SETSWANA NOUN CLASSES

Conceptual Categories Marked by Grammar?

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Cand. philol. thesis
Department of Linguistics
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Chapter 1. Introduction

The aim of this thesis is to investigate the semantics of Setswana noun classes. Is it possible at all to arrive at semantic analyses of these classes?
If it is:
- what will the semantic «content» of the classes be, and
- what «kind of» semantic characterisation will account for this in the most plausible way?

Setswana noun classes

Setswana is one among several Bantu languages in Southern Africa. It is spoken by about 4 million speakers in Botswana (where it is the national language) and South Africa (where it is one among several official languages).

A characteristic trait of all the Bantu languages is their highly elaborate noun class systems.

Dixon (1982:160) has suggested that a noun class can be characterised as follows:

> We can say that the category of noun classes is (1) a grouping of all the nouns of a language into a smallish number of classes, (2) so that there is some overt indication of the class of a noun within any sentence in which it occurs, (3) and this indication is not entirely within the noun-word.

In Setswana all nouns are members of a noun class. The classes can be established on the basis of the concordial system in syntactic structures. We find concordial elements in verbs, pronouns, adjectives, demonstratives, numerals etc. In addition, most noun classes have a particular class prefix attached to the nouns themselves. In many Bantu languages it is not uncommon that the noun prefix and the concordial elements suggest two different noun classes. In Setswana, however, this phenomenon is close to non-existent.

Mo-simane	*yo*	*mo-leele*	*o*	*-*	*rekisa*	*se-lêpê*	*se*	*se-nnye*	*sa*	*Tebogo.*
cl.1-boy	cl.1	cl.1-tall	cl.1		sell	cl.7-axe	cl.7	cl.7-little	cl.7	Tebogo

(The tall boy sells Tebogo's little axe.)

Ba-simane	*ba*	*ba-leele*	*ba*	*-*	*rekisa*	*di-lêpê*	*tse*	*di-nnye*	*tsa*	*Tebogo.*
cl.2-boys	cl.2	cl.2-tall	cl.2		sell	cl.8-axes	cl.8	cl.8-small	cl.8	Tebogo

(The tall boys sell Tebogo's small axes.)

The table below shows the noun prefixes belonging to the 16 noun classes in Setswana.[1] The prefixes in the same row in the table refer to singular and plural forms of the same noun stems (thus, for example: ***monna*** (man, class 1) - ***banna*** (men, class 2), ***selêpê*** (axe, class 7) - ***dilêpê*** (axes, class 8), etc.) The prefixes in the column 'other classes' refer to the «infinitive class» (15) and three locative classes (16-18).

I have adopted the numerical labelling that was established by Meinhof (1899), and is now used as a standard for all Bantu languages. Thus, the table contains the standard presentation of these noun classes.

singular classes		plural classes		other classes	
cl. number	prefix	cl. number	prefix	cl. number	prefix
1	mo-	2	ba-		
1a	--	2a	bo-		
3	mo-	4	me-		
5	le-	6	ma-		
7	se-	8	di-		
9	N-	10	diN-		
11	lo-	10	diN-		
14	bo-	6	ma-		
				15	go-
				16	fa-
				17	go-
				18	mo-

Table 1. Noun class prefixes

Whether or not, or to what degree, the Bantu noun classes reflect semantic categories, is a long debated subject. Some have more or less rejected the idea that these classes are semantically based. Others have suggested that the system *was* semantically transparent at an earlier stage in history, and that the present system, although it may show a few traces of semantics, largely has become a formal system. Contini-Morava (1994:6) puts forward the following reasons to be sceptical towards such a position: Firstly, no modern language with such

[1] 1a and 2a should not be counted as separate classes, as their concordial elements are the same as those of class 1 and 2. Note also that class 6 and class 10 are mentioned twice in the table. They should, of course, not be counted twice.

elaborate noun class systems as we find in Bantu, is attested with completely transparent semantics. Hence, it seems implausible to attribute a property to an ancestral language that has not been attested in any language that we have direct knowledge about. Secondly, how is it possible for the Bantu noun class systems to persist essentially intact, at least formally, for so long (some 3000 years or more), even after they apparently have become «messed up systems» full of anomalies? In other words: why hasn't the system broken down, and led to a reduction of classes, leaving the speakers with a couple of transparent classes like animate - non-animate for instance?

Like Contini-Morava (1994), my own hypothesis has been that the noun classes in modern Bantu languages to a large extent *are* semantically organised. Of course this is not a new or original standpoint: Quite a number of bantuists and linguists have struggled to disentangle the apparently confusing semantics of various classes in different Bantu languages.

Outline of the thesis

This thesis has been structured as follows:

Chapter 2
presents brief accounts of previous and contemporary research on the semantics of Bantu noun classes.

Chapter 3
introduces the theoretical framework that I have used as a starting point for my own analyses.

Chapter 4
provides suggestions for semantic analyses of four selected noun classes. These suggestions are compared to the contributions of other bantuists and linguists.

Chapter 5
describes and discusses a psycholinguistic experiment and its results.

At last, some final conclusions are drawn in *chapter 6.*

Throughout the text I have used double quotes (" ") for *quotations* only. Single quotes (' ') have been used for *terms* (theoretical terms as well as terms for semantic groups established in the thesis), whereas double brackets (« ») have been used in all other cases.

Chapter 2. Previous research

A number of bantuists and linguists have struggled to disentangle the seemingly confusing semantics of the noun classes in different Bantu languages.

Some have written extensive grammars, where a description of the noun classes is only a minor part of the work. Others have explicitly aimed at an analysis of the semantics of the noun classes as such.

It would be impossible within the limits of this thesis to provide an extensive overview of all the work that has been done on Bantu noun class semantics.

I have chosen to relate my own work to a small selection of authors, who are either proponents of certain viewpoints typical for their time, or who have provided the field with novel works.

The nineteenth century bantuists seem to have taken it for granted that the noun classes were based on semantics.

Torrend (1891) was one of the first who wrote an extensive comparative grammar of southern African languages, including a presentation of the noun classes of 36 Bantu languages.[2] He explains his view on the noun classes in this way:

> In the Bantu languages we find no genders based on sex, but instead other *genders* or *classes* of substantives, *based* principally, as I hope will appear in this chapter, *on the degree of unity and consistency* of those things of which they are the names, as determined by their natural position and shape, their proper motions, effects, relative strength, etc.
>
> (Torrend 1891:63)

I interpret him as referring to «things as they appear in the real world».[3] It seems that he is expecting the noun classes to reflect certain «natural groups of things in the world». But that does not (perhaps surprisingly) lead him to present a pure «taxonomy of 'kinds'», in the usual sense. On the contrary, he obviously feels free to connect different «groups of things» based on *different types of similarities* (cf. chapter 2). For example, when he sketches the semantics of class 3, the way of

---

[2] Bleek (1862) was even earlier, and he is more widely known, but I have chosen to refer to Torrend in my thesis, as his semantic descriptions are more exhaustive.

[3] As mentioned in the introduction I reserve double quotes (" ") for quotations and single quotes (' ') for terms. Double brackets (« ») are used elsewhere.

describing different «sub-groups», all belonging to the class, indicates that he in fact implicitly employs metaphorical meaning extensions:[4]

> [...] the substantives which belong to this class are principally: -
> 1. The names of such complete trees and plants as stand up without support [...]
> 2. The names of such tools or artificial objects as remind one of the form of a tree by having branches or bushy parts [...]
> 3. The human and animal body [...] as also such of its parts as branch off in some manner, growing out into accessory parts, or move up and down [...] The same may be said of the similar parts of trees.
>
> (Torrend 1891:79)

Meinhof (1906) who has been considered the «father of Bantuistics», treats the semantics of the noun classes in much the same way as Torrend does.

Meinhof does not explicitly clarify his conception of the noun class semantics, but he organises his treatment of each class according to claims about which semantic groups that the class exhibits. He uses data both from the reconstructed Urbantu and from several contemporary Bantu languages.

Like Torrend, he makes use of different types of meaning relations, assuming, it seems, that different «groups of things» within the same class are semantically connected. From the way he describes the class meanings it is clear that he believes that each class originally had one single meaning, that only later has extended into several different related meanings. For example, he claims that class 6 is "ursprünglich dualisch" (originally dualic), and that "[a]us dem dualischen Sinn hat sich ein kollektiver entwickelt", and "[a]us der kollektiven Bedeutung ist die abstrakte abzuleiten" (Meinhof 1906:8-9).[5] Sometimes it seems that he is lead into deep waters, because he feels obliged to connect even the less easily connectable groups of nouns. For example, he claims that class 5 nouns are the singular counterparts of the "dualisch" (dualic) class 6 (1906:8). Confronted with the fact that most (if not all) Bantu languages include 'fruits' in class 5, he suggests the following connection between the «dual» and the fruits:

> Früchte zerfallen entweder von selbst in zwei Teile oder werden vom Menschen, da er zwei Hände hat, regelmäßig in zwei Teile zerlegt.
>
> (Meinhof 1906:10)[6]

---

[4] I have not included the exhaustive list of his "class 3 sub-groups", as this is only meant as an illustration of the type of groups that he proposes.

[5] In English translation: "from the dualic sense a collective has developed", and "from the collective meaning the abstract is derived".

[6] In English translation: "Fruits either divide into two parts by themselves, or are regularly divided into two parts by humans, *because they have two hands.*"

As the field of linguistics developed, and structuralist approaches became the «leading trend» (in the beginning of this century), it must have become increasingly difficult to operate with the somewhat «loose» type of semantic explanations that many of the «old bantuists» had used. If one could not establish *one* semantic feature (or bundle of features) that represented the necessary and sufficient criteria shared by all members in a class (as in a «classical» or Aristotelian category), one would have to conclude that the class was not semantically based.

For some decades the whole issue of the semantics of the Bantu noun classes was questioned among many linguists. It was argued that the noun classes represented purely formal systems. An often quoted proponent of such a view is **Richardson** (1967). He rejected not only semantic descriptions of contemporary Bantu languages, but even the idea that the classes could have a semantic *origin*: He concludes a discussion with the following statement:

> [...] it is impossible to prove conclusively by any reputable methodology that nominal classification in Proto-Bantu was indeed widely based on conceptual implication [...]
>
> (Richardson 1967:378)

However, it seems that such an absolute rejection of semantic content in the noun classes has been difficult to live with for the many authors of Bantu grammars and textbooks.

Cole's (1955) standard grammar of Setswana is not an exception:

> Although most of the noun classes are miscellaneous in content, certain trends of significance are recognizable. Thus most personal nouns are included in Class 1 [1/2], most names of animals in class 5 [9/19], and most abstract nouns in class 7 [14/6], though such nouns are also found in other classes. Sometimes the same stem may be used in different classes, resulting in a change or modification of its significance [...].
>
> (Cole 1955:69)

The typical approach, it seems, has been pure listing of noun groups described as semantically similar. Cole's «semantic description» of the content of class 3/4 and 5/6 represents an example:

> Nouns of this class are miscellaneous and impersonal. They include names of parts of the body, tools and instruments, animals, a few special terms applied to domestic animals, natural phenomena, and most names of trees and plants.
>
> (Cole 1955:75, about class 3/4)

> This miscellaneous class includes, among others, names of parts of the body, animals, plants, natural phenomena, some collective nouns, and a number of personal nouns.
>
> (Cole 1955:79, about class 5/6)

Denny and Creider (1986) introduce a new and radically different approach to the noun class semantics. They criticise the typical conclusion of the time, that:

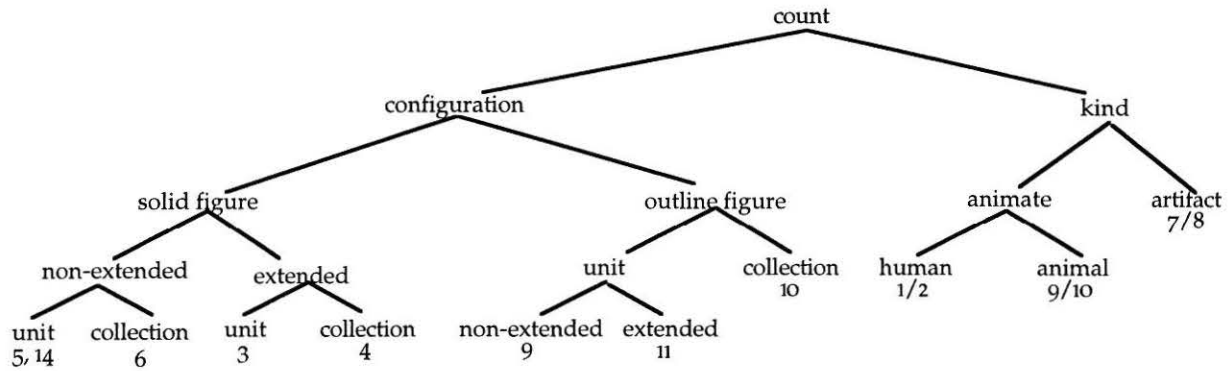
> [...] while all or most members of certain natural classes of entity may be placed in the same class (familiar examples are the placement of trees in class 3/4 and fruits in class 5/6, *the classes themselves have no overall intrinsic semantic content* (with the frequent exception of class 1/2 for humans).
>
> (Denny & Creider 1986:217)
> (My italics)

They present a study of Proto-Bantu (PB) noun forms, and conclude from it that:

> [...] PB noun prefixes realized a semantic system where *each prefix was associated with a particular characteristic meaning*. [...] [W]e will be claiming that the bulk of the noun prefixes were associated with *configurational or shape meanings*.
>
> (Denny & Creider 1986:217)
> (My italics)

They use as «direct evidence» an examination of Proto Bantu vocabulary, and as «indirect evidence» a discussion of noun classifier sets found in other languages throughout the world.

