FROM USER QUESTIONS TO A BASIC MICROSTRUCTURE: DEVELOPING A GENERATIVE COMMUNICATION THEORY FOR A NAMIBIAN GERMAN DICTIONARY

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Abstract

This article reports on the initial planning stages of a Namibian German dictionary project, i.e. a dictionary that would primarily provide semantic information in Standard German about Namibian German lexical items. The concept of Namibian German is explained, and existing dictionaries of Namibian German are briefly surveyed. The theoretical framework is that of a new lexicographic theory, i.e. the theory of lexicographical communication. Within this framework, a new classification of three types of dictionary purposes is introduced, i.e. macro-contextual purposes, meso-contextual purposes and micro-contextual purposes. The focus then shifts to the development of a basic microstructure for the dictionary, which refers to a set of lexicographic messages encoded in lexicographic utterances that would be included in a dictionary article in order to answer specific potential target user questions. Pertinent elements of the theory of lexicographical communication are worked out to develop a basic microstructure for the equivalent relation of full equivalence. This demonstrates that the theory can be applied generatively, i.e. to develop a dictionary model starting from a set of empirically identified user questions relating to a particular user situation. In the process, a formal link between user questions, consultation objectives, lexicographic messages and lexicographic utterances is established. This is followed by an overview of how a basic microstructure could be amplified to ensure successful lexicographical communication.

1. Introduction

This article originates from the productive convergence of two of the core business activities at the University of Namibia (UNAM), namely teaching and research. Its aim is also twofold, as will be outlined below.

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With respect to teaching, an honours course in German Studies entitled "Applied Linguistics in German" traditionally includes a component on sociolinguistics with particular focus on Namibian German (hereafter "NG") as a case study in multilingualism and language contact. A subsequent and new component in the course is an introduction to and overview of lexicography, as both a practical and theoretical discipline. In linking the teaching of lexicography to students' prior learning in the course, coupled with the pedagogical principle of applying acquired knowledge, NG became the focus of a small-scale class project on the planning and compilation of a dictionary that offers Standard German (hereafter "SG") paraphrases of meaning for NG lexical items. The second author was responsible for the course, while the first author was invited to teach the lexicography component as a guest lecturer. While discussing lexicographic theory and overseeing the students' exercises in practical lexicography, the mutual idea emerged to expand the class project to an on-going, longer term dictionary project on a scientific basis. This requires that a proper dictionary plan be developed. The first aim of this article is to present a section of such a plan.

With regard to research, a new theory of lexicography is being developed, namely a communicative meta-lexicography referred to as the "theory of lexicographical communication", introduced by Beyer (2014). The second aim of this article is to frame the exposition of the partial dictionary plan in terms of this theory, thereby simultaneously working out the pertinent theoretical elements and developing the theory itself. This tandem approach serves to validate elements of the theory as they are developed.

In Section 2 the most salient variables of the context in which the proposed dictionary is being planned and would function are outlined. An overview of NG is provided, as well as a short survey of existing NG dictionaries, followed by a brief outline of the theoretical context and the applicable tenets of the theory of lexicographical communication. Section 3 links up with Section 2 by elaborating on the lexicographical considerations within the framework of the theory of lexicographical communication specifically pertaining to the proposed dictionary, focusing on the generative application of user questions to arrive at a basic microstructure, followed by an overview of what remains to be done to produce a complete dictionary plan and ensure successful lexicographical communication.

2. Context

2.1 Namibian German

The term *Namibian German* refers to a variety of German spoken by a minority language community in Namibia. Its origins are to be found in Namibia's past as a German colony from 1884 until 1915. NG is spoken by descendants of the German colonial settlers complemented by post-colonial Ger-

man immigrants. Their numbers rank between 12 000 and 20 000 (Maho, 1998, p. 14; Ammon, 2015, p. 362). Census statistics indicate that German was the main language spoken in 4 359 (0.9%) of 464 839 households in Namibia in 2011 (Namibia Statistics Agency, n.d., p. 68).

NG has traditionally been called *Südwesterdeutsch* – a term originating from *Deutsch Südwestafrika* – the name of the colony under German rule– which today still refers to NG spoken by the older generation. The designation *NamSlang* labels a variety of German used by young German Namibians in contemporary Namibia (cf. Zappen-Thomson, 2014, p. 10). This variety is celebrated and advertised as *NAM-Släng* by EES, a German Namibian singer who exaggerates its features in his music and gives the language a modern touch that resonates with the younger generation. Wiese, Simon, Zappen-Thomson & Schumann (2014, p. 275) study the linguistic features of NG and use the term *Namdeutsch* because of its relatively high frequency in colloquial NG. Shah (2007, p. 20) introduces the term *Namibisches Deutsch* in analogy to the names of other varieties and as a direct translation of the name *Namibian German*; the term *Namibia Deutsch* is also used.

From the earliest times, the territory known today as Namibia has been a multilingual environment. According to Maho (1998, pp. 147, 152), Bushman and Khoekhoe groups were present before any European involvement; the first Indo-European languages came after the establishment of the Cape Colony and the adoption of Cape Dutch by the Khoekhoe groups who migrated to the territory in the 18th and 19th century.

German came to the territory with German colonial rule, and it eventually became the colony's official language, which was also promoted as lingua franca since the colony was intended as a settler colony (Gretschel, 1995, p. 300). After Germany's defeat in World War I, the territory came under South African mandate with Dutch as official language, which changed to Afrikaans in 1925. Since then, Afrikaans assumed the function of lingua franca, which German ultimately never did (Gretschel, 1995, p. 300; Shah, 2007, p. 21). Despite the fact that German lost its status as official language, a German population remained, and later German was re-established in the school system (Gretschel, 1995, p. 301ff.; Esslinger, 2002, p. 491ff.), where it remains today.

With Namibia's independence in 1990, English became the official language (Constitution of the Republic of Namibia, n.d., Article 3), while German is recognised as one of the national languages. As such, it enjoys usage status in administration, education and broadcasting, and has an officially published orthography (Maho, 1998, p. 23). Today, German is offered in schools as a first language and as a foreign language. While learner numbers in German as a first language seem to be declining, they show positive growth in German as a foreign language. It is regarded as important to maintain

the German language as part of Namibia's heritage (cf. Esslinger, 2002, p. 504; Ammon, 2015, p. 363). Traces of this heritage can be observed all over the country in architecture, names of towns and streets (although some renaming has taken place), prominent cultural activities (such as the German *Karneval*), sport clubs (e.g. Sport Klub Windhoek (SKW) and the Deutscher Turn- und Sportverein (DTS)), as well as cultural and academic societies (e.g. the Wissenschaftliche Gesellschaft Namibia and the Arbeitsgemeinschaft Deutscher Schulen (AGDS)). German is also aired on national and local radio services, printed in the German daily *Allgemeine Zeitung* and used in everyday life in certain circles. Since German Namibians generally belong to the higher classes of the Namibian society, they are interested in and are able to support and maintain their language (cf. Ammon, 2015, p. 362).

