minute. The explanation can only be that the two specialised dictionaries don't have many entries and likewise the two genuine electronic dictionaries offer the possibility of a targeted search that does not have to follow the detour via the lemma. This does not apply to the last electronic dictionary which, in reality, is merely a digital version of a printed dictionary made available to the internet. The search was for the meaning of the expression *tage over åen efter vand* (to move across the river to get water, meaning: "to do something unnecessary"):

dictionary	search steps	search time	result
Nudansk Ordbog	6	1' 20"	uncertain
DEN DANSKE ORDBOG	7	1' 13"	uncertain
ORDBOG OVER DET DANSKE SPROG (printed)	5	1' 8"	uncertain
TALEMÅDER I DANSK	3	15"	uncertain
DANSKE TALEMÅDER	4	31"	uncertain
ORDBOG OVER DET DANSKE SPROG (Internet)	6	1' 1"	uncertain
DEN DANSKE NETORDBOG	4	28"	uncertain
BETYDNING AF FASTE VENDINGER	1	16"	positive

Nielsen (2008) introduced the term *information cost* with regard to the use of dictionaries. This is an important aspect of dictionary use that has previously not yet been discussed explicitly. But Nielsen's proposal has a fundamental deficit because he does not mention the notion of information gain explicitly. As in other contexts it will usually be the case that costs go along with possible gains. Nielsen does not negotiate this. In the case-study performed here it is clear that there are huge time costs when a negative result is achieved – in comparison to the searches when a positive result is obtained. In reality a dictionary user will undoubtedly opt for a slightly higher cost when it is connected with an information gain. We employ this line of argument in the following ranking of the dictionaries that were used. The ranking has a successful search as most important predicate and the search time as the second important. Both these rankings are given in the column behind the title of each. It should also be mentioned that the indication of the seconds has been rounded off upward and downward as applicable. The dictionaries are given in the order of

their rankings. It is important to note that the rankings as such do not play a determining role, cf. the concluding remark (paragraph 5):

dictionary	**average search steps**	**average search time**	**positive result + average search time**	**negative result + average search time**	**uncertain result + average search time**
BETYDNING AF FASTE VENDINGER (1) (1)	1,6	20"	10 searches 20"		
DEN DANSKE NETORDBOG (2) (2)	2,5	25"	8 searches 24"	1 search 33"	1 search 28"
DEN DANSKE ORDBOG (2) (5)	5,9	56"	8 searches 40'	1 search 2' 47"	1 search 1' 13"
ORDBOG OVER DET DANSKE SPROG (printed) (2) (8)	7,2	2' 39"	8 searches 2' 35'	1 search 4' 36"	1 search 1' 8"
ORDBOG OVER DET DANSKE SPROG (Internet) (5) (7)	5,3	1' 11"	6 searches 41'	3 searches 2' 13"	1 search 1' 1"
DANSKE TALEMÅDER (6) (4)	4,9	45"	5 searches 48"	4 searches 43"	1 search 31"
NUDANSK ORDBOG (6) (6)	3,9	1' 10"	5 searches 36"	4 searches 1' 51"	1 search 1' 20"
TALEMÅDER I DANSK (8) (3)	4,2	39"	3 searches 30"	6 searches 48"	1 search 15"

What makes a dictionary good? The answer is quite simple. It is a dictionary that quickly and securely gives the correct answer to a question posed by the user when consulting a dictionary – and not any other information source. The purpose of this case-study was not to determine the correct answer – the user does not know whether the answer is correct or not. The purpose was to determine which dictionary allows the shortest search time. From the case-study it is clear, and not surprisingly so, that a comprehensive electronic specialised dictionary with fixed expressions BETYDNING AF FASTE VENDINGER, that contains 12 000 dictionary articles and offers a range of intelligent access possibilities easily beats both the much more restricted specialised dictionaries (with 3 500 and 2 500 dictionary articles, respectively). It should also be considered that the three comprehensive general language dictionaries (DEN DANSKE ORDBOG, ORDBOG OVER DET DANSKE SPROG and DEN DANSKE NETORDBOG) contain much more data than the smaller single volume general language dictionary (NUDANSK ORDBOG) and can answer many more questions. But it does not suffice for a dictionary to contain the data. The user should also find it, i.e. be able to find it, before a search has to be terminated. In this regard electronic dictionaries have a distinct advantage by offering possibilities for a direct search of either the complete fixed expression or parts thereof, enabling a more rapid access. However, this does not apply to the internet edition of the ORDBOG OVER DET DANSKE SPROG, which in reality is only a printed dictionary that has been put in an unchanged format into the internet and offers only a few possibilities for a rapid and directed search. Even more surprising is the fact that the 6 volume DEN DANSKE ORDBOG has almost the exact same search time as the single volume NUDANSK ORDBOG. Surprising, as a positive evaluation of the 6 volume dictionary, is also that almost the same search time applies as in the case of the two specialised dictionaries for fixed expressions. This is even more surprising because both these dictionaries are relatively small and one would assume that the user should be confident to have found the relevant fixed expression or to have determined that it is not included in the dictionary