The figure below reproduces Denny and Creider's (1986:219) presentation of Proto-Bantu noun class semantics for count nouns[7]:



[7] They present the semantics of mass nouns in a separate diagram.

Batibo (1987) represents the rather commonly held view that the contemporary Bantu noun classes are «distorted» versions of an earlier salient system. He uses Proto-Bantu material, and aims at showing that the ancient Bantu had developed a noun class system where each class exhibited only one «class meaning».

He suggests the following «class meanings» for the classes 1/2 - 7/8 (Batibo 1987:18):

cl. 1/2 : "human"
cl. 3/4 : "planted"
cl. 5 : "itematized"
cl. 6 : "amassed"
cl. 7/8 : "marked"

In his conclusion Batibo (1987:21) writes that his:

> [...] study has shown that by using the typically Bantu noun stems which are assumed to represent the earlier Bantu nouns, it is *possible to arrive at common semantic features for each class or grammatical gender.* [...] It has been demonstrated that *the noun class systems in the contemporary languages have lost the original regularity due to both formal and semantic shifts.*
>
> (My italics)

Spitulnik (1987:7) rejects the position that the " 'random', 'non-systematic' state of present day Bantu languages is [...] a semantically white-washed relic of a more homogeneous proto-system [...]".

She also questions the «tradition» of accounting for the semantic organisation of the noun class systems by "giving an *inventory* of the *typical referents* of the morphologically distinct classes" (Spitulnik 1987:8). (Cf. the «old bantuists»)

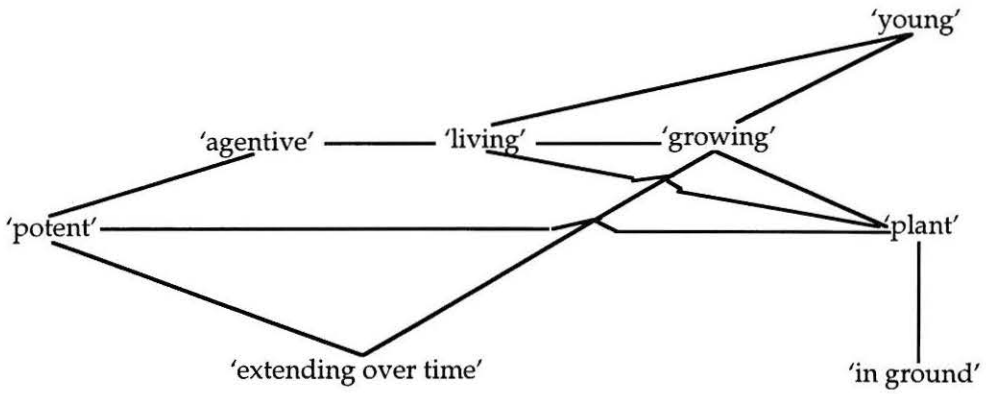
Spitulnik (1987:8-11) gives Denny and Creider credit for their "thought-provoking study", and characterises their approach using a «feature analysis» as more promising than the «natural kind approach», "since at a higher level of abstraction (describing features of referents rather than types of referents) a wider range of semantic relations can be covered". While also admitting that some of their conclusions are supported by her own work on ChiBemba, she criticises their work because their analysis is only based upon "questionable proto-forms

with questionable proto-class assignments"[8], completely leaving out contemporary Bantu languages, and she questions "the advantage of reducing the noun class system to sets of binary oppositions".

In her own contribution, the terms 'notional value' and 'notional core' are central:

> We can characterize Bantu noun classes as having *central notional values*, i.e. notional values which quite pervasively characterize the denotata of a class. However, for most classes there are a number of notional values, no one of which appears to dominate over the others.[...] Since these central notional values are often semantically linked to one another, together they are like a 'notional core' of a form class. We should note however, that this type of 'notional core', unlike those of Indo-European gender systems:
> i. usually consists of a *number* of notional values, not just one, and
> ii. characterizes a great majority (if not all) of the denotata of the class in question.
> Together, (i) and (ii) yield a picture of Bantu noun class systems as intricately structured by notional values, with a minimum of randomness to noun class membership.
>
> (Spitulnik 1987:25)

As an example, the figure below reproduces Spitulnik's representation of the 'notional core' of ChiBemba class 3/4 with all the 'notional values' and the associations between these values:



(Spitulnik's figure 9, 1987:61)

Contini-Morava (1994:6) also suggests that the problems of characterising the semantics of the Bantu noun classes "lie not with the languages, but with the assumptions about the nature of linguistic categorisation that are brought to bear

---

[8] She goes into details about *why* she claims that the proto-forms and the proto class assignments are doubtful. I will not include those details here.

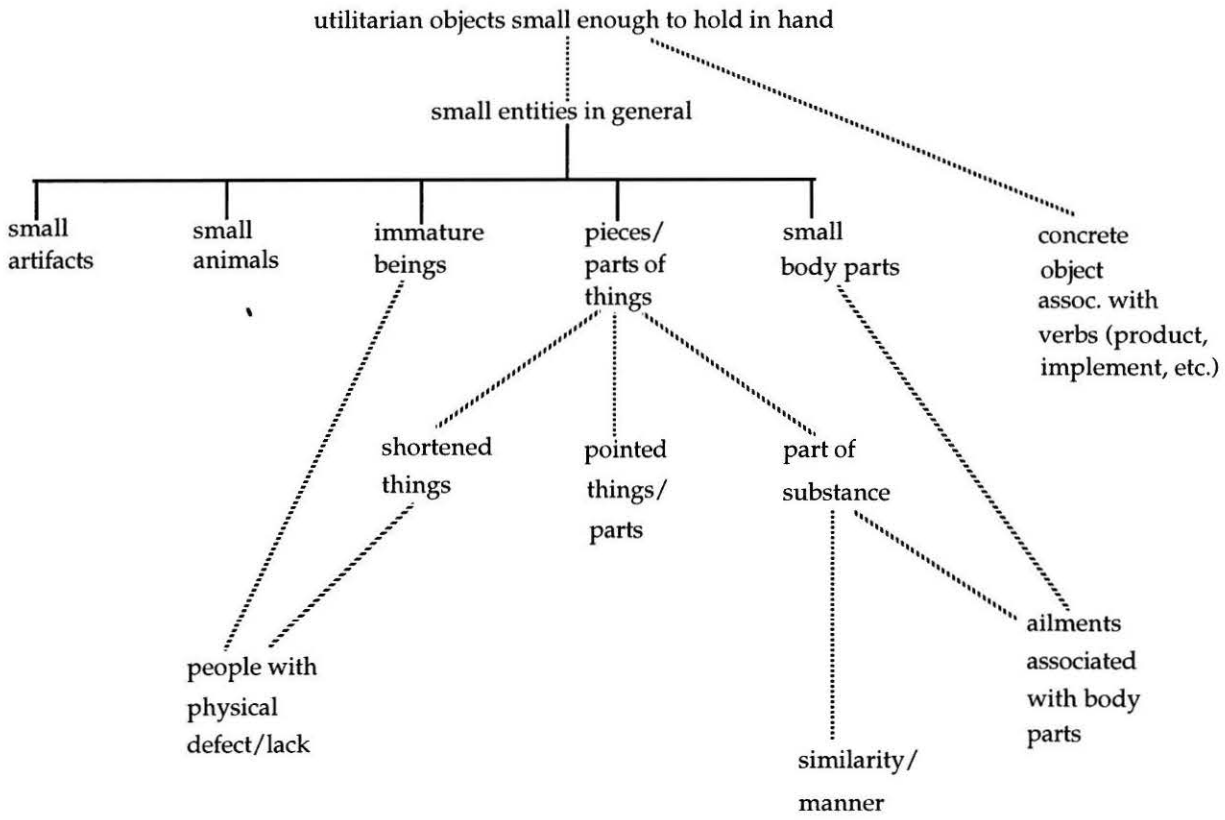
on this question". She rejects the idea that one has to "abandon the search for semantic coherence and settle for a heterogeneous list" when no "set of common properties shared by all nouns in a given class" can be found.

Contini-Morava points out that within the framework of Cognitive Grammar (cf. Lakoff 1987; Langacker 1987, 1990; Rudzka-Ostyn 1988):

> (it) has been argued that membership in a given linguistic category (for example, a noun class) may be based on multiple criteria, including 'family resemblances', metaphor, and metonymy, and that linguistic categories may exhibit an internal structure in which some members of the category are more central, or prototypical, and others are more peripheral.
>
> (Contini Morava 1994:6)

Based on a noun database of contemporary Swahili, and with Cognitive Grammar as a starting point, she presents semantic networks ("schematic representations of semantic structure") for some of the Swahili noun classes.

The following example is a graphical representation of the semantic network for Swahili class 7:



(Contini Morava's class 7 figure, 1994:13)

> The top-to-bottom organization of the diagram moves from the more general to the more specific, but the diagram is not intended to be a 'taxonomy' in the technical sense [...]. I have borrowed the conventions used by Langacker (1988) for the representation of a linguistic category. Langacker defines two basic types of semantic relationships among elements in a category: (a) relations of 'schematicity' in which one element is an 'elaboration' or 'instantiation' of another, more abstract element (represented by solid lines in the diagram); (b) relations of 'extension', in which some feature specifications are suspended or modified, while other features are retained (represented by dotted lines in the diagram).
>
> (Contini Morava 1994:10-11)

The main difference between Spitulnik's and Contini-Morava's approaches is that Contini-Morava introduces a notion of schematicity (the idea that some elements in a category may be more generalised or abstract than others) and the possibility that some category member(s) may be more central than others.[9]

This has been a brief presentation of some approaches to the semantics of Bantu nominal classes.

It is interesting to note that the earliest and the most recent approaches referred to here have something in common: the implicit or explicit use of different principles of semantic *associations* that bind together various groups of nouns within each single noun class. That is a viewpoint that will be carried on in the analyses in this thesis. There is, however, a big difference between the early and the recent approaches: Whereas «the old bantuists» seemed to believe that their semantic descriptions pointed out groups of objects or phenomena in the «real world», linguists like Spitulnik (1987) and Contini-Morava (1994) make clear that they are not describing groups of «real-world objects or phenomena», but rather the semantic organisation of human concepts.

I will base my own analyses on the assumption that noun class semantics is not about grouping and labelling «real-world objects or phenomena». Rather, I believe that it reflects parts of human conceptualisation.

In chapter 3 I will present briefly parts of the theoretical framework that is known as Cognitive Grammar. In chapter 4 I will make use of some of the «theoretical tools» provided by such a framework, when I suggest semantic analyses of Setswana noun classes.

However, together with my analyses, I will refer to and discuss ideas and insights of all the aforementioned bantuists and linguists.

---

[9] See chapter 2 for a further explication of 'schematicity' and 'centrality'.

Chapter 3. Theoretical approach

Introduction

It is a startling fact that such a semantically intriguing area as the Bantu nominal class semantics is something to which relatively little attention has been paid; much less than one could expect considering the large number of Bantu languages spoken by millions and millions of speakers, and the nominal class system exhibiting such a prominent part of these languages.

The reason can be ascribed, I believe, to the commonly held view (in linguistics) that *categories* are to be defined in terms of a set of necessary and sufficient features shared by *all* category members, and that these features correspond to measurable and objective aspects of external reality. I will refer to this view of categories as the 'classical approach'.

With such an approach as a starting point (explicitly or implicitly) it is more or less self-evident that one has to give up a semantic description of the noun class categories: What could possibly be the «objectively» common features of a morula tree, a pestle, a dance, a leg and a pot used for cooking medicine? These are all examples of (translated) Setswana class 3 nouns. Failing to find the common features that would be the necessary and sufficient defining criteria for class membership, would leave us with the conclusion that these class 3 nouns are not members of the category 'class 3' by virtue of any semantic principle.

The 'classical approach' to categories includes an implicit assumption that the categories we are dealing with have an existence «out there in the real world» independent of the minds and conceptual apparatus of the human beings that perceive them.