As a result of language contact in multilingual Namibia, NG has been influenced by other languages, mainly the Indo-European languages of English and Afrikaans. This language contact produces code mixing, code switching and borrowing among German speaking Namibians, who usually speak German, English and Afrikaans fluently (Gretschel, 1995, p. 306). Inter- and transference lead to lexical and grammatical changes in the languages involved, including in NG. This has been viewed as enrichment (cf. Dahle & Leyerer, 1993, p. 290, cited in Gretschel, 1995, p. 306), but also as a "potential dangerous trend" due to its "uncontrolled Sprachmischung" (Gretschel, 1995, p. 306). According to Riehl (2014, p. 96), the most productive contact phenomena generally occur within the lexicon, syntax, morphology and phonology, which is also mostly the case in NG. While Riehl (2014, p. 115) indicates that besides a few differences, NG pronunciation is rather similar to standard northern German, there are more salient differences in the other grammar categories.

The following phenomena exemplify only some of the types of syntactic differences:

- Relative clauses: change from a verb final to a verb second order: *Hast du gehört, was <u>sagt</u> Claudia* (NG) < *Hast du gehört, was Claudia <u>sagt</u>* (SG)
- Negation: moving the negation particle *nicht* to directly after the V2 verb: *Du musst <u>nicht</u> das jetzt machen* (NG) < *Du musst das <u>nicht</u> jetzt machen* (SG)
- Pronominalisation of articles: *<u>Der</u> hat recht* (NG) < <u>Er</u> *hat recht* (SG)
- *um…zu* structures in attributive and object infinitives: *Ich habe keine Lust, <u>um</u> nass <u>zu</u> werden* (NG) < *Ich habe keine Lust, nass <u>zu</u> werden* (SG)

In terms of morphological differences, deviations from SG inflection patterns are observed, e.g. in *mit sein Auto* (NG) < *mit seinem Auto* (SG) among possessive pronouns (Shah, 2007, p. 28). See Shah (2007) for a detailed discussion of these and other grammatical phenomena in spoken NG. However, Wiese et al. (2014, p. 281) argue that some of the features that might be attributed to Afrikaans in-

fluence are also observable in spoken German in Germany; therefore, Afrikaans might in some instances merely support a particular existing feature.

The most productive area of influence is the lexicon, with borrowing (e.g. *biltong* <Afr., *huka* <Khoekhoegowab) (Maho, 1998, p. 170), compounding (e.g. *Nachternten* <Dutch/Afr.) (Riehl, 2014, p. 115) or complex expressions (e.g. *etwas bei der Versicherung claimen* <Eng.) (Riehl, 2014, p. 98) and lexico-grammatical transfer as a result of direct translation (*Es gibt viel Verkehr* (SG) > *Die Straße ist sehr beschäftigt* (NG) < *The street is very busy* (Eng.) / *Die straat is baie besig* (Afr.)) (cf.. Riehl, 2014, p. 25ff).

Wiese et al. (2014, p. 257ff, 277) apply a wider definition of the concept *dialect* (which labels German language islands as "German dialects abroad"), and considers NG as a dialect sharing features with Kiezdeutsch (a new urban dialect), despite their apparent different background and situation. However, following the traditional definition of *dialect* as confined to a small area and not functioning as a first or standard language, nor being in the process of standardisation (cf. Maho, 1998, p. 20), NG can be considered a variety. This is the view of the compilers of the *Variantenwörterbuch des Deutschen. Die Standardsprache in Österreich, der Schweiz, Deutschland, Liechtenstein, Luxemburg, Ostbelgien und Südtirol sowie Rumänien, Namibia und Mennonitensiedlungen* (Ammon, Bickel & Lenz, 2016 – hereafter "*Variantenwörterbuch*"), who for the first time include NG lexical items in the second edition. By virtue of their inclusion in the *Variantenwörterbuch*, these lexical items (such as *Rivier*, *Veld* and *Braai*) are declared "Namibismen", or elements of Standard Namibian German (hereafter "SNG"). The official recognition of "Namibismen" confirms that Namibian German is considered a variety of German (cf. Ammon, 2015, p. 369), which is a positive development in the light of arguments for such recognition in order to ensure a future for NG (cf. Gretschel, 2006).

2.2 Namibian German dictionaries

Apart from the inclusion of NG lexical items regarded as "Namibismen" in the latest edition of the *Variantenwörterbuch*, at least two dictionaries of NG that are more or less readily available in Namibia exist, i.e. *Das große Dickschenärie*. *Ein Wörkshopmänul für Südwester Deutsch* (Pütz, 1982 – hereafter "*Ein Wörkshopmänul*") and *Esisallesoreidt. NAM-Släng Diktschenärie* (EES, 2011 – hereafter, "*Esisallesoreidt*"). These are not scientific dictionaries, and they are evidently not intended to be such, as can be inferred merely from their (apparently self-parodical) titles: that of *Ein Wörkshopmänul* does not include the term *Wörterbuch* 'dictionary' but classifies the book as a 'workshop manual', while *Esisallesoreidt* is designated a "*Diktschenärie*" – an orthographic transcription of a

mimical NG pronunciation of the word *dictionary*. Compare the following dictionary articles: da_1 from *Ein Wörkshopmänul* (p. 49) and da_2 from *Esisallesoreidt* (p. 135):

da_1 noit: (Afr. "nooit" – nie, niemals) 1.wie Afr.

> Ein Oukie wird noit zu einem Stückie Biltong (Stück getrocknetes Fleisch) nein sagen.

da_2 **Pad** – (vom Afrik. "pad") Weg, Strasse, Autobahn.

> …man das alles is bei uns net ne' PAD!
>
> - Verschiede Pads sind: TeerPad, SandPad, OffroudPad, BuschPad & GräwelPad.
>
> (e.g.: Jerre wie krusd (fährt) der Ou vor uns, der is sicha lekka gezogen (dronk), check wie kommt der imma von der Pad ab!
>
> …oda…
>
> Wenn dich jemand kohlt (anruft), und nach frägt wo du bist, sach net: „..man chill Oukie, ich bin schon auf Pad, - bin gleich da, wach net...!")

From da_1 and da_2 it is clear that not all the prototypical characteristics associated with a dictionary seem to be represented. Although semantic data is offered, e.g. the entry "wie Afr.", indicating 'the same meaning as the meaning of the Afrikaans base word' in da_1 and "Weg, Strasse, Autobahn" in da_2, it is especially the additional data provided in a rather unconventional (i.e. amusing) and largely textually unstructured way that distinguishes these works from "real" dictionaries. However, this state of affairs should not lead to the conclusion that the above-mentioned titles cannot be regarded as dictionaries. The fact remains that they are reference works that primarily offer data on sets of lexical items that can be attributed to a particular lexicon, which is essentially no different from what a dictionary like the *Oxford Advanced Learner's Dictionary of Current English* (Hornby, 2015) is considered to be. Most of the observable anomalies are the result of the diverging target user groups and purposes of the relevant dictionaries, rather than their text-typological status.

The NG dictionary being planned and discussed in this article aims to serve a target user group and set of purposes that are at least partially distinct from those of the existing NG dictionaries, as will become clear in section 3.2.

2.3 Theoretical framework

The last four decades or so have seen the prolific development of theoretical lexicography. This initially occurred within a linguistic fold, introduced by Zgusta (1971; cf. Gouws & Prinsloo, 2005, p.

3f.), which has to some degree remained the status quo among those sections of the lexicographic fraternity who regard lexicography as a sub-discipline of applied linguistics (cf. e.g. Atkins & Rundell, 2008, p. 130; Fontenelle, 2011; De Schryver, 2012). They could loosely be referred to as members of the linguistics school of lexicography.