fairly quickly. It is quite clear that these two dictionaries do not have an optimal macrostructure and no optimal layout. A prerequisite for a rapid access in printed dictionaries is a layout with an adequate use of structural indicators, among others special signs, and graphical emphasis, cf. Almind (2005). Comparable demands can be put to electronic dictionaries, where the built-in possibilities for a well directed and intelligent search would be further prerequisites for a rapid access, cf. Almind (2005a).

4.2. Access case-study with a search for data in linguistic text books, spelling rule books and dictionaries

A case-study has been executed to determine the access of a user to certain data entries in a restricted variety of Afrikaans reference sources, i.e. two subsequent editions of the formal spelling rule book, linguistic text books, a text book for beginners in Afrikaans, and, in comparison, a monolingual explanatory Afrikaans dictionary. The books are Afrikaanse Woordelys en Spelreëls (8th edition) (AWS 8), Afrikaanse Woordelys en Spelreëls (9th edition) (AWS 9), Afrikaanse Grammatika vir Volwassenes (AGV), Norme vir Afrikaans (NA), Teach Yourself Afrikaans (TYA) and Verklarende Handwoordeboek van die Afrikaanse Taal (HAT). As reference sources the different books are aimed at specific user groups, ranging from learners of the language and general users of Afrikaans, typical lay persons and semi-experts, to linguists, experts in the field of linguistics, relying on these sources for a retrieval of the required information. Each book has a table of contents as well as an index, the typical helping aids in reference sources, to enhance access to the required data. One of the aims of the case-study was to determine whether access to data in these non-lexicographic works differs from access to similar data entries in dictionaries. Important is not only access to the data but also the duration of both successful and failed access procedures, i.e. the length of time a user is willing to try to find the relevant data before he/she quits. Quitting might be the result of the specific data not being included in the book or the result of the user not being able to find the specific data.

The case-study was performed by a single respondent and therefore does not claim to be a valid or representative test. Here the results of a case-study are presented and not a quantitative analysis of access processes. It merely gives an indication of the access process and time of a single language user trying to solve specific problems. The selected test person in this case-study (respondent 2) is a 64 year old male with a sound knowledge of linguistics and competent in using reference sources. The respondent had to solve six problems by trying to find the solution to each problem in each of the reference sources. All sources did not always contain the solution but the respondent did not know that. Part of the case-study had also been to determine the length of a search before the searcher decides to quit. The presupposition in this regard has been that systematic access will also lead to a quick recognition of those cases where the required data does not occur in a specific reference source. For each consultation procedure the respondent was given a written question. His search was carefully timed and during the search the actions were described on audio tape by the person conducting the case-study. The results of all six searches were then analysed, compared and described. The analysis of these questions will be discussed. These six questions included three specific and three more general ones. The questions were as follows:

1. Find the diminutive of the following word: *ring.*
2. Find the correct accentuation marks of the following words: *de, he, ne.*
3. What is the correct form: *fluit-fluit* or *fluit fluit?*
4. Explain the use of the circumflex in Afrikaans.
5. Explain the way in which compounds with one or more proper names as stems are written in Afrikaans.
6. Explain the formation of past participles in Afrikaans.

The different books display varying degrees of accessibility. The two editions of the spelling rule book, the AFRIKAANSE WOORDELYS EN SPELREËLS, can both be accessed via an index as well as a table of contents, although neither of these texts gives an optimal guidance in terms of finding answers to the questions used in this case-study. This led to a negative result regarding questions two and six in the ninth edition of the AFRIKAANSE WOORDELYS EN SPELREËLS.