Taylor (1989) labels the 'classical approach' to categories the «criterial-feature approach», and suggests that within such a framework

> [...] features in a sense pre-exist the entities they define: categories result from the combination of features selected from a pre-existing universal inventory, and things are assigned membership in a category by a process of 'checking off' their feature specifications.
>
> (Taylor 1989:524-5)

Seeing that the 'classical approach' to categories inevitably leads to the conclusion that most Bantu nominal classes, because of their apparently rather heterogeneous nature, can not be described in term of semantics, we are faced by two options: Either we have to settle for the «arbitrariness conclusion», which is clearly unsatisfactory considering the rather commonly expressed intuition

(among grammarians and language users alike) that there *is* «something semantic» about the noun classes. Or we have to take another look at *categories* and how they may be structured.

In this chapter I will present the starting point from which my own suggestion for a semantic treatment of the Setswana noun classes departs.

The noun classes are examples of linguistic *categories*. Choosing a conception of 'category' in general is essential for any treatment of a phenomenon like nominal classes.

In doing so, I will inevitably touch upon some very central philosophical and linguistic debates concerning categorisation in general. I will, of course, not try to embrace neither the width nor the depth of any of these debates. That would reach far beyond the scope of this thesis, which aims at throwing some new light upon the semantics of the Bantu noun classes. Rather, I have restricted this presentation to covering briefly only those fundamental assumptions concerning categories, and those «theoretical tools» *that have enabled me to present a suggestion for a semantic analysis of the Setswana noun classes.* The choice of approach has been governed by an evaluation of earlier attempts to «solve» the problem of nominal class semantics in Bantu languages, and the dissatisfaction with the «arbitrariness conclusion».

«Family resemblance»

A relatively recent alternative to the 'classical approach' to categories, is an approach based on *networks of related senses* (cf. Lakoff 1987, among others). Although I have labelled this alternative «relatively recent», it is clear that it is built on many important insights stemming from linguists, psychologists, anthropologists and philosophers, not all of whom are «recent».

That some categories may be structured as *"complicated networks of similarities"* rather than in terms of a set of common features, was suggested by the philosopher Wittgenstein as early as 1953. His conception of such categories is commonly known and referred to as the 'family resemblance' approach to categories.

His famous and much-quoted passage about the category 'games', illustrates in an illuminating manner what he means by a "network of similarities":

> Consider for example the proceedings that we call "games". I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all? - Don't say: "There *must* be something common , or they would not be called 'games' " - but *look and see* whether there is anything common to all. - For if you look at them you will not see something that is common to *all*, but

> similarities, relationships, and a whole series of them at that. To repeat: don't think, but look! - Look for example at board-games, with their multifarious relationships. Now pass to card-games; here you find many correspondences with the first group, but many common features drop out, and others appear. When we pass next to ball-games, much that is common is retained, but much is lost. - Are they all 'amusing'? Compare chess with noughts and crosses. Or is there always winning and loosing, or competition between players? Think of patience. In ball games there is winning and loosing; but when a child throws his ball at the wall and catches it again, this feature has disappeared. Look at the parts played by skill and luck; and at the difference between skill in chess and skill in tennis. Think now of games like ring-a-ring-a-roses; here is the element of amusement, but how many other characteristic features have disappeared! And we can go through the many, many other groups of games in the same way; can see how similarities crop up and disappear.
>
> And the result of this examination is: we see a complicated network of similarities overlapping and criss-crossing; sometimes overall similarities, sometimes similarities of detail.
>
> I can think of no better expression to characterize these similarities than "family resemblances"; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way. - And I shall say: 'games' form a family [...]
>
> (Wittgenstein 1958:31-2, first edition 1953)

In other words, Wittgenstein suggests that we can not find a uniform set of features that constitute the meaning of a linguistic expression. What we *can* find is a network of similarities between *different uses* of an expression.[10]

Prototypes

While Wittgenstein (1958, first edition 1953) pointed out the possibility that a category might be internally structured as a network of similarities, others have focused on the possibility that that within such networks some member(s) might be more central than others. The most central member can be called a prototype.

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[10] I have noted that Wierzbicka (1990:356-8) asserts that "the time has come to re-examine his [Wittgenstein's] doctrine of 'family resemblances' which have acquired the status of unchallengeable dogma in much of the current literature on meaning", and that she claims that it *is* possible to define the concept of 'game' in terms of essential components that all 'games' have in common. I will , however, neither go into details about the nature of the definition that she proposes, nor take a stand on her critique, as my intension here only is to draw attention to a central precursor of the conception of 'semantic networks'. And I still think that Wittgenstein's example represents an elucidation of a phenomenon that exists in languages, irrespective of the actual example: 'games'.

According to Tsohatzidis (1990:1) a prototype approach to linguistic categories involves two central claims:
1) "[F]or the most part, linguistic categorization exploits principles that are not specific to language but characterize most, if not all, processes of cognition."
2) "[O]ne of the basic principles according to which cognitive and (under their influence) linguistic categories are organized is the prototype principle - that is to say, a principle whereby elements are assigned to a category not because they exemplify properties that are absolutely required of each one of its members, but because they exhibit to a greater or lesser extent (or are simply *expected* to exhibit to a greater or lesser extent) certain types of similarity with a particular category member that has been (naturally or culturally) established as the *best example* (or prototype) of its kind."

The psychologist Rosch (1973), because of her extensive experimental research, has become known as the initiator of this theoretical tradition. The tradition is, however, not unambiguous. According to Taylor (1989:59) "[t]here are two ways in which to understand the term 'prototype'. We can apply the term to the central member, or perhaps to the cluster of central members, of a category. Thus, one could refer to a particular artefact as the prototype of CUP. Alternatively, the prototype can be understood as a schematic representation of the conceptual core of a category. On this approach, we would say, not that a particular entity *is* the prototype, but that it *instantiates* the prototype."[11]

It is, however, not automatically clear exactly what kind of status a «schematic prototype» has: for example in Langacker's glossary (1987:492) he defines a prototype as "[t]hat unit in a schematic network which is naturally most salient, most often thought of, most likely to be chosen as representative of the category." But then he adds: "In a generalized sense, the term is also adopted for the standard in a categorizing relationship based on extension rather than schematicity." (Cf. the section below for a clarification of terms.) As far as I can understand, there is a conflict between these two definitions: The second definition will always be compatible with the first one, but the opposite doesn't need to be true. If one postulates a «psychologically salient» prototype in a category, it will of course by definition be possible to claim that this prototype

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[11] In a footnote Taylor (1989:59-60) calls attention to Rosch' later apparent rejection of both these alternatives, as she according to him "content[s] herself with a characterization of prototypicality merely in terms of its experimental effects (membership judgements, reaction times, etc.)".

represents the standard to which some other member in the category is compared. However, in a large network consisting of several comparisons, one will easily find, within the more peripheral parts of the network, standards to which something else is compared, but which exhibit no saliency.

I will touch upon this issue later in this theses, but I will not make it a major question. That would require a study of another kind, and would reach far beyond the scope of this thesis, which aims at suggesting semantic structures for selected Setswana noun classes. While the question of prototypicality clearly touches my treatment of the classes, it is not the main point of concern.

Schematic networks

In his *Foundations of Cognitive Grammar* (1987 and 1991) Langacker aims at an alternative theoretical approach to language in general, built on the general assumption that linguistic organisation can be characterised in terms of *cognitive processing*. He admits that cognitive grammar is "not a finished or formalized theory" and is "more realistically viewed as an evolving conceptual framework". (Langacker 1987:2) Nevertheless, he has certainly, I would argue, provided the field with some «theoretical tools» that, among other things, have proved useful in trying to come closer to an understanding of the fascinating, but apparently chaotic field of Bantu nominal class semantics.

As will become clear in chapter 4, the semantic studies of Bantu noun classes may benefit from Langacker's conception of *schematic networks*.

A schema for Langacker (1987:37) is:

> an abstract characterization that is fully compatible with all the members of the category it defines [...]; it is an integrated structure that embodies the commonality of its members, which are conceptions of greater specificity and detail that elaborate the schema in contrasting ways.

A schematic network, according to him (Langacker 1987:380) includes:

> a finite set of nodes, which can be linguistic structures of any sort. Every node is linked to at least one other through a categorizing relationship, of which there are several types: full schematicity (at varying elaborative distances); partial schematicity (with varying degrees of [standard/target] discrepancy); or a bidirectional relationship decomposable into component relations of the aforementioned kinds.

In the following I will refer to the two relation types 'full schematicity' and 'partial schematicity' as *instantiation relationships* and *extension relationships* respectively.

Extension relationships, according to Langacker (1991:548), consist of a "categorizing relationship involving some conflict in specification between the standard and the target". (A standard is here understood as a basis for comparison or categorisation, while a target is the unit that is being evaluated relative to the standard.)

As a notational convention, Langacker uses broken-line arrows to represent relationships of extension, and solid arrows to represent instantiation relationships:

TREES ·························► LONG BODY PARTS

In the example above, the direction of the «extension arrow» shows that 'trees' are represented as the standard to which 'long body parts' is compared.[12] The relationship is clearly not one of instantiation ('full schematicity'), as 'long body parts' can not be considered a subcase of 'trees'. Neither can 'trees' be considered a subcase of 'long body parts'. Rather, there are obvious conflicts in the specifications of the two concepts. Nevertheless, they can be compared, and it is not difficult to perceive similarities between them. One such similarity is that the notion *'long'* can be extracted from both concepts.

An *instantiation* for Langacker (1987:489) is an elaboration of a more abstract schema "consistent with its specifications, but [...] more fully and precisely specified". In other words it represents a «subcase of a schema». Thus, in the example above the shared quality of being 'long' can be represented as another, and more generalised schema ('long'), and 'trees' and 'long body parts' can be represented as instantiations of that more abstract schema:

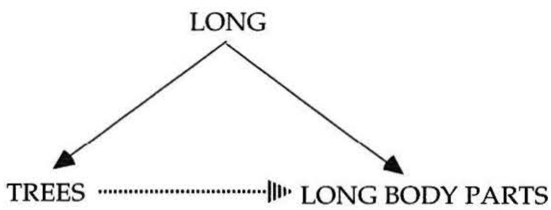

figure 1

[12] Since the aim here only is to clarify the reading of the networks that I will propose later, I will not discuss the reasons for choice of direction of the arrow in this particular example.

We can of course elaborate the two instantiations of 'long things' further as well. Then we have a graphical representation of a tiny part of what I will later suggest is the schematic network of Setswana class 3:[13]

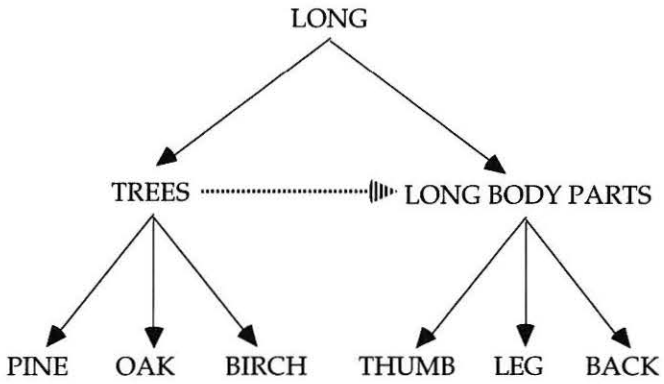

figure 2

It is of great importance to note that even if such a representation looks equivalent to a taxonomic hierarchy with superordinate and subordinate nodes, all the nodes are to be understood as *conceptual schemas*: Even the more specific 'oak' is to be understood as a generalised conception, and not as one or all concrete oak(s) in the real world. The «hierarchy» is only a graphical method of conveying degrees of specificity and generality.

In sum: an abstract schema reflects a commonality between two (or several) more elaborated concepts. This commonality is *extracted* by the language user on the basis of a comparison between a 'standard' (or prototype in the most generalised sense) and a 'target'. When the comparison results in a judgement of similarity (of a certain type and degree), a more generalised (more abstract) schema can be posited. In other words: Langacker (1987:372) claims that three cognitive entities figure in a similarity judgement: the prototype, the entity that is compared to the prototype, and finally: a representation of their perceived similarity (referred to as SCHEMA in the figure below):

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[13] I have left out the extension relationships between the most specific concepts in this example, as that is not needed for this general presentation of the model.

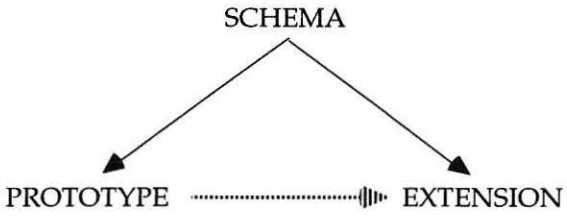

figure 3

Thus, we see that Langacker's model provides a synthesis that treats the prototype model and the model based on schematicity "as special cases of a unified phenomenon and relates them in integral fashion to the network conception of complex categories" (Langacker 1987:371).

For convenience, the convention is that instantiation relationships are represented vertically, and extension relationships horizontally. That eases the interpretation, especially in very complex networks of relations.

Metaphor, metonymy and synecdoche

According to Taylor (1989:122) metaphor and metonymy are "two of the most important processes whereby different meanings get associated". The association processes referred to are equivalent to what Langacker (1987) refers to as relations of extension. So in a schematic network, we need the notions of metaphor and metonymy to explicate in more detail the different extension relationships.