However, since the 1980s two meta-lexicographic paradigms that claim to be coherent and independent theories of lexicography have been advanced. They have established lexicography as an independent discipline in its own right, as opposed to lexicography as a sub-discipline of applied linguistics. (Cf. Gouws, Schweickard, & Wiegand, 2013, for a brief historical overview of lexicography)

The first theory is the so-called theory of lexicographic texts (generally referred to as "the text theory") developed within a general theory of lexicography primarily by H.E. Wiegand at the University of Heidelberg, Germany, which focuses on textual structures in dictionaries.[2] Although the text theory is constructed on an unassailable empirical foundation and seems to be a solid theory that has firmly established lexicography as an independent discipline and substantially expanded scientific meta-lexicographic nomenclature, it has been criticised for its perceived excessive complexity and esotericism by leading scholars like De Schryver (2012, pp. 494-495) and Rundell (2012, pp. 54-56). Particularly severe criticism has been levelled at the text theory by Bergenholtz and Tarp (2003) and Tarp (2008, pp. 28-39) for its perceived phenomenological character which, it is argued, deprives the theory of transformational capacity. It is exactly these perceived shortcomings that moved H. Bergenholtz and S. Tarp of the University of Aarhus, Denmark, to develop the second theory in response, i.e. the so-called modern theory of lexicographic functions (generally referred to as "the function theory").[3] This theory emphasises dictionary functions and the information needs of the target user group. Although it has made important contributions to theoretical lexicography, the function theory's status as a theory and aspects of its claim to originality have been questioned by scholars such as Piotrowski (2009, p. 485), Bogaards (2010, p. 316), Tono (2010, p. 3), De Schryver (2012, pp. 494-496) and Rundell (2012, pp. 58-61, 63). Lew (2008, pp. 119-120), Piotrowski (2009, p. 485) and De Schryver (2012, pp. 495-496) also criticise the theory's lack of an empirical basis. Rundell (2012, pp. 61-62) and Swanepoel (2015) criticise its proponents' rhetoric, and Swanepoel (2015) argues against a reductionist functionalistic approach to lexicography, concluding that the theory is in fact not a theory but rather a methodology. Most recently, an empirical evaluation by Ball and Bothma (2017) of an e-dictionary designed strictly along the lines of the function theory has shown

[2] For an overview, cf. Wiegand (1996) and Gouws, Heid, Schweickard, & Wiegand (2013).
[3] For an overview, cf. Bergenholtz & Tarp (2003) and Tarp (2013).

important shortcomings in the dictionary's usability, thereby seemingly challenging some of the theory's central arguments.

The theory of lexicographical communication being developed step by step at UNAM (hereafter "the communication theory") benefits conceptually from both theories mentioned above as much as it attempts to avoid their perceived weaknesses. The theory, which is still in its infancy, is based on two central tenets: (1) at its core, lexicography is an exercise in communication; and (2) this communication is indirect communication mediated by text. These very basic points of departure allow one to take a step back, as it were, and to adopt a holistic and eclectic approach. Apart from the existing body of a-theoretical and theoretical meta-lexicographic knowledge at the researcher's disposal, these tenets afford an opportunity to also tap into the potential of interpersonal communication theory, mass communication theory, media theory, psychology, document design, text linguistics, linguistic pragmatics and of course the other linguistic disciplines traditionally associated with lexicography, such as lexicology and sociolinguistics. The communication theory therefore recognises above all that meta-lexicography is an interdisciplinary field of enquiry.

2.4 The nature of lexicographical communication

The notion that lexicography is related to some form of interpersonal communication is not unique to the communication theory. According to Tarp (2008, p. 34), the function theory has at its origin "a simple model of communication". Yong and Peng (2007), which inspired the development of the communication theory beyond a framework for dictionary evaluation, approaches bilingual lexicography from a communicative perspective, although, according to Ptaszyński (2009, p. 213), this approach does not come to fruition, since "the theoretical model proposed by the authors does not follow from their empirical study".

Beyer (2006, 2014, pp. 38-63) explains in some detail how lexicography can be regarded as a type of interpersonal yet indirect communication by involving general and interpersonal communication theory, and linguistic pragmatics. This is currently the focus area of the communication theory. In addition, the fact that lexicographical communication primarily takes place indirectly through the medium of text, warrants text-directed research within frameworks like text linguistics and elements of the text theory. The issues that are pertinent to this article will be briefly outlined below.

Compare the following dictionary article (da_3) from the *Concise Oxford German Dictionary* (Clark & Thyen, 2005, p. 170):

da_3 erdrosseln *tr. V.* strangle

According to Wiegand and Gouws (2013, p. 273) da_3 can be described as "a text in a genuine lexicographic text format in which comments are made in a non-natural way," i.e. a "condensed dictionary article". If da_3 were uncondensed, i.e. presented in a natural way, it could have the form of da_4:

da_4 **Dictionary article on *erdrosseln***

> The word *erdrosseln* is spelt e-r-d-r-o-s-s-e-l-n. It is pronounced with primary stress on the vowel *o*. It is a transitive verb. Its meaning is represented in English by the word *strangle*.

Due to textual condensation, da_3 "lacks natural language syntactic relations" in comparison to da_4; therefore, certain structures that organise the presentation of the lexicographic data should be implemented "in order to ensure an organized recording of lexicographic information that can be learned by the user." (Wiegand & Gouws, 2013, p. 273)

Although the text is obviously of central importance in lexicographical communication, the communication theory does not take the text as point of departure, but rather the *lexicographic messages* that the lexicographer aims to transmit to the target user (cf. Beyer, 2014, p. 40ff). In the case of da_3 and da_4, the relevant lexicographic messages constitute set $LM_{da3,4}$:

$LM_{da3,4} = \{lm_1, lm_2, lm_3, lm_4\}$

lm_1 = The word *erdrosseln* is spelt e-r-d-r-o-s-s-e-l-n.

lm_2 = The word *erdrosseln* is pronounced with primary stress on the vowel *o*.

lm_3 = The word *erdrosseln* is a transitive verb.

lm_4 = The word *erdrosseln* is equivalent in meaning to the English word *strangle*.

The lexicographer decides in which textual utterances elements of sets like $LM_{da3,4}$ should be *encoded* for the target user, as co-determined by the dictionary purposes and medium. This implies that, in this sense, a condensed versus uncondensed version of a particular lexicographic text does not exist, but merely different sets of lexicographic utterances in which the same set of lexicographic messages would be encoded differently. Therefore, whereas the text theory would regard da_3 as a condensed version of a full text da_4 (cf. Wiegand, 1996a, p. 137), the communication theory would regard da_3 and da_4 as distinctly independent lexicographic texts that happen to encode the same set of lexicographic messages ($LM_{da3,4}$) according to the respective dictionary's lexicographical code.[4]

[4] This point could be argued further in terms of communication theory and text linguistics, but due to space considerations the argument will be limited to these remarks. The communication theory recognises textual condensation as a more limited (natural language) textual strategy, e.g. abbreviating the word *transitive* to *tr.* in da_3 – cf. Beyer (2014).

The lexicographic utterances in da_3 conform to a specific lexicographical code in the same way that the utterances in da_4 (in the form of sentences in a coherent paragraph) conform to the grammatical and textual structures (i.e. the linguistic code) of a natural language like English.

A dictionary's lexicographical code determines the form of lexicographic utterances and in what way they are organised in a uniform and consistent way across dictionary articles in order for the target user to learn the code and become a "knowledgeable user who is familiar with the system of the dictionary" and who should therefore "be able to predict which data types can be found in a given article and also where to find a specific data type" (Gouws & Prinsloo, 2005, p. 273). These aspects pertain directly to the microstructure of a dictionary, which will be applied to the planned NG dictionary in section 3.3 below.