Access to the answers in the two text books AFRIKAANSE GRAMMATIKA VIR VOLWASSENES and NORME VIR AFRIKAANS had been impeded by insufficient guidance in the indexes and tables of contents, displaying an inferior access structure. Quite often the respondent had to move forwards and backwards between index and table of contents without finding a partial search string that could direct him to the answers. Partial success was achieved twice in AFRIKAANSE GRAMMATIKA VIR VOLWASSENES, once by means of a cross-reference in the book to an external source where the answer would have been found and the second time by means of deducting the correct answer from comparable data in the text book. However, in spite of the partial success these results are indicated as negative because the respondent failed to find the relevant answers in the book.

Four times the searches in the text book for beginners TEACH YOURSELF AFRIKAANS failed because the relevant data has not been included in the book. The respondent soon realised how to use the scant index and register, displaying yet again an insufficient access structure, to determine whether the data was there or not. That resulted in quitting the search at an early stage without wasting time.

In the first component of the case-study the respondent had to find the diminutive of the word *ring*.

book	**search steps**	**search time**	**result**
AWS 8	4	3'19"	positive
AWS 9	5	1'26"	positive
AGV	5	35"	positive
NA	13	2'57"	positive
TYA	20	5'03"	positive
HAT	3	1'06"	positive

The answer to this question could be found in all six books and the respondent had a successful search in each case. However, the total search time for this question was the longest of all components of the case-study. This is primarily due to the fact that the respondent was not familiar with the different books and their respective access possibilities. In the first encounter with one of the editions of the AWS (the eighth edition) the respondent started the search in the table of contents but then realised that the guidelines are not sufficient. He then went to the index where he found the reference to the relative section. When consulting the ninth edition of the AWS he immediately went to the index – thus the search was shorter than that in the eighth edition, but access in the two editions of the AWS was cumbersome. The index of AGV contains only one reference to diminutives. The respondent started his search in the index and could quickly access the page where the formation of diminutives is discussed in order to find the answer. Cumbersome access also impeded the progress in the NA. The insufficient index and table of contents of TYA impeded the access process and the respondent needed twenty search steps and more than five minutes to reach the desired answer. The alphabetical order of HAT, the only dictionary in this case study, ensured quick and easy access.

For the second component the respondent had to find the correct accentuation marks of the words: *de, he, ne.*

book	search steps	search time	result
AWS 8	7	1'07"	positive
AWS 9	10	2'51"	negative
AGV	9	2'34"	negative
NA	10	2'04"	negative
TYA	5	54"	negative
HAT	5	1'15"	positive

The respondent did not realise that these three words belong to a small class of Afrikaans words where the use of the grave accent is compulsory in the spelling of the words. In the index of AGV access to the use of the grave accent is given as a subsection in the entry for orthographic signs other than letters. The respondent went to the register entry for phonetic data and in the central text did not find the three words although he did find a cross-reference to another source where the answer could be found. But the search in AGV yielded a negative result. In NA the respondent got confused by cross-references within the index. The entry *aksentteken* (accentuation marker) has a cross-reference to *skryftekens* (orthographic markers) and this entry has a cross-reference to *interpunksie* (punctuation). This entry in the index has a subentry *skryftekens* with a further subentry *aksenttekens.* Having been cross-referred from one index entry to the next without clear guidance the respondent decided to quit after 2 minutes and 34 seconds – without reaching the central text of the reference source. The problem is not treated in TYA, therefore the negative result, whereas the respondent failed to find the discussion of the class of words in AWS9.

In the third component the respondent had to determine the correct form: *fluit-fluit* or *fluit fluit?*

book	search steps	search time	result
AWS 8	8	1'54"	positive
AWS 9	6	56"	positive
AGV	10	3'09"	negative
NA	8	1'21"	negative
TYA	2	36"	negative
HAT	2	13"	positive

Being familiar with the access possibilities of the different books the respondent had little trouble to realise that neither the index nor the table of contents of TYA can guide him to the desired answer. He did not realise that the answer could not be found in the book but made a calculated decision to quit at an early stage of the search. Positive results were obtained quickly in the two editions of the AWS. In NA a similar confusion with cross-references in the index resulted in the respondent not finding the answer although the answer occurs in the book and although the respondent did manage to go beyond the register. His previous fruitless search influenced him to quit after a search of 1 minute and 21 seconds. In the monolingual dictionary access typically goes via the macrostructure of the central list. The first three components of the case-study were of such a nature that their answers could be found in a dictionary and the respondent had little difficulties in accessing the relevant article stretches, finding the relevant articles and identifying the appropriate items that gave the answers to the questions. On average, the dictionary had the quickest search time as well as the fewest search steps in these three components of the case-study.