While originally being a term from traditional rhetoric (referring to figural speech like «she has a heart of stone»), *metaphor* has become an object of research for «cognitive linguists» (see for example Lakoff and Johnson 1980). After outlining and criticizing the tradition of capturing the essence of metaphor by a notion of «violation of selection restriction», Taylor (1989:132-3) writes:

> [...] the cognitive paradigm sees metaphor as a means whereby ever more abstract and intangible areas of experience can be conceptualized in terms of the familiar and concrete. Metaphor is thus motivated by a search for understanding. It is characterized, not by a violation of selection restrictions, but by the *conceptualization of one cognitive domain in terms of components more usually associated with another cognitive domain.* (My italics.)

Metonymy has in traditional rhetoric been defined as "a figure of speech whereby the name of one entity *e1* is used to refer to another entity *e2* which is contiguous to *e1*" (Taylor 1989:122). When somebody says «Peter really likes milk; every morning he drinks two glasses», we easily understand that he is not literally drinking the glasses, but their content.

Taylor (1989:122-30) argues that "the essence of metonymy resides in the possibility of establishing connections between entities which *co-occur within a given conceptual structure*" (my italics), and that metonymy's place in language is of much greater importance than the definition above indicates. He claims that "metonymy turns out to be one of the most fundamental processes of meaning extension".

The particular case where reference to the *whole* is made by reference to a salient *part* (like referring to a person by the term «curlyhead») is also sometimes subsumed into the category 'metonymy'. In my analyses I shall refer to this, not as metonymy, but as *synecdoche*.

Polysemy

Polysemy traditionally has been regarded as the phenomenon that one word/lexical item has a range of different, but related meanings.

More recent research, however, indicates that grammatical categories also may exhibit such clusters of related meanings (cf. for example Lakoff 1987 and Croft 1990).

The 'schematic networks' that are proposed in my semantic analyses of the Setswana noun classes, can be seen as graphical representations of *polysemous categories*. Thus, the networks should be read as 'polysemy charts'. In this case the elements that exhibit a polysemous structure, are the noun class prefixes (or rather, the whole noun class concordial system).

In the introduction to this chapter I gave a few examples of Setswana class 3 nouns that immediately might seem difficult to connect to the same category (class 3) on a semantic basis: morula tree (*morula*), pestle (*motshe*), dance (*mminô*), leg (*molêtsê*), and pot used for cooking medicine (*morurêlô*). In chapter 4 we will see that it is possible to point out motivations for the connection of all these nouns (or rather: the concepts that these nouns refer to) within a large 'network of similarities'. To do so, we need the notions of schematicity, prototype, instantiation and extension relationships (including metaphorical and metonymical extensions) that has been briefly presented in this chapter.

Chapter 4. Analysis

4.1. Introductory remarks

In this chapter I will present my suggestions for semantic analyses of the Setswana noun classes 3, 5, 6, and 7. The point of departure has been an assumption that adopting Cognitive Grammar's conception of categorisation and semantic networks (as briefly accounted for in the preceding chapter) might be useful for the understanding of Bantu nominal class semantics.

For each class I have suggested a network of semantic connections. I first present the complete network as a graphical representation, and then go into more detail about each group of concepts and the different semantic relations that exist between them.

In the graphical representations 'schemas' are represented as square boxes. These are connected by broken-line arrow, representing extension relationships, and solid-line arrows, representing instantiation relationships. It will be clear from the text, that the extension arrows don't necessarily imply the *same kind of* extension relationships. The text will clarify in each case the nature of the semantic extension in question (whether it is based on metaphor or metonymy, what the basis for the metaphor/metonymy is, etc.).

The most abstract (or generalised) schemas in each class are the topmost ones in the figures. They represent generalisations over many other schemas, and are not themselves represented as instantiations of any other schema. I have called them *'class schemas'*, because they can be used as general characterisations of the classes' semantics. I have also used the term *'local schema'* in a few cases. The local schemas also represent generalisations over two (or more) other schemas, but they are not important to the overall semantic characterisation of the classes.

For each class I have suggested one schema as a class prototype. In doing so, it is evident that I have chosen a schematic interpretation of the notion 'prototype' (cf. chapter 3). I have not, however, equated 'prototype' with a 'standard for comparison'. If standard and prototype are interpreted as the same phenomenon, a semantic network will exhibit multiple prototypes. In one respect that might be justified; for in most 'similarity judgements' *one* entity is the standard to which another entity is compared. Thus, the standard might often represent the most typical (prototypical) instantiation of the abstract schema emerging from the comparison. However, with such a perspective we will miss a conspicuous aspect of the semantic patterns represented here as «class networks»,

namely the tendency that *one* schema in the network seems to be the main point of departure for the other extensions. Accordingly, I have posited *one* prototype schema for each class (indicated in the figures by boxes with thick lines).

In some cases there are additional independent reasons for suggesting that a schema has the character of a prototype. Such reasons could be: productivity, saliency, relative size (number of instantiations), and so forth. Whenever such factors are relevant, they are pointed out in the text. That such factors can be found at all, suggests that my main interpretation of 'class prototype' (that the prototypes mainly can be established on the basis of *central position* within the schematic network) perhaps is unnecessarily weak.

Within the proposed schematic networks one could easily «break up» the least generalised schemas and then suggest additional generalisations (represented as new schemas) over smaller groups of concepts. My network representations are of course not meant to be the full and only representations. I have focused only on those generalisations that seem to offer very general semantic characterisations of the classes.

In the text, the notions 'group of concepts', 'group of notions', and 'group of nouns' are mingled together. They all refer to the same: groups of concepts as *mental representations.*

In the coming sections, I begin the presentation of each noun class by referring to the semantic characterisation given in the standard grammar of Setswana. Then I briefly present (chronologically) some extracts from the works of those bantuists and linguists whose works I have referred to in chapter 2, before I explicate my own suggestions for semantic analyses. After the treatment of each class I discuss my own contribution in relation to the contributions provided by the other authors referred to. A more general conclusion is drawn in the last section of the chapter.

4.1.1. Selection of data

The analyses are built on a study of a random sample of nouns from the Setswana - English - Setswana dictionary (Matumo (comp.) 1993). In order to work with multiple categorisations of each noun (in the process of searching for larger «class patterns»), I established a data base that enabled me to sort information tagged onto each noun in many different ways.

I started by entering each 10th. noun of all the singular classes plus the non count class 6 into the data base, that is: class 1 (and 1a), 3, 5, 6, 7, 9, 11, 14. After the

first tentative attempts to arrive at relatively consistent analyses, I realised, however, that the project would benefit from limiting the number of classes under consideration, while enlarging the data material for the selected classes. I chose to work with the classes 3, 5, (non count) 6, and 7. The data base entries for these classes were doubled; the data material now consists of a random sample of each 5th. of these nouns in the dictionary, altogether 620 nouns. Class 3, 5, and 7 are large, and semantically they appear to be highly heterogeneous (thus, referred to in grammars as «miscellaneous» classes). The non count part of class 6 is not as large, but the connection between semantics and the «portion» of terms that a language grammatically treat as uncountable, is an interesting one. The classes that I decided to leave out of the analyses then were:

- the «human» class 1 (including exclusively human terms), and the small sub class 1a with a majority of human and animal terms (often animals with human connotations in one way or another),
- the large prefix-less class 9 which sometimes is referred to as the «animal class» as a lot of animal terms belong here, but which also seems to attract a lot of borrowings,
- class 11 which in Setswana is small and in the process of disappearing; an increasing number of class 11 nouns shift to class 5,[14] and finally
- class 14 which exhibits (although not exclusively) a lot of abstract concepts.

Class 9 is the only one of these classes that represents as great a challenge as the classes that I chose to work with. It is a large class, and apart from the numerous animal terms and various borrowings it also includes a variety of other terms. Ideally I should therefor have included it, but after working on the other classes, I soon realised that including class 9 as well would be too big a task for a thesis of this kind.

In the analyses, I have left out the few animal terms and most abstract terms in my sample. In order to integrate these terms in a proper manner, I would have to compare them to the «animal class» 9 and the «abstract class» 14.

When I started to enter the nouns into the database, I had only vague ideas of how to categorise them. Each noun stem was entered together with information of class affiliation (singular and plural prefixes), dictionary definition, source of derivation in cases of derived nouns, and finally very general semantic classifications, like «concrete object», «human», «plant», etc.

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[14] It would of course be interesting to investigate the ongoing replacement of class 11 nouns into class 5, but it would require a study on its own.

After that first rough sorting, and after comparing lists of nouns from the different classes with one another, I slowly became aware of similarities of various kinds between larger or smaller portions of nouns within each class. For each new possibly relevant semantic category, I had to return to the data base and add or replace tags. Reorganising the nouns according to new categories often led to further suggestions, which made it necessary to add or remove still more tags in the database.

Contini-Morava (1994:8) points out an important problem with tagging semantic categories onto nouns in this way, when she states: "In order to create a database, one has to anticipate which classificatory categories will be useful before entering the data, in a way guessing at the very analysis that the tool is intended to help discover."

There is of course no certain way to ensure that I am not only thrusting my own categories on the data. But it is possible at least to minimise the problem: By comparing my suggested analyses with other works on Bantu noun class semantics, and with comparable data from other languages or other parts of language, it should be possible to avoid the most fundamental misrepresentations. The aim of a study of this kind will at any rate be a *suggestion* for a semantic description, not a presentation of the «true and only» analysis.

4.2. Class 3

In this section (4.2) I will suggest that the class 3 network centres around the prototype 'tree', and that the network of different schemas all related (directly or indirectly) to the prototype by extensions of varying types, result in the two class schemas: 'living' and 'long'.

Both schemas reflect categorisation principles that are relevant in many other languages, namely: degree of animacy *and* configuration.

First, however, I will present briefly some other suggestions for the semantics of class 3 in various Bantu languages.

Earlier treatments of the semantics in Bantu class 3

Cole (1955:75) in his standard Setswana grammar gives the following description of class 3: "Nouns of this class are miscellaneous and impersonal. They include names of parts of the body, tools and instruments, animals, a few special terms applied to domestic animals, natural phenomena, and most names of trees and plants".

In treating the semantics of class 3 in various Bantu languages, most (if not all) authors have recognised the fact that almost all names for trees, and a lot of other plants, are found in this class. More or less different generalisations over this class' members all seem to be compatible with this fact.

Torrend (1891:80) concludes his treatment of Bantu class 3 in this way: "[...] it seems pretty evident that the predominant notion in this class is that of «objects which are light, move, change, grow, produce, or, in general which contain some *principle of life and production*, a notion intimately connected with that of *'power of growing up'* like a tree»."

Meinhof's (1906:6) concluding description is: "Belebtes, aber nicht persönliches" (living, but not human).

Within Denny and Creider's (1986:220-1) binary system, Proto Bantu class 3 refers to units of 'extended solid figure' (within the larger group of configurational count nouns). They define extended as "characterized by relative length in one dimension at the expense of the other two, or less often, by relative length in two dimensions at the expense of a third". They also discuss the possibility of a development of 'kinds' from the configurational classes, and then suggest that class 3 contains plants as far as 'kinds' are concerned.

Batibo (1987:10) claims that ancestral Bantu speakers categorised class 3 nouns as objects "planted" in space or time.

Spitulnik (1987:56-7) uses the label 'potent/living' for class 3 in ChiBemba, and she argues that 'tree' is the prototypical member of this class.

Contini-Morava (1994:10-12) characterises class 3 nouns in Kiswahili as referring to "entities with vitality (neither human nor prototypically animal)", and she claims that plants/trees are the most central subcategory.

Proposal for a schematic network of Setswana class 3

My own suggestion for Setswana is (not surprisingly) that class 3 members centre around the prototypical notion 'tree', and that it is possible to extract from the network, the abstract class schemas 'living', and 'long'.

I will present graphical representations of the extension relationships and the instantiation relationships before I go on to describe each schema in the network. (The numbers in brackets within each «box» representing a schema, correspond to the numbers in the text dealing with the different schemas.)

For graphical reasons I have chosen to present the instantiation relationships «belonging» to each class schema ('long' and 'living') in two figures. They should of course be read as integrated parts of the same network, but graphical constraints make it difficult to present a readable version with both shemas integrated into the same figure.