A final point to be made with regard to the nature of lexicographical communication is that it is more or less static, because it occurs almost exclusively through the relatively static medium of text.[5] The implications of this property will become relevant in section 3.4.

3. A new Namibian German dictionary

This section focuses on the planned new NG dictionary (hereafter "the NGD").

3.1 Dictionary purposes and target users

3.1.1 Dictionary purposes

Both the text theory and the function theory employ the concept of *genuine purpose* to describe the intended purpose(s) of a dictionary. However, the two theories, which Bergenholtz and Tarp (2003) regard as incompatible paradigms, assign seemingly opposing denotations to the term (cf. Tarp, 2008, pp. 88-97), which has the unfortunate effect of making it theoretically ambiguous and therefore less useful generally. This issue will not be elaborated here. However, for this reason, among others, the communication theory has adopted and adapted a different approach in conceptualising the purposes of a dictionary, namely a contextual approach used by Siebörger and Adendorff (2015, p. 176-178) to describe communication in the South African parliament. The result is a classification of three types of dictionary purposes, introduced below.

The first class of purposes is the *macro-contextual purposes*, which refer to the general socio-cultural contribution(s) that the dictionary would make in the broader society in which it functions. Examples of macro-contextual purposes could be to document the lexical stock of a language, to assist in

[5] The degree to which text is a static medium is undoubtedly debatable in the modern era; however, in comparison to direct interpersonal communication, and particularly in terms of lexicographical communication, a significant difference could be postulated (with the possible exception of crowd-sourced e-dictionaries).

standardising a language and to assist in language learning and teaching. Macro-contextual purposes could also be symbolic or ideological in nature, e.g. to improve the status of a language, or even to serve as "a guardian of the purity of the language, of language standards and of moral and ideological values" (Van Sterkenburg, 2003, p. 8). At this level Yong and Peng (2007, p. 3) distinguish "three kinds of function: descriptive, didactic and ideological".

The second class of dictionary purposes is the *meso-contextual purposes*. These are a dictionary's purpose(s) pertaining to the user situation, i.e. the situation in which the target user experiences specific information needs that result in user questions and user consultation objectives (cf. Beyer, 2014, pp. 38-40). In the function theory, these purposes are referred to as dictionary functions.[6] Several types of dictionary functions are distinguished, e.g. communication-oriented functions, which include the functions of text reception, text production and translation (Tarp, 2008, p. 43ff). The meso-contextual purpose of a dictionary can therefore be described as the user situation for which it is designed, e.g. the situation of writing a text (as opposed to reading one). Meso-contextual purposes can also be referred to as *user situation purposes*, or, following the function theory, *dictionary functions*.

The third class of dictionary purposes is the *micro-contextual purposes*. These are a dictionary's purpose(s) pertaining to the usage situation, i.e. the immediate situation in which the target user is in the process of consulting a dictionary in order to achieve a user consultation objective, which is usually to find an answer to a user question (cf. section 3.2). The micro-contextual purpose of a dictionary can therefore be described as to produce accessible and decodable lexicographic messages (i.e. data) in answer to a set of user questions as they arise in a particular user situation. Most of the dictionary structures described in the text theory address the dictionary's micro-contextual purposes, which could also be referred to as *immediate purposes* or *usage situation purposes*.[7] An example of a micro-contextual purpose is: To provide the spelling of a lemma x_i in response to the potential target user question: "What is the spelling of word x_i?"

It is clear that there should be a direct relation of implication between a dictionary's meso-contextual purposes and its micro-contextual purposes. It would seem that macro-contextual purposes can stand in different relations to the other two types of purposes (which could inform a possible subclassification), but this aspect will not be developed further here.

[6] This seems to be related to the denotation assigned to the term *genuine purpose* by the function theory (cf. Tarp, 2008, pp. 88-97).
[7] This seems to be related to the denotation assigned to the term *genuine purpose* by the text theory (cf. Tarp, 2008, pp. 88-97).

The relative domains of the three types of dictionary purposes can be depicted in the form of a basic target diagram in figure 1 below:

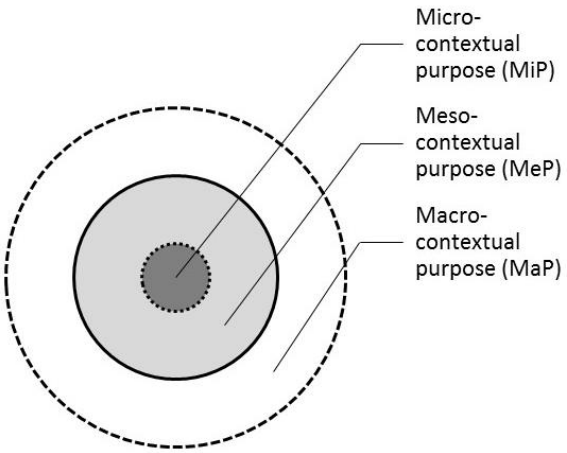

Figure 1: A basic target diagram indicating the relative domains of the micro-contextual (usage) purpose, meso-contextual (user situation) purpose and macro-contextual purpose of a dictionary

For the NGD the following set of macro-contextual purposes (MaP_{NGD}) is identified:

MaP_{NGD} = {MaP_1, MaP_2, MaP_3}

MaP_1 = To contribute to successful communication between speakers of SG and speakers of NG

MaP_2 = To contribute to a general understanding of NG as an element of Namibia's multilingual context

MaP_3 = To document lexical elements of NG as a variety of German in an accessible, professional lexicographic work

MaP_1 and MaP_2 have a direct influence on MeP_1 and MeP_2 as elements of the set of meso-contextual purposes (MeP_{NGD}) identified for the NGD, formulated below in a typical outcomes-focused style:

MeP_{NGD} = {MeP_1, MeP_2}

MeP_1 = The target user comprehends utterances containing NG lexical elements. (<MaP_1)

MeP_2 = The target user understands facts about NG. (<MaP_2)

From MeP_{NGD} it should be inferred that the NGD is not being designed to assist the target user with writing in or speaking NG, but merely for the user to comprehend (spoken and written) NG and to acquire some basic background knowledge about NG.

The set of micro-contextual purposes (MiP_{NGD}) can be equated to the relevant set of user questions and the lexicographic messages answering them. This is the focus of section 3.2.

3.1.2 Target users of the NGD

The target user group is characterised as mother-tongue speakers of SG who are typically fully literate secondary school graduates. The group possesses a good reading and reference culture, and is therefore familiar with dictionary use. Generally, but not exclusively, the target user group consists of German-speaking tourists.

3.2 User questions

3.2.1 The meta-lexicographical concept *user question*

In his theoretical framework for dictionary user research, Wiegand (1987, p. 203ff.) introduces the concept of the *search question*, with which the dictionary user approaches a dictionary in a non-verbal questioning act. A dictionary consultation procedure can be regarded as unsuccessful if the user does not find an answer to their search question in the dictionary. This notion is particularly suited to a communicative meta-lexicography that views lexicography as part of a special type of interpersonal communication. Beyer and Faul (2010, pp. 653-654) use this approach indirectly in a survey to determine university entrants' understanding of the concept *dictionary*, while Bae and Nesi (2014) and Holdt, Čibej and Vitez (2017) study language-related questions and comments in digital media in their lexicographic user research.