In the fourth component the respondent had to find an explanation for the use of the circumflex in Afrikaans.

book	search steps	search time	result
AWS 8	3	16"	positive
AWS 9	5	18"	positive
AGV	3	1'10"	positive
NA	3	33"	positive
TYA	2	11"	negative
HAT	5	36"	negative

Being the spelling rule book for Afrikaans the two editions of the AWS contain the relevant rule and a reference to this rule was easily found in the index, ensuring rapid access and success. Positive results were also obtained in AGV and NA. In both these books the respondent started the search by going to the index and from there immediately to the relevant section in the central text. Although the same number of search steps were needed in both these searches it took the respondent longer to find the answer while searching in the central list. After a brief look at the rudimentary index and table of contents of TYA the respondent decided to quit – and rightfully so because the answer does not appear in this book. On average component 4 has the quickest search time as the fewest number of search steps. The reason is most probably the clear reference to the topic in the index of the different books where the successful searches were accomplished. The respondent had little trouble in identifying the relevant entries in the indexes.

In component 5 of the case-study the respondent had to explain the way in which compounds with one or more proper names as stems are written in Afrikaans.

book	search steps	search time	result
AWS 8	10	2'12"	positive
AWS 9	8	55"	positive
AGV	8	53"	negative
NA	10	3'27"	negative
TYA	4	36"	negative
HAT	8	51"	negative

The search in AWS 8 consisted of no less than 10 search steps. The respondent started in the index and moved to two different entries in order to get a reference to the central text. He then went to the table of contents, to the central text but could not find the relevant section. Then he went back to the index and then to the central text where he eventually found the solution. This search was impeded by insufficient guidance in the index. In NA the search consisted also of 10 search steps but it lasted 3 minutes and 27 seconds before the respondent decided to quit – although the book did contain the solution rapid access from either the index or the table of contents cannot be achieved that easily. From the table of contents and index of TYA the respondent could deduce that the solution would not be in the book. He stopped the search without wasting too much time.

In the last component the respondent had to explain the formation of past participles in Afrikaans.

book	search steps	search time	result
AWS 8	7	1'39"	positive
AWS 9	14	2'10"	negative
AGV	25	5'13"	negative
NA	8	1'27"	positive
TYA	3	59"	positive
HAT	0	00"	negative

A lengthy search in AGV with 25 search steps rendered a negative result because the solution is not to be found in this book. Having had troublesome experiences with the access possibilities in the different books the respondent continued for quite a while before deciding to quit. The lack of a clear reference in the index and table of contents had not been enough motivation to quit sooner because insufficient references in other searches did render positive results in some instances. This once again illustrates the importance of a clearly marked search route where the lack of clear references can be interpreted as indicating the absence of the specific data. HAT does not have a mini-grammar as an outer text and due to the nature of the last three questions there was no way in which the answers could have been found in a systematic way. The respondent tried to find directions from the outer texts for the fourth and fifth questions but realising that this type of data is not included in the dictionary he immediately realised there was no sense in looking for an answer to the last question.

Average search steps and search time per book

In the "book" column of each book the different rankings are given in brackets. As previously done for the books used in the Danish case-study this ranking has a successful search as most important predicate and the search time as the second important. These rankings are given in the column behind the title of each book.

book	average search steps	average search time	positive result + average search time	negative result + average search time	uncertain result + average search time
AWS 8 (1), (4)	6,5	1'44'	6 searches 1'44"	0	0
AWS 9 (2), (3)	8	1'25"	4 searches 54"	2 searches 2'30"	0
AGV (5), (6)	10	2'15"	2 searches 53"	2 searches 3' 03"	2 searches 3' 41"
NA) (3), (5)	8,6	1'58"	3 searches 1'17"	3 searches 2'49"	0
TYA (6), (2)	6	1' 23"	2 searches 3'01"	4 searches 34"	0
HAT (3), (1)	3,8	40"	3 searches 51"	3 searches 29"	0