The extension relationships in class 3 can be represented as in the following figure:

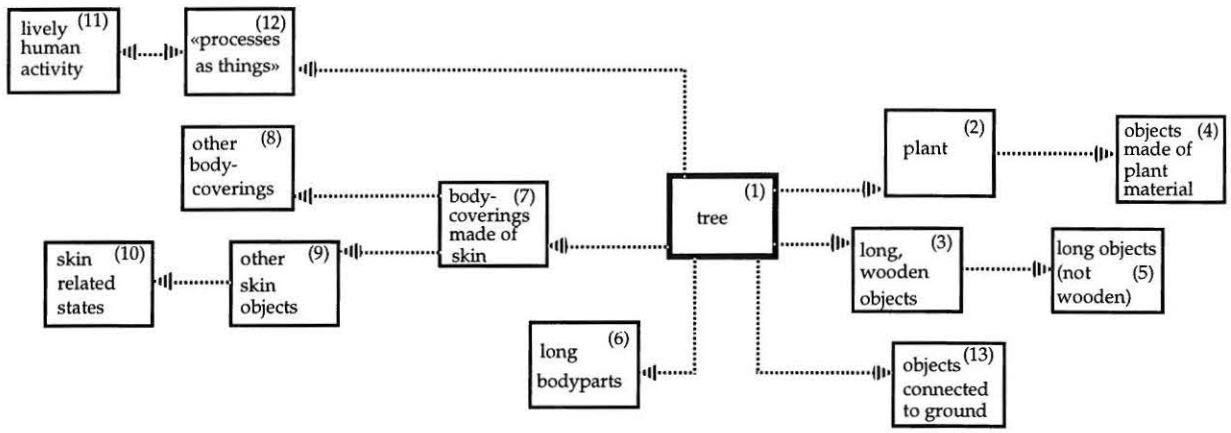

figure 4

Adding the instantiation relationships based on the class schema 'living', this figure is produced:

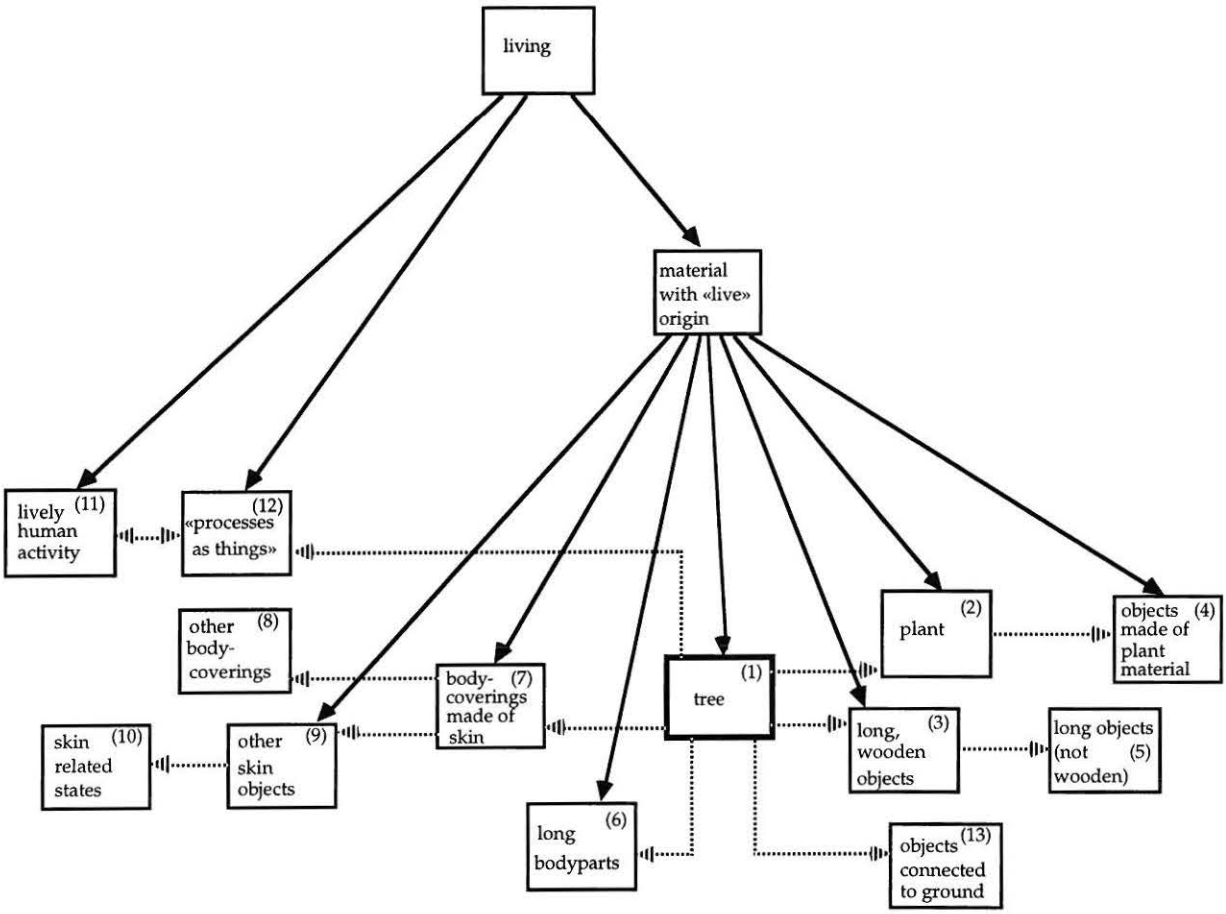

figure 5

The next figure shows the instantiations based on the class schema 'long'. Although only few schemas instantiate this schema, it entails a large portion of the class 3 concepts in this network (between 45 and 66 % depending on how large portion of the schema 'plant' that can be considered 'long').

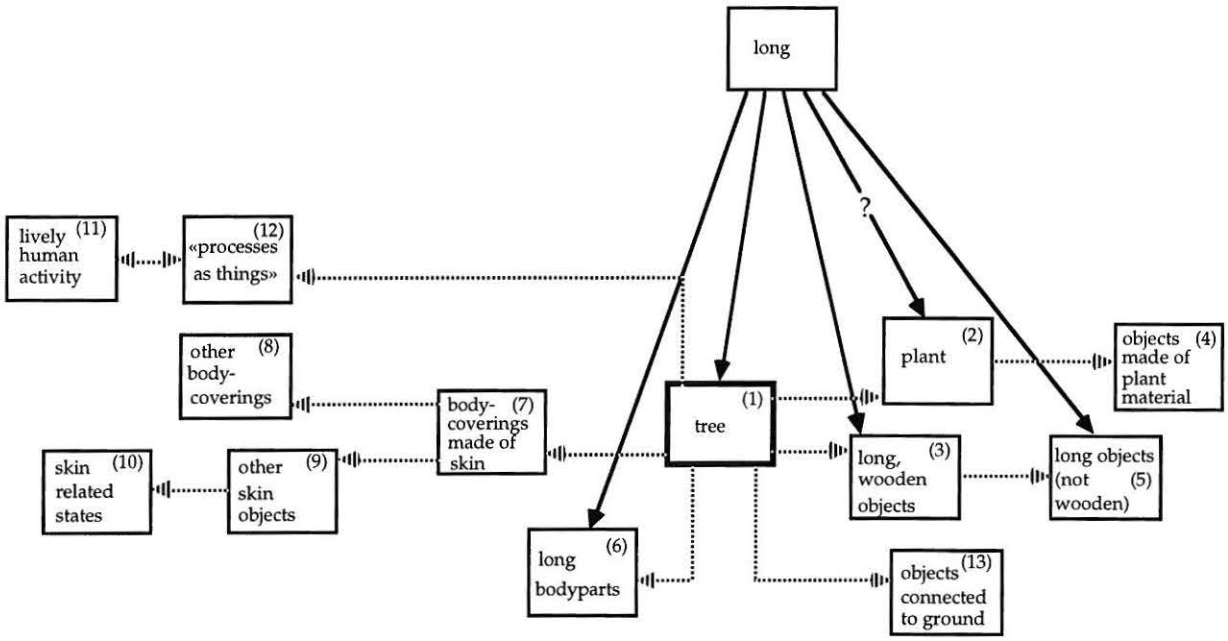

figure 6

(1) The prototype: trees

In my noun sample 37% of the nouns in this class refer to trees and other plants (if we leave out pure abstracts and animals). Tree names, as the ones below, constitute the largest subpart within this group (42%).

mokošo	a white thorn tree; (Acacia albida)[15]
mooka	a species of thorn tree; (Acacia karoo)
morukudu	tambuti tree; *Spirostachus africana*
mosêtlha	a species of acacia tree; (Peltophorum africanum)
mosu	camel-thorn; Acacia giraffe

As described for other Bantu languages, trees constitute a highly productive semantic category within class 3; almost invariably new loan words referring to trees are incorporated into this class. This is rather remarkable considering the

15 Unless something else is stated, the English translations are those provided by the dictionary (Matumo 1993)

fact that other loan words tend to fall into «default classes» usually lacking a noun prefix (class 9 in Setswana), or to connect with the phonologically most relevant class based on similarity between the class prefix and the loan word's first syllable.

I see 'tree' as the prototypical schema for class 3, as it forms the basis for metaphorical or metonymical extensions to most other concepts in the class. The class schemas that can be extracted from the network of extensions, reflecting the connections between the prototype and the rest of the other groups in the network, are: 'long' and 'living' (with the further elaboration 'material with «live» origin').

It is a peculiar fact, however, that the most frequently used generic term for tree is *setlhare* , a class 7 noun. One would perhaps expect it to be a class 3 noun, as are almost all the names for specific trees. However, in most other Bantu languages 'tree' is a class 3 noun (e.g. Kiswahili: *mti* , Zulu: *umuthi*), and Setswana also have at least one class 3 term for tree, although it is not frequently used (*more*).[16]

(2) Other plants

As exemplified below, class 3 also contains a lot of other plants (bushes, grass, creepers, herbs etc.), as well as some parts of plants.

mmodula	the flower on a corn stalk; the outer and loose husk that clings to corn
mofikapitse	a species of creeping plant
mogarugaru	a species of river grass
mogokang	a hooked thorn bush that grows in sandy places
moragangaka	a species of herb, used for healing

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16 Allowing oneself to speculate, one could perhaps suggest that there is a possible link between *setlhare* and class 7, based on another meaning of that noun: 'medicine'. As class 7 exhibits as an abstract schema 'participation in action', with 'instruments' («intermediary in action») as the prototype, the «action aspect» of trees (as «instruments of healing»: medicine) could perhaps link it to that class.

In western scientific terms, trees are often treated as a subgroup of 'plant'. There is, however, no reason to thrust such an 'expert category'[17] on a semantic network that is supposed to reflect the generalisations of «ordinary» language users, - not of skilled botanists.[18]

Within the semantic network of class 3, I therefore find it reasonable to treat plants other than trees, as extensions from the category 'tree' on the basis of their many similarities with trees. Plants, as well as trees, instantiate the schema 'material with «live» origin', which again instantiates the even more abstract class schema 'living'.

Many plants will also clearly instantiate the class schema 'long'. Most plants have long parts, but it would require a thourough study of Setswana flora to decide accurately which plants that one would perceive as «long gestalts». In the network I have reflected this uncertainty with a questionmark on the instantiation arrow from the class schema 'long' to the schema 'plant'.

(3) Long objects made of wood

These objects can also be regarded as semantic extensions from the prototype: The semantic relation between 'trees' and other 'long objects' is a metaphorical one, whereas the relation between 'trees' and other 'wooden objects' is synecdochical. Both relations are at work in connecting 'long, wooden objects' to the prototype of class 3. The semantic connection between this group of concepts and the prototype produces the two schemas 'long' and 'material with «live» origin'.

The following are examples of concepts belonging to this group:

morapa	a horizontal bar on two upright poles to hang blankets over
mosetshe	a peg
mosogole	a wooden beam
motshe	a pestle; a stamping stick

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17 Categories representing scientific models, or 'expert models' as described in Ungerer & Schmid (1996:52-5).

18 Both English and Norwegian dictionaries list two interpretations of 'plant': one «scientific» which includes trees ("any living organism that typically synthesises its food from inorganic substances, possesses cellulose cell walls, responds slowly and often permanently to a stimulus, lacks specialised sense organs and nervous system, and has no powers of locomotion"), and one which excludes them ("such an organism that is green, terrestrial, and *smaller than a shrub or tree*; a herb"). (My italics.) (Hanks, P. (ed.) *Collins English Dictionary* 1986:1173)

motswaisô	a firebrand; a torch; a partially burnt stump; a piece of charred wood; a stick from yesterday's fire

At least one language (Fulfulde, another Niger-Kongo language) has reserved a noun class exclusively for this conceptual group (the 'ngal-class') (Endresen 1993).

(4) Objects made of other plant material

The same type of semantic extension as that from 'trees' to 'wooden objects' in general (synecdoche), can be found from other 'plants' to 'objects made of plant material'.

As one can see from the examples below, this schema is a generalisation over a group of rather varied concepts. They do, however, share the schema 'material with «live» origin', which they also share with both the group of 'plants' and with the prototype 'tree'.

mhikwana	branch in gate to show that people are out
mmitsa	charm that attracts customers; a charm that attracts men; (a prostitute)[19]
morurêlô	a pot used for cooking medicines[20]
motlaagana	a temporary house; a house made of bushes; a tent; a tabernacle
mutlwane	a snare; a trap with a beam[21]

---

[19] Such charms would usually consist of plant material. The relation between the primary meaning and the term 'prostitute' could be one of metonymy; referring to the prostitute by using the word for a charm that she might wear to attract men. It is, however, equally possible that the charm and the prostitute independently have got their terms from the verb *go bitsa* (to call, cry out, draw attention to), which is the verbal basis for the derived noun *mmitsa*.