The communication theory uses the related term *user question*, and distinguishes between three types of user questions, namely *raw user questions*, *user situation questions* and *potential user situation questions* (cf. Beyer, 2014, pp. 56, 70-71). *Raw user questions* refer to user questions as directly recorded during empirical user research, based on the *principle of expressibility*, introduced by Searle (1969, p. 19) in speech act theory, which states that "whatever can be meant can be said." An example of a set of raw user questions ($Q_U n$) is the following:

$Q_U n = \{Q_U 1, Q_U 2, Q_U 3, Q_U 4\}$

$Q_U 1$ = What is the meaning of the word *sin*?

$Q_U 2$ = Does the word *sin* mean 'to break God's law'?

$Q_U 3$ = Does the word *sin* only mean 'to break God's law'?

$Q_U 4$ = Does the word *sin* mean 'to break God's law' or 'to do the wrong thing'?

The raw user questions in set $Q_U n$ can be distilled to a single representative *user situation question* (SQ_U):

SQ_U = What is the meaning of the word *sin*?

Following Searle (1969, pp. 31-32), SQ_U can also be expressed as an illocution in the form of "?(p)", which reads "QUESTION(propositional function p)". Since SQ_U is a wh-question, it is represented as follows:

SQ_U = ?(The meaning of the word *sin* is …)

The ellipsis represents the information that is requested. In contrast, a polar (yes-no) question, where the truth of a full proposition is questioned, e.g. "Is the word *sin* a word in English?" would be represented as follows:

SQ_{pq} = ?(The word *sin* is a word in English.)

If SQ_U is lexicographically relevant, it can be generalised to the following *potential user situation question* ($p.SQ_U$):

$p.SQ_U$ = ?(The meaning of lexical item *x* is …)

The implication for a dictionary that aims to answer this type of user situation question is obvious: For every lexical item *x* that is lemmatised, specify the meaning of *x*. A set of potential user situation questions should determine which lexicographic messages should be encoded in the dictionary. This is shown in the following section, where the focus returns to the NGD.

3.2.2 Potential user situation questions for the NGD

By employing scientifically recognised data gathering methods and instruments[8], the following set of potential user situation questions (in random order) directed at the NGD ($p.SQ_{U/NGD}$) could be developed:

$p.SQ_{U/NGD}$ = {$p.SQ_U1$, $p.SQ_U2$ .. $p.SQ_U10$}

$p.SQ_U1$ = ?(The meaning of NG lexical item li_1 is …)

$p.SQ_U2$ = ?(Lexical item li_1 is an element of NG.)

$p.SQ_U3$ = ?(NG lexical item li_1 is pronounced as …)

$p.SQ_U4$ = ?(The meaning of NG syntagma syn_1 containing NG item li_1 is …)

$p.SQ_U5$ = ?(NG lexical item li_1 is borrowed from source language …)

$p.SQ_U6$ = ?(The source language base lexical item of NG lexical item li_1 is …)

[8] E.g. focus group discussions or think-aloud protocols applied in real or simulated dictionary usage situations, and pre-, during and/or post-usage situation questionnaires.

$p.SQ_U7$ = ?(The source language meaning of the source language lexical item li_2 from which NG item li_1 originates, is …)

$p.SQ_U8$ = ?(NG lexical item li_1 is recognised as an element of SNG.)

$p.SQ_U9$ = ?(NG is …)

$p.SQ_U10$ = ?(NG originated from …)

Considering a data distribution and frame structure (cf. Gouws & Prinsloo, 2005, pp. 57-65) for the NGD, the lexicographic messages providing answers to $p.SQ_U9$ and $p.SQ_U10$ would be optimally accommodated in outer (front or back matter) texts in the form of prose similar to that in section 2.1. Since this article deals with the development of a microstructure as an element of the central text of the NGD, these two questions are not of immediate relevance and are therefore excluded from the rest of the discussion.

In the development of the NGD microstructure to answer $p.SQ_U1$ to $p.SQ_U8$, the potential user situation questions will be represented formally by means of elementary expressions in predicate calculus. The advantage of this approach is that all terms are uniquely denoted in formulas which simultaneously represent the relevant questions, user consultation objectives and lexicographic messages that would answer the questions. This aids in generalising and demonstrating coherence in the theory. The utilisation of predicate calculus also facilitates the development of a context-free grammar that can express the syntagmatic axis of a lexicographical code (to complement the second dimension, i.e. the paradigmatic axis – cf. Chandler, 2007, p. 83ff.; De Saussure, 2013, pp. 144-148).[9] The underlying implication is that a communication theory of a particular dictionary and ultimately a more general communication theory of lexicography would work with a finite set of formulas representing a finite albeit open set of lexicographic messages, even if they are encoded in diverging lexicographic utterances (e.g. da_3 vis-à-vis da_4). The formulas are employed primarily for purposes of formalisation, but could also be used to develop logical proofs where necessary. The rest of this section will follow the conventions and procedures of predicate calculus as described by Hodges (2001, pp. 176-202) and Lee (2017, pp. 263-299), the only deviation being that many predicates and terms are represented by multi-letter symbols instead of single letters due to their number. This also requires an adapted punctuation system. Natural language equivalents will be provided after each formula where it is stated for the first time.

[9] The text theory, in comparison, develops a textual code of lexicography.

Firstly, it is necessary to define the formal language that will be used and to delimit the sphere of its application, referred to as its *discourse universe*. The language is designated as L_{NGD} and is defined as follows:

L_{NGD} = {Q, S, T, O, R}

Q = {q_1, q_2}

S = {s_1, s_2 .. s_n}

T = {t_1, t_2 .. t_n}

O = {o_1, o_2 .. o_n}

R = {r_1, r_2}

The elements of sets S, T and O presented below are limited to those that are relevant for the purposes of this article; therefore, they constitute proper subsets of S, T and O respectively.

Predicate calculus quantifiers

q_1 Let $\forall x$ = For every *x* it is the case that …

q_2 Let $\exists x$ = There exists at least one *x* such that …

Predicate definitions

s_1 Let (*x* = *y*) = *x* is logically identical to *y*.

s_2 Let *Ŝ*(*x*) = *x* is sought. (consultation objective) (meta-comment)

s_3 Let ⊦(*x*) = *x* is stated. (meta-comment)

s_4 Let *ART*(*x*, *y*) = *x* takes the definite article *y*.

s_5 Let *BLI*(*x*, *y*) = *x* has the base lexical item *y*.

s_6 Let *BRW*(*x*, *y*) = *x* is borrowed from source language *y*.

s_7 Let *EQV*(*w*, *x*, *y*, *z*) = *w* is equivalent to *x* with regard to *y* and *z*.

s_8 Let *EXP*(*x*, *y*) = *x* expresses *y*.

s_9 Let *FON*(*x*, *y*) = *x* has the phonological form *y*.

s_{10} Let *LU*(*x*, *y*) = *x* is encoded in lexicographic utterance *y*. (meta-comment)

s_{11} Let *NG*(*x*) = *x* is an element of NG.

s_{12} Let *SG*(*x*) = *x* is an element of SG.

s_{13} Let *SLC*(*x*, *y*) = *x* is socio-linguistically classified as an element of *y*.

s_{14} Let *SP*(*x*, *y*) = *x* has the orthographic form (spelling) *y*.

s_{15} Let *SYN*(*x*, *y*) = *x* is an element of syntagma *y*.

s_{16} Let *TOP*(*x*) = *x* is the topic.