From these results it is clear that the shortest search time does not necessarily imply the most successful consultation procedure or even optimal access. Neither does the book with the highest success rate also have the quickest access in terms of either search time or search steps. Being familiar with a specific source assists the user to realize when to stop a search in a case where the source does not contain the required data. Due to the general nature of the last three questions the solutions could not typically be found in a dictionary without a dictionary grammar. The lack of a dictionary grammar in HAT, led to the failure to find the solutions. Being familiar with this situation enabled the respondent to quit the search at an early stage. The same applies to the searches in the TYA. In the first three questions access to the required data was much quicker in the dictionary than in any of the text books. The structure and presentation of the two editions of the Afrikaanse Woordelys en Spelreëls show much stronger resemblance to that of dictionaries. Accessing data in these books was more successful than in the linguistic text books. The person conducting the case-study could note the problems the respondent had to find data in the text books due to an insufficient and far too general access structure. The user often had to go back to the register or table of contents and within a given section of the book he had to move forward and backward because the exact place where the data had to be found could not be ascertained unambiguously from the entries in the index or table of contents. Contrary to these often haphazard searches the

search in the dictionary had been much more directed and successful due to the primary access via an alphabetical macrostructure.

5. Conclusion

According to Haas (1967: 48): "A good dictionary is one in which you can find the information you are looking for – preferably in the very first place you look. Nothing could be sillier than the tacit assumption, far too commonly encountered, that it is somehow good for the soul of the user if he has to work hard to find what he is looking for." This statement by Haas has equal truth and validity in many other reference sources. The problem, however, is that too many authors or compilers of these reference sources fail to give ample attention to the need of rapid and successful access to the data contained in their reference sources. The fact that many reference sources are consulted rather than read, implies that the typical user does not read the source from the first to the last page but needs to find specific data needed to solve a specific problem in a specific situation of use. In order to be able to retrieve the required information the user needs to be guided to the specific place in the reference sources where the relevant data is accommodated. Successful retrieval of information has a well-designed access process as a prerequisite.

A route to ensure successful access to the data cannot be determined by an abstract model formulated by the compiler or author of the reference source. Empirical research is needed to determine the typical access problems of typical target users of a specific source. The identification of these needs and of the problems encountered by users in existing reference sources should enable the compiler or author of a reference source to devise a theoretically-based access process that can enhance the success of the practical consultation of the reference source. Within the field of metalexicography and dictionary research the problem of access is a well-defined research area. This focus on access differentiates lexicographic research from e.g. linguistic research. From the results obtained in these case-studies we cannot claim that dictionary A or text book A undoubtedly have a better or more rapid access than dictionary B or text book B. But we can say that for at least one user there have been noticeable access differences with dictionary A or text book A allowing a much more rapid access in certain instances. These case-studies show that it is possible to conceptualise and compile reference works that allow a more rapid access. This kind of access should be the aim when new dictionaries are conceptualised. However, linguistic theory does not make provision for such a conceptualisation. It falls within the scope of lexicographic theory.

This contribution has focused on some aspects of the access process to emphasise the way in which it accentuates the status of lexicography as an independent discipline. But this paper has gone further. By employing real case studies to determine and test crucial features of the access process, e.g. the notion of *search time* and *search steps*, it was shown how reference sources with a well-developed access structure enhances the success of the consultation process. This is not restricted to access to dictionaries. As an independent discipline lexicography can and should produce theories that can be applied in a much wider context to ensure, among others, better access possibilities in all types of reference sources in both printed and electronic format. Although there will always be an interactive relation between lexicography and linguistics, especially with regard to the linguistic contents of general language dictionaries, the lexicographic theory should not rely on linguistic theory.

With reference to their own book Atkins/Rundell (2008: 4) maintain: 'This is not a book about "theoretical lexicography" – for the very good reason that we do not believe that such a thing exists. But that is not to say that we pay no attention to theoretical issues. Far from it. There is an enormous body of linguistic theory which has the potential to help lexicographers to do their jobs more effectively and with greater confidence.' This statement can be regarded as of extreme danger for the development of lexicography. Lexicographic theory and not 'an enormous body of linguistic theory' should ascertain the nature of future dictionaries. Improving access to the data in dictionaries and in other reference sources can be one way of illustrating this point.

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