[20] This might not immediately look like a «member» of this conceptual group. It can, however, be argued that it is connected to the rest of the group by a metonymic relation «from content to container». The pot is associated with it's normal content, medicine, and medicines are produced from plant material.

[21] It may be made either of plant material, or of skin material (Prof. S.A. Swanepoel p.c.). In both cases it will be linked to the network and instantiate the abstract schema 'material with «live» origin'.

(5) Other long objects or phenomena (not wooden)

In addition to the long wooden objects, there are, as we can see below, some other long objects and phenomena of varying types in my noun sample.

Extending the network to entail these concepts, we see that we are leaving the «domain of trees and plants».[22] Hence, the similarity judgements are of a slightly more abstract kind.

I consider these concepts extensions from the group of 'long wooden objects', as they instantiate the class schema 'long', but are not connected to the 'living' schema.

moeme	erect pointing, or erect thing; a name sometimes given to a *modimako*, or tall pole with black and white stripes, and crowned with civet cat tail that stands in the centre of the Bogwêra camp at the second initiation[23]
mothaladi	a stripe in colours; a streak between clouds; a scrap of porridge left in a pot
mothalô	line
motontonyane	thin long bucket
motšhetšhedima	lane; traffic lane

The metaphor «a tree is a body»

So far we have been concerned with schemas whose similarities to the prototype is rather obvious (except perhaps the 'long objects' that are not made of wood or plant material).

There is another «cluster» of schemas, all related to the *human body* in different ways. The connection of these schemas to the prototype needs some comments.

Many languages exhibit a conceptual connection between trees and the human body, for instance by using similar terms to refer to either a part of a body or a part of a tree. In English the term 'trunk' can refer to the human torso as well as to the 'woody stem' of a tree. In Setswana *thupa* refers either to a small twig, or to the penis, *matlhare* usually means leaves, but can also mean body-covering

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[22] 'domain' in the sense used in Langacker 1987.

[23] This noun comes close to being «maximally schematic»; it doesn't necessarily refer to anything specific, but to any upright or erect thing. Such a thing is by necessity 'long'. The noun is a nominalisation, based on the verb *go êma* - to stand.

(although not in every day use). One can also in some languages (including Setswana), refer to different parts of a tree by using body part terminology; *tlhogo ya setlhare* - the head of a tree, *molala wa setlhare* - the neck of a tree, *legetlha la setlhare* - the shoulder of a tree, *mpa ya setlhare* - the stomach of a tree, *leoto la setlhare* - the leg of a tree. It is not difficult to grasp such meanings, even for speakers of languages that don't make use of such a metaphorical connection between parts of a tree and parts of a body.

I suggest that the reason for the intuitive understanding of such terms must be that humans easily construe the similarities between bodies and trees; such a metaphor is felt to be «natural». But it is not only a cluster of characteristics that makes us perceive this similarity. Rather, the whole 'gestalt' (the «perceived whole»; cf. Ungerer & Schmid 1996:33-7) of a tree is perceived as similar to that of a body. Both trees and bodies are long, erect objects that are organically alive, that have an outer cover (bark or skin), and that have different parts branching off from a central «trunk».

Keeping class 3 out of the discussion for a moment, it seems reasonable on a general basis to assume that the starting point for extension in the metaphorical connection between trees and bodies is *bodies*. In accordance with assumptions about the «bodily basis of meaning» (cf. Lakoff 1987, Johnson 1987) one can argue that it is «natural» for humans to bring primary bodily experience into their conceptualisation. Hence, seeing a tree as a body, could be a more basic (in the sense: more usual, as well as developmental prior) direction of extension, than seeing a body as a tree. As an example of this direction of comparison we have already seen that Setswana employ body part terms on trees.

I have already introduced several reasons to suggest that the «class prototype» in class 3 is 'tree'. The metaphorical connection between trees and bodies are clearly present in the semantic network of class 3, and with the central position of trees in class 3, I find it reasonable to propose that the direction of the extension relationship here is from trees to bodies, and through that relationship, further on to other concepts linked in different ways to bodies.

All arguments (productivity, number of terms, saliency) suggest that class 3 is a «tree-class» and not a «body-class».

The class 3 concepts that show a semantic connection to the human body, can be grouped as follows: 'long body parts', 'body-coverings made of skin', 'other body-coverings', 'other skin made objects', and sicknesses or special 'states of the skin' of human bodies. The term for 'body' itself - *mmele* - is also a member of this class.

Concerning the graphical representations of the networks, we see now that the extension arrows can be qualitatively different, depending on whether or not the schemas connected by extension belong to the same semantic domain or not, and in cases of extension from one domain to another: on how qualitatively different the two involved domains are.

(6) Long body parts

Long body parts of course instantiate the class schema 'long' that they share with the prototype 'tree'. They also instantiate the schema 'material with «live» origin', which is an elaboration of the more generalised class schema 'living'. The long body parts represent metaphorical extensions from the prototype on the basis of conceived similarities between trees and the human body.

The following are examples from my noun sample:

mmôpô	the bridge of the nose; the muzzle of an animal
moêlêdi	a navel cord
mokwatla	the back; the spine; a backbone
molêtsê	a leg
monô	a thumb

(7) Body-coverings made of skin

The next extension from the prototype is also based on the metaphorical relationship between trees and bodies; trees have *bark* as their outer covering, while bodies have *skin*. And a body-covering is easily conceived metaphorically as the «*skin* of the bearer», that is: as a part of the body. A second connection to 'body' is established by a synecdochical «part for whole» relation type, as these objects are *made of skin* (skin is part of a body).

The group instantiates 'material with «live» origin', that is a further elaboration of the class schema 'living'.

The following skin-made body-coverings were found in my noun sample:

moitlamô	girdle; waistband; belt; sash
mothikga	ornamental skin clothes
motlokolo	goat-skin apron, for girls and women worn over their buttocks
motsetô	traditional leather strip worn by men through loins and buttock; napkin

From this group two other small (in numbers) extensions can be drawn:

(8) Other body-coverings

This small group consisting of the three nouns listed below, resembles the previous one; the only difference is the lack of synecdochical relation to 'body' through 'skin'. But body-coverings are still metaphorically connected to 'body', even if not instantiating the schema 'material with «live» origin' itself, as the former group does. Rather it shares the local schema - 'body covering' - with that group. The local schema can be represented like the one below and integrated into the larger network figure:[24]

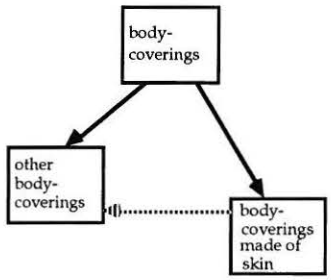

figure 7

mofitshana	a plain iron ring worn on the wrist
moitshômêlô	armour; protective clothing
motlopô	a tortoise-shell;[25] (clitoris)

(9) Other objects made of skin

Here it is the synecdochical relation to 'body' through 'skin' that motivates the connection to the network, and the group instantiates the schema 'material with «live» origin'.

The following are examples of this group of concepts:

mofalô	a small skin water-bag
mogogorwana	a dummy calf made of skin, stuffed with grass; a dummy calf that is licked by a lactating cow whose own calf has died

---

[24] To emphasis that this figure is to be read as an integrated part of the greater class network, I have copied the relevant part (concerning the extension relationship). The lay-out of the figure therefore appears a bit strange. In the following I will present examples all local schemas in this way.

[25] This is reasonably interpreted as metaphorically related to skin.

mokobolwane	calfskin
mophanyane	chapped skin
moropane	a timbrel; tambourin[26]

(10) Skin related states (or sicknesses)

Metonymy based on spatial nearness is the basis for this further extension from skin made objects. This group (see the examples below) doesn't instantiate the schema 'material with «live» origin', but connects to two of its instantiations ('body-coverings made of skin' and 'other objects made of skin') by a 'local schema': 'related to skin'.

mmokwana	measels
mobipô	a weal; a swelling in which there is no fluid; or pus under the skin
mofufutsô	perspiration; sweat
mothopa	small boil
motshwa	an itchy eruption

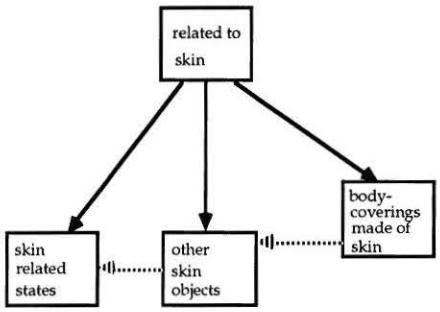

figure 8

(11) Lively human activities

The following nouns represent another group of concepts that seems rather uniform, and that corresponds to Spitulnik's concept 'lively human activities' (I have adopted her term.):

mminô	dance
moduduetso	applause; ululating, of a woman in a dance; yodelling, of a girl, or woman

---

26 This is actually made of *both* skin and plant material.

mogoḷokwane	ululation
moôpêlwane	the shouting, ululations and singing of a victorious army, choir, etc.
moteka	a merry noise; a feast

This schema represents a metaphorical extension from the class prototype into the «domain of human activities». The group connects to the prototype by instantiating the class schema 'living'.

We see now that the class schema 'living' exhibits a very high degree of abstractness: In this case 'living' refers to that «portion» of human activities that are particularly *lively*.

(12) «Processes as things»

The abstract schema 'living', as we have seen, encompass entities or phenomena that are associated with «live» origin, but also less concrete notions (cf. 'lively human activity').

Nouns that refer to a process constitute another group of «not concrete» concepts that I suggest is connected to the network. Many of these nouns are, as I have pointed out in the examples below, derived from verbs.

modiga	an end of a dispute, or discourse [*go diga* - to cast down; let fall]
moganô	a breaking up, or cessation of rain; time for resuming work after rain
mokgwasa	rustling; actual sound, as of something moving through twigs and foliage; (rumour)
mongatêgô	a fainting fit [*go ngatêgô* - to faint]
moônô	a snore; a grumbling; moan [*go ôna* - to moan; groan; snore]

This group of notions is suggested by Contini-Morava (1994:13) in her proposal for a class 3 network, and I share her opinion that, in describing a process as a thing, these nouns «fit well with the other liminal entities in this class, that fall somewhere between animate and inanimate». By describing a process or an event, they point not to a «dead object», but rather to an entity filled with movement, sound, or other characteristics of 'living' things. Thus, they instantiate the class schema 'living'.

(13) Objects connected to ground

Spitulnik (1987:58) argues that in ChiBemba there is a connection between trees (that are linked to the ground by their roots) and other things that are dug *in* the ground. My data (see the examples) also suggest a metaphorical extension from trees to such a group, connected by the following local schema: 'in ground'.

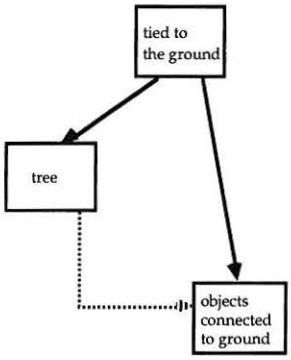

figure 9

mogobodi	a straight burrow
molala-thakadu	an antbear hole, or lair
motlhobodika	a large vent of an antheap
motlhodi	the eye of a fountain
motlôbô	a pit, or quarry; a place where clay for pottery, or *sebilô*, is dug; a storage place

It is possible that most nouns in this group in addition instantiate the class schema 'long' as well, reflecting yet another connection to the class network. (I have, however, not integrated this possibility into the graphical representation of the network.)

Concluding remarks to the class 3 network

The semantics of class 3 doesn't seem to represent the great confusion that one might be led to believe, by those who see the Bantu noun classes as formal classes only. As we have seen, my suggested network produces 'tree' as the prototype. Both Spitulnik (1987) and Contini-Morava (1994) also explicitly give trees a prototype position within class 3 (for ChiBemba and Kiswahili respectively).[27] They label their most abstract generalizations: "potent/living" (Spitulnik) and "entities with vitality (neither human nor prototypically animal)" (Contini-

[27] Contini-Morava uses the label 'most central subcategory', a notion that I interpret as 'prototype'.

Morava). I consider their suggestions compatible with my own most abstract schema 'living'. The «old bantuists», Torrend (1891) and Meinhof (1906), also appreciate the 'living' (- but «not personified») character of the members of this class. Denny and Creider's (1986) contribution differs, as they focus on the configurational aspect of this class' members: 'extended'. Their «class 3 meaning» resembles my schema 'long', but they defocus the possible 'living' character of the class.[28] However, by drawing attention to the configurational aspect, they have extracted an important property of a substantial amount of class 3 nouns (including the prototype). With the exception of Contini-Morava (1994), all the others either miss this point completely, or only vaguely hint towards it.[29] Batibo (1987) offers yet another interpretation of the semantics in this class, but even that focuses on an important aspect of trees: that they are "planted".