Term definitions

Constants

t_1 Let *ng* = NG

t_2 Let *sng* = SNG

Individual variables

Immaterial (i.e. lexicographically non-expressed) individual variables are represented by Greek alphabet symbols.

t_3 Let e_x = NG expression *x*

t_4 Let fon_x = expression *x* of phonological form

t_5 Let li_x = lexical item *x*

t_6 Let ls_x = lemma sign *x*

t_7 Let sem_x = paraphrase of meaning *x*

t_8 Let sl_x = source language name *x*

t_9 Let syn_x = syntagma *x*

t_{10} Let ϕ_x = phonological form *x*

t_{11} Let σ_x = semantic value *x*

t_{12} Let π_x = pragmatic value *x*

Truth-functional connectives

o_1 Let *x* ^ *y* = conjunction: *x* and *y*

o_2 Let *x* v *y* = disjunction: *x* or *y*

o_3 Let ¬*x* = negation: not *x*

o_4 Let *x* → *y* = material implication: *x* implies *y* (if *x*, then *y*).

o_5 Let $x \leftrightarrow y$ = material equivalence: *x* is logically equivalent to *y* (if and only if *x*, then *y*, and the converse).

Punctuation

r_1 Square brackets delimit the scope of the preceding quantifier(s).

r_2 Commas separate terms.

The discourse universe of L_{NGD} is limited to the NGD; all expressions in L_{NGD} relate to and are limited to the NGD.

For the discourse universe of the NGD, the following series P of propositional functions applies universally:

$P = \langle p_1, p_2, p_3, p_4, p_5, p_6, p_7, p_8, p_9 \rangle$

p_1 $\forall e\ [NG(e)]$

(Every expression *e* is an element of NG. = All expressions *e* are NG expressions.)

p_2 $\forall ls\ \exists e_x\ [\vdash(ls) \rightarrow (\vdash(e_x)]$

(The statement of every lemma sign *ls* implies the statement of some expression e_x.)

p_3 $\forall syn\ \exists e_x\ [\vdash(syn) \rightarrow \vdash(e_x)]$

(The statement of every syntagma *syn* implies the statement of some expression e_x.)

p_4 $\forall ls\ \exists li_x\ [(\vdash(ls) \rightarrow \vdash(li_x)) \rightarrow (ls = li_x)]$

(The statement of every lemma sign *ls* implies a statement of some lexical item li_x; therefore, every lemma sign *ls* is logically identical to some lexical item li_x. = Every lemma sign *ls* lemmatises some lexical item li_x; therefore, every lemma sign *ls* is interchangeable with some lexical item li_x.)

p_5 $\forall fon\ \exists \phi_x\ [EXP(fon, \phi_x) \rightarrow (fon = \phi_x)]$

(Every expression of a phonological form *fon* expresses some phonological form ϕ_x; therefore, the expression *fon* is logically identical to some phonological form ϕ_x. = The pronunciation ϕ_x of some expression *e* is represented by an expression fon_x; therefore, every expression *fon* is interchangeable with some pronunciation ϕ_x.)

p_6 $\forall e\ \exists \sigma_x, \pi_x\ [EXP(e, \sigma_x) \wedge EXP(e, \pi_x)]$

(Every NG expression *e* expresses some semantic value σ and some pragmatic value π.)

p_7 $\forall sem\ [SG(sem)]$

(Every paraphrase of meaning *sem* is an element of SG. = Every paraphrase of meaning *sem* is given in SG.)

p_8 $\forall sem\ \exists \sigma_x, \pi_x\ [EXP(sem, \sigma_x) \wedge EXP(sem, \pi_x)]$

(Every SG paraphrase of meaning *sem* expresses some semantic value σ and some pragmatic value π.)

p_9 $\exists e_1, sem_1, \sigma_1, \pi_1\ [EXP(e_1, \sigma_1) \wedge EXP(e_1, \pi_1) \wedge EXP(sem_1, \sigma_1) \wedge EXP(sem_1, \pi_1) \leftrightarrow EQV(e_1, sem_1, \sigma_1, \pi_1)]$

(If and only if some NG expression e_1 expresses some semantic value σ_1 and some pragmatic value π_1, and some paraphrase of meaning sem_1 expresses some semantic value σ_1 and some pragmatic value π_1, then NG expression e_1 is equivalent to paraphrase of meaning sem_1 in relation to σ_1 and π_1. = If and only if some NG expression e_1 and some paraphrase of meaning sem_1 expresses the same semantic and pragmatic values, they are semantic-pragmatically equivalent. = Expression e_1 has the same meaning as sem_1, and vice versa.)[10]

In terms of pragmatics, P can be regarded as a set of presuppositions co-constituting the discourse common ground (cf. Fetze, 2012, pp. 465-467; Huang, 2014, pp. 16-17[11]) that exists between the lexicographer and the target user at the moment when the target user enters the usage situation. As such, P represents the diagnostic characteristics of the relevant dictionary (type) that moves the target user to select it from other available dictionaries to answer a particular user question: the NGD lemmatises NG lexical items and states the meanings of these lexical items in SG; it is a bilectal, monoscopal, NG-SG dictionary. In lexicographical communication, P could therefore be regarded as the core terms of an agreement between the lexicographer and the target user pertaining to the NGD.

Next, each potential user question will be treated individually in four steps:

Step 1: The question will be restated from $p.SQ_{U/NGD}$.

Step 2: The propositional function of the question will be expressed in predicate calculus, formalising its information structure while simultaneously framing the lexicographic message that would constitute an answer to the question. In the case of a wh-question, the argument in the subject position is the topic, whilst the argument in the object position, is the *new information* in or *focus* of the lexicographic message (following Lambrecht, 1994, p. 206ff. and Gundel, 2012, pp. 589-591).

[10] Formula p_9 expresses only the relation of full equivalence (cf. Gouws & Prinsloo, 2005) for demonstration purposes. Other equivalent relations will not be dealt with in this article.

[11] A problematisation of the notion of *common ground* falls beyond the scope of this article; however, cf. Nemo (2007).

Step 3: Based on the formula generated in step 2, the potential user consultation objective (p.CO) will be identified in terms of the relation between the lexicographic message and the lexicographic utterance (LU) in which the lexicographic message would be encoded. Although this step is also expressed by means of predicate calculus, it should be regarded as a meta-comment on the product of step 2.

Step 4: Where necessary, additional lexicographic messages will be formulated to express presuppositions and change in topic, and additional specifications will be formulated.

Steps 1 to 3 will be indicated in the analysis of the first question below. Step 4 will follow after all eight questions have been formalised.

Step 1

$p.SQ_U1$ = ?(The meaning of NG item li_1 is …)

Step 2

$A = \exists ls_1, sem_1 [EQV(ls_1, sem_1, \sigma_1, \pi_1)]$

Step 3

$p.CO_1 = \exists LU_A [\$(A) \rightarrow \$(LU_A)]$

(If *A* is sought, then LU_A is sought. = The p.CO is LU_A, in which *A* is encoded.)

$p.SQ_U2$ = ?(Lexical item li_1 is an element of NG.)

$B = \exists ls_1 [NG(ls_1)]$

$p.CO_2 = \exists LU_B [\$(B) \rightarrow \$(LU_B)]$

$p.SQ_U3$ = ?(NG lexical item li_1 is pronounced as …)

$C = \exists ls_1, fon_1 [FON(ls_1, fon_1)]$

$p.CO_3 = \exists fon_1 [\vdash(C) \rightarrow \$(fon_1)]$

$p.SQ_U4$ = ?(The meaning of NG syntagma syn_1 is …)

$D = \exists syn_1, sem_2, \sigma_1, \pi_1 [EQV(syn_1, sem_2, \sigma_1, \pi_1)]$

$p.CO_4 = \exists LU_D [\$(D) \rightarrow \$(LU_D)]$

$p.SQ_U5$ = ?(NG lexical item li_1 is borrowed from source language …)

$E = \exists ls_1, sl_1 [BRW(ls_1, sl_1)]$

$p.CO_5 = \exists LU_E [\$(E) \rightarrow \$(LU_E)]$

$p.SQ_U6$ = ?(The source language base lexical item of NG lexical item li_1 is …)

$F = \exists ls_1, li_2 [BLI(ls_1, li_2)]$

$p.CO_6 = \exists LU_F [\$(F) \rightarrow \$(LU_F)]$

$p.SQ_U7$ = ?(The source language meaning of the source language lexical item li_2 from which NG item li_1 originates, is …)

$G = \exists li_2, sem_3, \sigma_1, \pi_1 [(EQV(li_2, sem_3, \sigma_1, \pi_1)]$

$p.CO_7 = \exists LU_G [\$(G) \rightarrow \$(LU_G)]$

$p.SQ_U8$ = ?(NG lexical item li_1 is an element of SNG.)

$H = \exists ls_1 [SNG(ls_1)]$

$p.CO_8 = \exists LU_H [\$(H) \rightarrow \$(LU_H)]$

In the case of $p.CO_2$ and $p.CO_8$, which are derived from polar questions, it is not the value of a particular term in *B* and *H* respectively that is sought. Rather, what is sought is whether the eventual propositions *B* and *H* respectively are true. This demonstrates the importance of step 3 in the process. The reason for the diverging expression of $p.CO_2$ and $p.CO_8$ will become clear in the next section.

Step 4

Lexicographic message *D* (answering $p.SQ_U4$) presupposes that a syntagma (syn_1) exists and that the lemma sign (ls_1) is an element of it. This presupposition is expressed in D_1:

$D_1 = \exists ls_1, syn_1 [SYN(ls_1, syn_1)]$

After D_1 is stated, the topic becomes syntagma syn_1, as can be derived from the information structure of *D*. The value of syn_1 would be a NG syntagma containing ls_1, but whose meaning would still be unclear to the target user even if they learnt the meaning of ls_1 as provided by lexicographic message *A*. These syntagmata would mostly be collocations with ls_1 that constitute non-idiomatic expressions in SG. For example, the meaning of the syntagma *das Rivier läuft* 'the river is running' could still be unclear to the target user although they understand the meaning of the NG lexical item *Rivier* (SG *Fluss*), because the syntagma ?*der Fluss läuft* is a non-idiomatic expression in SG. The *Leipzig Corpora Collection* (1998-2017) contains a NG "newspaper corpus based on material crawled in 2012", consisting of over 10 million words written in about 600 000 sentences in NG (cf. Goldhahn,

Eckart, & Quasthoff, 2012). An online query of the token *Rivier* reveals 311 hits and a significant co-occurrence with the following relevant tokens to either its immediate left (L) or right (R): *laufende* (62xL), *laufendes* (49xL), *fließende* (42xL), *läuft* (56xR), *lief* (52xR) and *gelaufen* (29xR). From these statistics, it is clear that *Rivier* collocates with various inflections and derivatives of *laufen*; therefore, a representative syn_1 like *das Rivier läuft* would be included in the dictionary article of the lemma **Rivier**, together with semantic paraphrases in SG (sem_2). [12]

With regard to the lemma sign, ls_1 encodes the lexicographic message that the lemma sign (and therefore the represented lexical item) is the topic (of the dictionary article):

$I = \exists ls_1 [TOP(ls_1)]$

In order for an argument to become a topic, it must either be announced as a topic (as in *I*), or move from the object position in a previous propositional function to the subject position of a new one (as from D_1 to *D*).

3.3 A basic microstructure

Gouws and Prinsloo (2005, p. 64) define the term *microstructure* as "the selection of data categories given as part of the treatment of the lemma sign". In strictly communicative terms, the microstructure could be described as the set of lexicographic messages dealing with a particular lemma sign in a dictionary article. A *basic microstructure* could be characterised as a microstructure that contains only that set of lexicographic messages that answer the identified potential user situation questions directed at the dictionary. This implies two things: (1) a basic microstructure constitutes a subset of a complete microstructure; and (2) a microstructure can contain lexicographic messages in addition to those that answer the identified potential user situation questions (in which case it could be referred to as an *amplified microstructure*.)

A basic microstructure for the NGD would therefore consist of the set of lexicographic messages BM_{NGD}:

$BM_{NGD} = \{A, B, C, D, D_1, E, F, G, H, I\}$

As with any text that conforms to the norms of textuality, the lexicographic messages cannot be presented in any order, but they should be organised to create a coherent dictionary article, primarily according to their information structure. Based on the tradition of lexicographic text structures, the following linear order could be proposed, presented as a series, thus:

[12] The modifier *representative* implies that the target user, as a mother-tongue speaker of German, should be able to infer the relevant inflections and derivatives from the given form: *läuft* (given form) → *laufen* (verb infinitive) → *laufend* (predicate adjective) → *laufendes* (attributive adjective).

$BM_{NGD} = \langle I, B, H, C, E, F, G, A, D_1, D \rangle$

Each lexicographic message has to be encoded in at least one lexicographic utterance (LU). Since a dictionary is a reference work and should therefore be designed for ease of access and information retrieval, the lexicographic tradition of limiting the parameters of LUs (locutions) to the p.COs will generally be applied to the NGD. This approach also conforms to the second maxim under the Quantity category of the Cooperative Principle in the theory of conversational implicature, which states: "Do not make your contribution more informative than is required" (Grice, 1991, p. 26). Hence, the parameters of the series of LUs for the NGD (LU_{NGD}) can be specified in the form of Table 1 below:

$LU_{NGD} = \langle LU_I, LU_B, LU_H, LU_C, LU_E, LU_F, LU_G, LU_A, LU_{D1}, LU_D \rangle$

Table 1: LU parameters for LU_{NGD}

Lexicographic message	**LU parameter**	**LU index**
I	ls_1	LU_I
B	ls_1	LU_B
H	None	LU_H
C	fon_1	LU_C
E	sl_1	LU_E
F	li_1	LU_F
G	sem_3	LU_G
A	sem_1	LU_A
D_1	syn_1	LU_{D1}
D	sem_2	LU_D

From the above it becomes clear that LU_I and LU_B are limited to the same focus term (ls_1), yet obviously encode different lexicographic messages (i.e. *I* and *B* respectively). This means that these two lexicographic messages could be encoded in a single, two times polysemic $LU_{I \wedge B}$.

The encoding of lexicographic messages *B* and *H* require further clarification, because they both respond to polar questions, yet are encoded differently in LU_B and LU_H respectively, as the diverging LU parameters in Table 1 show.