It is my impression that the semantics in class 3 is a lot easier to reveal than some of the other so called «miscellaneous» classes. This is, I think, due to two circumstances. Firstly, it seems that there is less variation between different Bantu languages regarding the selection of nouns that the class contains.[30] Secondly, I assume that it is of importance that the prototype in this class is exceptionally strong; trees constitute a large and very salient and homogeneous group, and is about the only group of nouns that is almost completely productive in incorporating every new term introduced to the language.

Accordingly, we see that those who have investigated the semantics of class 3 (myself included), bring forward semantic descriptions that are largely compatible.

Rather than revealing any «new» semantic groups, my own contribution to the understanding of class 3 is: establishing a network that explicitly suggests meaning relations between different groups of notions and commenting on the nature of these relations, as well as positing the abstract generalisations (schemas) that bind the parts of the network together.

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[28] They only very loosely mention that class 3 "may constitute a class for plants on the kind side of the system" (Denny and Creider 1986:223).

[29] As Torrend (1891:79) does, when he mentions "such tools or artificial objects *as remind one of the form of a tree* [...]" (My italic.)

[30] This impression base on the data used as illustrations by the authors that I refer to.

4.3. Class 5

In this section (4.3) I propose that the semantics of class 5 exhibits a network of extensions related to a possible prototype 'fruit', leading to the two internally unrelated class schemas: 'non-individuability' and 'roundish'.
That implies that as far as configuration is concerned, the majority of concepts in class 5 oppose the majority of class 3 concepts.

Earlier treatments of the semantics of Bantu class 5

Class 5 in Setswana is one of the semantically least transparent classes. Cole (1955:79) again makes use of the term «miscellaneous» for a description of its content. He treats class 5 and 6 together (class 6 consists partly of the plural counterparts of class 5 nouns, but also of a great number of uncountable nouns), and comes forward with the following list of concepts as the content of the classes 5/6: "names of parts of the body, animals, plants, natural phenomena, some collective nouns, and a number of personal nouns". All these concepts, with the exception of collective nouns (which clearly belong only to class 6), are listed again in his treatment of several other classes.

As the following short presentation will show, the search for a core meaning of class 5 has led to rather different suggestions.

Torrend (1891:91-2) in his treatment of class 5 centres on the notions of "unproductive", "hard, or bare, or flat". The rest of his treatment of class 5 is rather fragmentary; he merely lists selected nouns, or groups of nouns, from the class, leaving the impression that those nouns in some way or another are more central to the class than the not mentioned ones. He, however, makes no attempt to interlink them. The groups of nouns that he emphasises are still, as we will see, present in class 5 in contemporary Setswana: fruits, the sun/the day, and "words and distinct sounds".

Meinhof (1906:9) treats class 5 as the singular counterpart of class 6, which he sees as "ursprünglich dualisch" (originally dualic).

Denny & Creider (1986:220-1) argues that Proto Bantu class 5 belongs to the group of configurational classes. Class 5 is described as consisting of "non-extended, solid figure units". According to Denny & Creider 'non-extended' may

be "negatively characterised as not extended[31], and is positively characterised as rounded, protruded, humped, bunched, etc." They add, however, that it is possible that class 5 additionally incorporates a few nouns on the basis of 'kind' rather than 'configuration'. When focusing on 'kind', they suggest that class 5 is the class for fruits, or in a more general sense: "typical products taken for human use from plants without regard to their configuration".

Batibo (1987:13) argues that class 5 consists of objects "usually existing in pairs or identical forms".

Spitulnik (1987:62) treats class 5 and 6 together. She claims that in ChiBemba both the classes 5/6 (the singular nouns in class 5 and their plural counterparts in class 6) and the non-count class 6 nouns "center around the related notions of 'non-individuability', 'collectivity' and 'abundance' [...]. Although their semantics differ only minimally, these two classes have been given separate designations because there are a sizeable number of nouns which are non-count and occur exclusively in Cl. 6. Some singular forms of Cl. 5 are back-formations of Cl. 6 mass nouns, but typically the count nouns of Cl. 5/6 denote fruits, paired items (especially paired body parts), and constituents of groups."

Contini-Morava (in an updated version of her work found on Internet, 1996) argues that the most productive semantic category within class 5 consists of fruit terms, and that fruits constitute the basis for several semantic extensions, particularly concerning shape and size. She states that the majority of fruits are 3-dimensional, round, large[32], and that it is possible to conceive of them either as solid objects or as containers. On this basis she suggests the following semantic extensions: protrusions, swellings, lumpy substances, 3-dimensional containers, and hollow spaces. She then proposes a more abstract extension: from growth/swelling and containment to large things in general. (In Kiswahili, class 5 can be used to derive augmentatives.) As a 'superschema' for the class, Contini-Morava suggests 'plant offspring', based on the two instantiations 'fruit' and

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31 They define "extended" as: "characterised by relative length in one dimension at the expense of the other two, or less often, by relative length in two dimensions at the expense of the third". (Denny and Creider 1986:220)

32 She admits that treating fruits as large objects might seem counterintuitive, but claims that it can be justified, because "[f]ruits are «large» in relation to their earlier stages of growth, and it is when they become large that they are of most value to humans". (Contini-Morava on Internet, 1996)

'leaves'. The extensions from 'fruit' have already been mentioned, and the extensions from 'leaves' are: 'curved flat objects', 'things with broad parts', and 'curved outlines'.

It seems then, that the semantics of Bantu class 5 is a lot more complex than that of class 3. A possible explanation could be that class 5 exhibits greater variability in semantic content between the different Bantu languages (for historical or other reasons). It is, however, equally possible that this apparent variability rather demonstrates a semantic complexity, and that most authors by their preconceived notions about *core meanings*, have been led to pick out one single aspect among several possible ones.

The different semantic core meanings proposed above, can be summarised as: dual, non-individual, unproductive, non-extended, and the most frequently mentioned group of items that belong to class 5 (in almost all Bantu languages), is: fruit.

Proposal for a schematic network of class 5

My own suggestion is that the semantic network of class 5 produces *both* a class schema for *'non-individuated'* (with «duality» as one further elaboration) and a class schema representing the configuration *'roundish'*. 'Fruit', but also a lot of other concepts can be characterised as being instantiations of both these schemas.

By 'non-individuated' objects I refer to:

1) objects that normally occur as 'one of a «multitude»'. A multitude is here defined as a group of three or more items (typically *very many*) of the same 'kind' and of more or less the same shape.

2) objects that normally occur as 'one of a pair'.

'Roundish' objects in the sense that I will use here, need not be perfectly globular or circular. They contrast with long objects by being of relatively similar lengths in all relevant dimensions.

The abstract concept 'non-individuated' is clearly more difficult to handle than a configurational concept like 'roundish'. 'Non-individuability' depends, to an even greater degree, on the viewer's subjective conceptualisation or «focal attention» (cf. Langacker 1987).

A third aspect of the class 5 semantics is that the majority of concrete, touchable objects consist of «deader material» than their more «live» counterparts in class 3. This might constitute a second striking opposition between these two classes. (The first opposition is based upon the configurational

contrast 'long' vs. 'roundish'.) I have, however, not integrated this «non-live» aspect in the network figure, the main reason being of a practical nature: I would have to split many of the «schema-boxes» further, leading to a network figure that would be hard to comprehend. That does not imply that I do not appreciate the possibly relevant status of an abstract schema: 'non-live objects'. I will, however, suggest that since the proposed class prototype does not reflect the notion of 'non-live objects' it is probably not as central as the two class schemas that I have integrated in the proposal for a class 5 network.

The network of extensions that I suggest for class 5, could be graphically represented as follows:

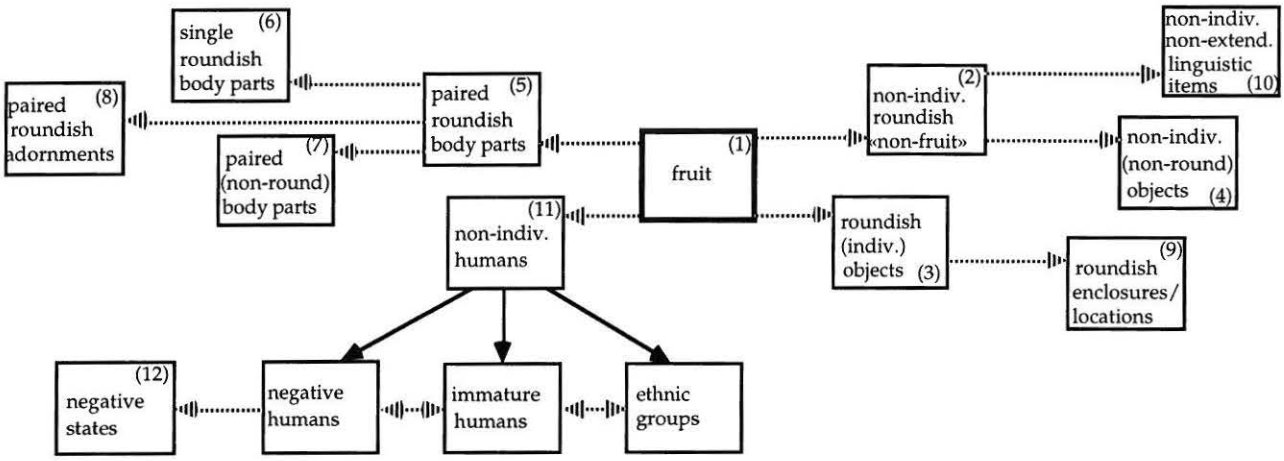

figure 10

Again the instantiation relationships are shown in two different figures to avoid a graphical representation that is virtually impossible to read. They are, of course, to be read as different parts of one unified representation.

First, I show the instantiations based on the schema for 'non-individuated':

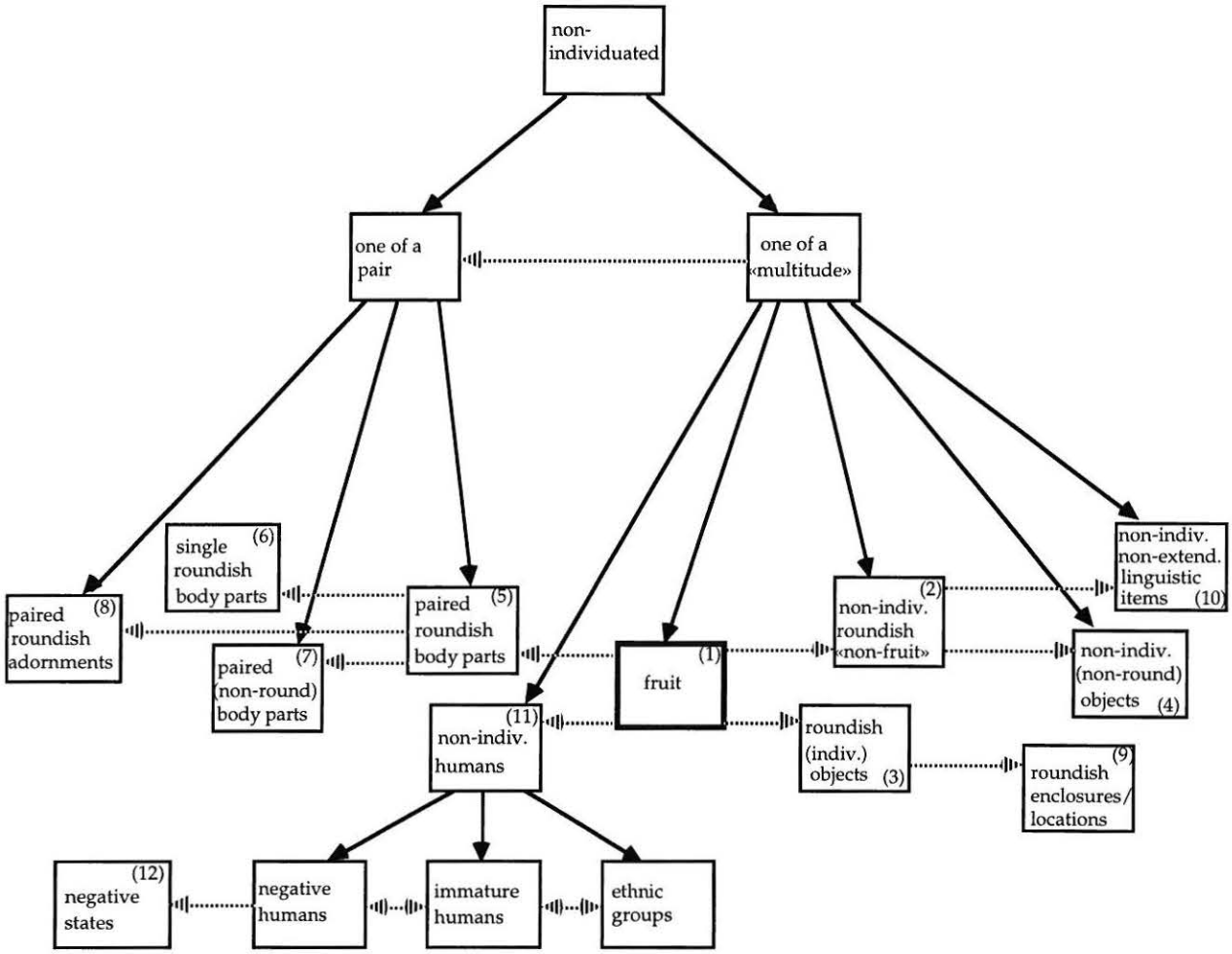

figure 11

The second representation show the instantiations of the schema 'roundish':