With regard to LU_B, it is sufficient to state ls_1 in order to state *B*, based on presuppositions p_1 and p_2, as is shown by the following simple proof:

1. $\forall e\ [NG(e)]$ P (= p_1)

2. $\forall ls\ \exists e_x\ [\vdash(ls) \rightarrow (\vdash(e_x)]$ P (= p_2)

3. $\therefore\ \exists ls_1\ [\vdash(ls_1) \rightarrow NG(ls_1)]$ 1,2 MP

However, ¬(⊦(ls_1)) does not imply that ¬(*NG*(ls_1)), since in that case ls_1 is not an element of the NGD and therefore not an element of the discourse universe of the NGD, in which case the NGD does not comment on (the status of) ls_1.

With regard to LU_H the situation is slightly different, since the lexicographic message must be either *H* or ¬*H*, because both *H* and ¬*H* fall within the discourse universe of the NGD. In this case propositional calculus (cf. Hodges, 2001, pp. 97-120; Lee, 2017, pp. 173-261) can be fully applied:

$H \rightarrow LU_H$

$\therefore \neg LU_H \rightarrow \neg H$ MT

LU_H will therefore be presented only when it is true that *H*. In its absence, it is true that ¬*H*. For this reason, LU_H is not limited to any parameters in terms of the information structure of *H* and can assume an arbitrary form, e.g. "*", or "N" as a condensed form of "Namibismus".

Exactly what forms the respective LUs will assume, will raise questions like the following: Should fon_1 be given as an IPA, X-SAMPA or orthographic transcription? Should sl_1 be given in the full form (e.g. "Afrikaans") or in a condensed form (e.g. "Afr.")? Should sem_1 be given in the form of a lexicographic definition or a SG translation equivalent, or both? These questions fall beyond the scope of this article and will therefore not be dealt with here. In the interest of demonstrating the output of a dictionary article in terms of this microstructural theory, they will be bypassed and the example below will assume certain answers.

An annotated vertical microstructure that would represent this theory with regards to a dictionary article da_5 (**Rivier**) can be presented in Table 2.

Table 2: Annotated vertical basic microstructure of da_5 (**Rivier**)

Lexicographic message(s)	**LU parameter**	**LU index**	**LU value for da_5**
I ^ *B*	ls_1	$LU_{I \wedge B}$	Rivier
H	None	LU_H	N
C	fon_1	LU_C	Rə'viə[13]
E	sl_1	LU_E	Afr.
F	li_1	LU_F	Rivier
G	sem_3	LU_G	=[14]
A	sem_1	LU_A	Fluss
D_1	syn_1	LU_{D1}	Das Rivier läuft.
D	sem_2	LU_D	Der Fluss führt Wasser.

[13] IPA transcription

[14] "=" reads 'the same semantic value(s) than the one(s) that follow(s)': $G \wedge (\exists sem_3, sem_1 [sem_3 = sem_1])$

Table 2 clearly demonstrates the polysemic nature of $LU_{I\wedge B}$, which encapsulates lexicographic messages *I* and *B*. An unannotated horizontal version of the series LU_{NGD} results in the basic microstructure bm_{da5} of the incomplete dictionary article da_5:

bm_{da5} Rivier N Rə'viə Afr. rivier = Fluss Das Rivier läuft. Der Fluss führt Wasser.

3.4 To do: optimise lexicographical communication

From bm_{da5} an eventual final dictionary article da_5 can be developed, which could have the following form if no lexicographic messages are added to the basic microstructure:

da_5 **Rivier**^{N} [Rə'viə] ⟨<Afr. *rivier*, =⟩ Fluss • *Das Rivier* ***läuft***. Der Fluss führt Wasser.

This product implies decisions with regard to the search area structure (i.e. the application of typographical and non-typographical structural markers), the type of microstructure and the article structure of the NGD (cf. Gouws, 2003; Gouws & Prinsloo, 2005, pp. 63-64), all of which fall beyond the scope of this article. (For example, in da_5, the non-typographical structural marker "•" encodes the lexicographic message that a NG collocation and its SG paraphrase of meaning follow.)

Given the relative static nature of the lexicographic text, the lexicographer might add lexicographic messages that constitute advisements (as opposed to statements in response to user questions) considered to be additional information for the target user in the user and/or usage situation. These additional lexicographic messages could be motivated against the background of methods and traditions in linguistic documentation, therefore supporting the NGD's macro-contextual purpose MaP_3. They could be encoded in LUs like part-of-speech indicators, lexicographic labels and context entries, and their positioning will depend on lexicographic coherence as established by the structures mentioned above. As a consequence, the microstructure will develop beyond the limits of a basic microstructure. For example, concrete lexicographic messages *J* and *K* could be added with regard to da_5:

J = *ART*(Rivier, das)

K = *SP*(Rivier, ⟨R, i, v, i, e, r⟩)

This could result in da_{5a}:

da_{5a} **Rivier** *das*, <*N*> [Rə'viə] ⟨<Afr. *rivier*, =⟩ der Fluss • *Das Rivier* ***läuft***. Der Fluss führt Wasser.

Note how the inclusion of LU_J ("das") has influenced the position of LU_H ("N"). Lexicographic message *K* is encoded in the existing $LU_{I\wedge B}$ (the lemma sign "**Rivier**"), thereby adding another polysemic value, yielding the three times polysemic $LU_{I\wedge B\wedge K}$. The semantic paraphrase *Fluss* has also been extended to include the article *der*.

4. Future research

With regard to the completion of the dictionary plan for the NGD, the structures mentioned in section 3.4 should be defined and designed, and any advising lexicographic messages should be identified and incorporated in an amplified microstructure. A lemmatisation policy should be developed, and since NG is a mostly spoken variety, the orthography of lemma candidates should be determined and systematised. Many variables will be affected by the medium that is ultimately chosen for the NGD. For example, if the NGD is designed as an e-dictionary, the pronunciation of lemmata could be given by means of sound recordings instead of phonetic transcriptions. It would also be necessary to build a corpus of spoken NG that could complement the already useful Leipzig Corpora Collection. Since NG is the subject of an on-going international research project involving the German Section at UNAM (cf. e.g. Wiese et al, 2014) relevant results of this and other research projects on NG (e.g. Shah, 2007) could inform the development of an NG dictionary and ultimately involve those researchers in the lexicographic process.

With regard to the development of the communication theory, it seems necessary to explain how coherence in dictionary articles is achieved. This could be accomplished by means of the theory of conversational implicature introduced by Grice (1991, pp. 24-40), or relevance theory (cf. Sperber & Wilson, 1995; Clark, 2013). This article dealt only with the equivalent relation of full equivalence.[15] The communication theory should be developed to show how it deals with the remaining equivalent relations of divergence, zero equivalence and poly-divergence (cf. Gouws & Prinsloo, 2005, pp. 154-161). Furthermore, Nemo's (2007) problematisation of the pragmatic concept *common ground* should be dealt with if the communication theory subscribes to the relevant notions.

5. Conclusion

This article has developed a basic microstructure for the equivalent relation of full equivalence for the planned NGD. A new classification of dictionary purposes was introduced within the framework of the communication theory. The work demonstrates that the communication theory can be applied generatively, i.e. to develop a dictionary model starting from a set of user questions relating to a particular user situation. A formal link between user questions, consultation objectives, lexicographic messages and lexicographic utterances was established in the process of advancing a coherent theory of lexicographical communication.

[15] This is not the true relation that exists between NG *Rivier* and SG *Fluss*, as da_5 and da_{5a} would seem to suggest. The sense 'dry river bed' (SG *Trockenfluss*) is not dealt with. However, as indicated earlier, this relation was assumed for demonstration purposes.

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