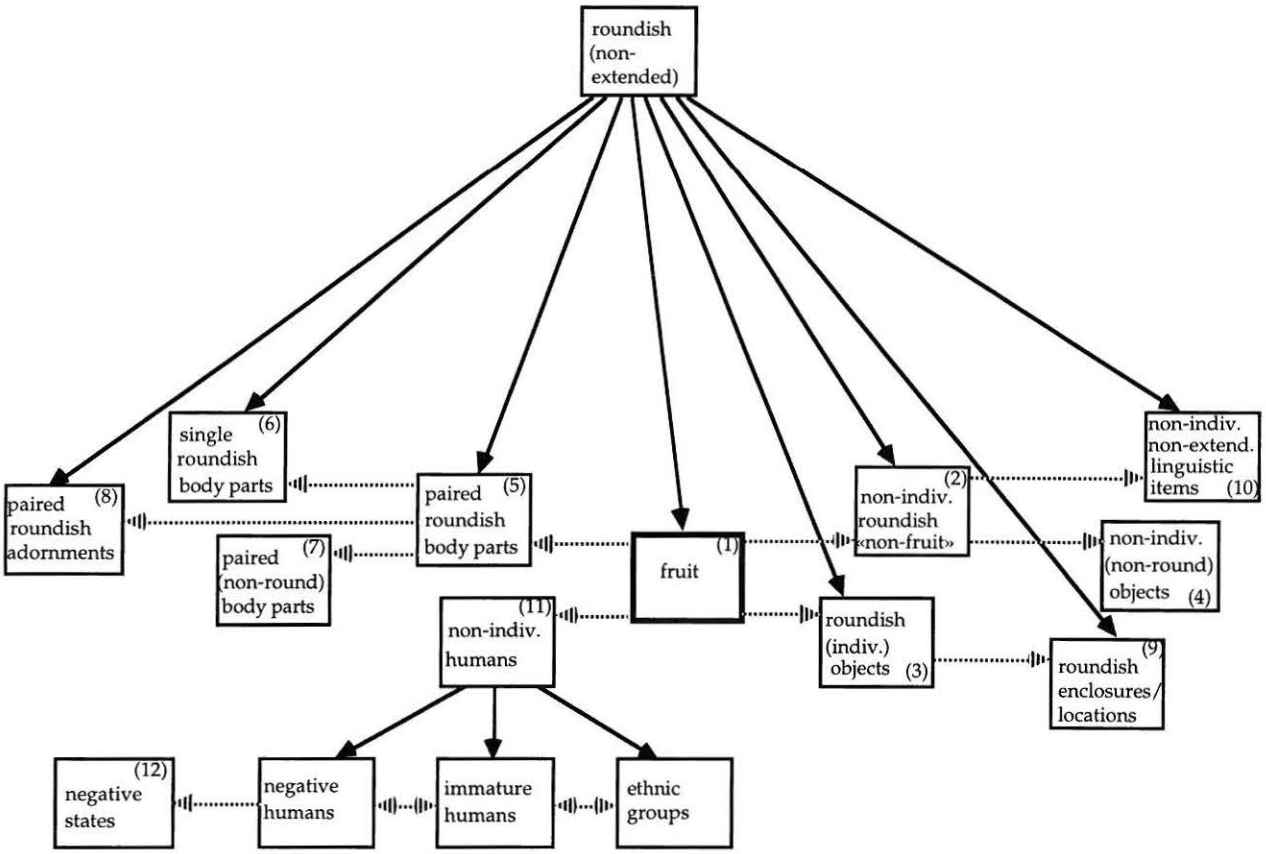

figure 12

(1) Fruit: a possible prototype for class 5

As a prototype, 'fruit' is not as clear as the prototype in class 3. Actually, the main reason for suggesting that it is possible to treat it as a prototype at all, is that evidence from other Bantu languages (including the reconstructed Proto-Bantu), indicates that fruit names have always been in class 5, and that there is a regular relationship between trees/plants in class 3 and fruits in class 5: fruit names will often have the same stem as the trees or plants that they grow on, the only difference being the noun class prefix: *morula* is the class 3 noun for a «morula-tree», and *lerula* is the class 5 noun for a «morula-fruit».

In Setswana all the indigenous fruits, as those listed below, have class 5 names. That indicates a former productivity. Hence, it is possible that the group of fruits has been more «saliently present» in class 5 at an earlier stage of history.

legapu	water-melon
legomane	a species of pumpkin

lekwele	an edible tuber; a table potato
lephutse	pumpkin
lerôtsê	a melon; a melon that is not of the sweet species

In contemporary Setswana class 9 has absorbed most of the «modern» fruits imported to the area. The names of these imported fruits have been treated like many other loan words. They have been placed in the prefix-less class (9), where they keep the original first syllable (or only modified in accordance with Setswana phonotactics) without adding a class prefix. This gives *apolê* for apple, *panana* for banana, *pere* for pear etc. It is, however, possible to add the class 5 prefix to at least two of these «new» fruit names, namely apple (*leapolê*) and banana (*lepanana*), thus indicating quite recent productivity. This fact together with the fact that almost all Bantu languages assign fruits to class 5, strengthens the impression of this class as the «fruit class», despite the fact that the fruits in class 9 might outnumber the ones in class 5 in contemporary Setswana.

I include tubers, bulbs and other fruit-like plant products in the 'fruit' term (the biological, as well as the English or Norwegian definition of fruit is of course irrelevant here).

'Fruit' is the starting point for several extensions. The similarity judgements between 'fruit' and the other extensions (that will be treated below) produces the two class schemas: 'non-individuated' and 'roundish'. 'Fruit' instantiate both of these schemas.

That does not imply of course that all fruits by necessity are round. Rather, it refers to a prototypical characteristic of fruits; the prototypical fruit is reasonably considered 'round', as are in fact the majority of the group as such.

(2) Other non-individuated, roundish objects («non-fruit»)

Class 5 also entails a lot of other roundish objects that normally occur together with several others of the same kind and of more or less the same shape. As such, they instantiate the same two class schemas that the prototype does. Hence, one could argue that the prototype should include this group as well, establishing a relationship like:

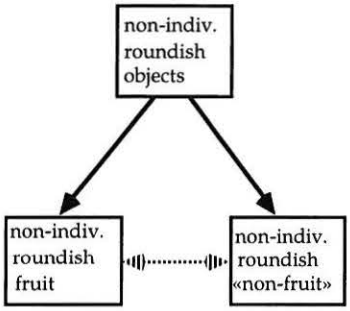

figure 13

- with the most abstract schema established as the class prototype from which the other extensions are drawn. However, it does not seem reasonable to suggest as prototype a concept that is as abstract as this, and that exhibits such a highly heterogeneous internal structure as the examples below show. Therefore, I have rather treated this group as an extension from the prototype 'fruit', sharing with it the two class schemas 'roundish' and 'non-individuated', but differing as far as «live» vs. «dead» material is concerned (in that most of these concepts are «deader» than fruits).

legwarane	a stone, tooth, etc., for rubbing skins
lekwakwa	a sharp-edged stone; a rough stone of volcanic formation
lelepa	a difficult or intricate knot; a puzzle; a riddle; a mystery[33]
lengope	a lump of porridge when badly stirred
lephoto	a knot in a stick, or piece of timber; a place in a branch, or reed where a twig has been cut off

(3) Other roundish (but individuated) objects

As the following examples show, class 5 also includes some concepts referring to roundish objects that can hardly be seen as instantiations of the schema 'one of a «multitude»'.

lefiswana	little pot
lekuka	a skin sack; a milk sack, made of skin (nowadays it may be made out of other materials). N.B. it is used for processing fresh milk into sour milk or *madila*

[33] The knot is the primary meaning. The other meanings are metaphorical extensions.

lesiba	the outer skin of a goat's bowel, and the musical instrument made from it[34]
letsatsi	the sun; a day; heat caused by the sun
letshêgô	a trivet, or three-legged stand for a pot, etc.: a stone etc. for a pot, or kettle to stand on to be boiled

These concepts relate to the prototype through extensions, and represent instantiations of the class schema 'round'.

(4) Other non-individuated (but «non-round») objects

This group of concepts represents yet another extension from the prototype. It represents an instantiation of the schema 'one of a «multitude»', and thereby also the class schema 'non-individuability'. The following are examples from this group:

lekala	department[35]
lerapô	bone
letlepu	mirth; plentitude of food, or any other material possessions; abundance, especially of food
letlhomaganyane	a small seam in a kaross[36]
leudi	a speck; a shred, as of a blanket

(5) Paired, roundish parts of the body

Paired (or dual) objects represent a special case of 'non-individuability'. It is when we are confronted with these concepts, that we see that the schema 'one of a «multitude»' is not general or abstract enough to constitute the class schema (as *two* hardly can be considered a «multitude»). The need therefore arises for establishing the more abstract class schema: 'non-individuated'.

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[34] The secondary meaning representing a case of synecdoche.

[35] This meaning represents a metaphorical extension from the more basic meaning 'branch' (not given in the dictionary). 'Non-individuability' is a relevant aspect both of the primary meaning and of this extension, as 'department' is meaningful only on the «background» that there exist *several*.

[36] A seam consists of many small identical stitches.

Most body parts in class 5, as the ones below, are easily described as instantiations of both the schemas 'paired' and 'roundish'. They represent yet another extension from the prototypical group.

lerago	a buttock
lerêtê	testis; scrotum
lethêka	waist; loin
letswafo	a lung
letswele	a fist; a small compact group of people[37]

The following three small (in numbers) groups of concepts are easily related to the group of 'paired, roundish body parts' by extension:

(6) Single, roundish body parts
Only one body part from my class 5 sample *letlaparapelo* - 'pericardium', is not paired. Its configuration, however, is clearly 'roundish'.

(7) Paired, «non-round» body parts
A couple of other body parts from my sample can hardly be considered 'roundish', but do represent instantiations of the schema 'one of a pair':

lefuka	a pinion; a wing; a feather
lesufu	a thighbone or upper leg bone of an animal or human being; the upper arm bone
letlhakore	flank; side

(8) Paired, roundish body-adornments
This extension differs from the two above: It shares with the group of 'paired, roundish body parts' all its instantiation relationships, but differs by representing concrete objects *attached to the body*, rather than being parts of the body itself. As such, the following concepts represent metonymic relationships based on «spatial nearness» to the 'paired, roundish body parts'.

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[37] The fist is the primary meaning. The secondary meaning is an example of a metaphorical extension.

lenyena	an ear-ring
lesêka	a bangle or bracelet; formerly a twisted metal ring worn on the arm and below the knee; a leg ornament; a coiled spring

(9) Roundish enclosures or locations

These notions are indirectly linked to the prototype through extensions. I have treated them as extensions from the group of roundish, but individuated objects, which itself is an extension from the prototype. The roundish enclosures and locations instantiate the schema 'round'. The entities that these concepts refer to, differ from the groups of entities treated above, in the way human beings deal with them: They are not three-dimensional, «manipulable» objects that we can hold in our hands, but either two-dimensional locations or three-dimensional enclosures. The roundish shape could be either concrete or imagined. The following are examples from this group of concepts:

ledutêla	a pond or pool in the veld; a waterhole in the veld
lefatshe	a country; a land; a state; the earth; the world
legotlhe	universe[38]
lelapa	a low wall or enclosure in a home; a home; a family[39]
letšha	a pan, or shallow lake; a vlei, a saltpan

It is, however, possible that one should connect these concepts to the schema for 'non-individuability' as well, on the basis that they could be conceived as «containing» non-individuated entities; either an unspecified number of human beings (often a «multitude"), or the mass entity, water. In that case one should perhaps rather treat this group as a direct extension from the prototype.

(10) Non-extended (in the domain of time), non-individuated «linguistic items»

Formal grammatical terms and some other linguistic phenomena occur in class 5, as for example the following:

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[38] Probably perceived as a kind of roundish, huge enclosure (three-dimensional) or location (two-dimensional).

[39] The enclosing wall is the primary meaning. When referring to a home or a family *lelapa* is a metonym based on «spatial nearness».

lebitsô	a name; a nomenclature
lediri	a verb
lentswe	a voice; a word; the sound of a voice
leselô	noun
letlhaodi	adjective

The «new» formal terms are probably analogies based on the earlier existing vocabulary concerning parts of language or sounds. The striking difference between these language related phenomena and the language related phenomena in other classes, is that the class 5 group mostly consists of characterisations of *single* words or sounds (of a short duration), whereas concepts referring to more enduring language events are found in other classes; e.g. *polêlô* - 'a tale' (class 9), *morapêlô* - 'a prayer' (class 3), *tlhamane* - 'a fairy tale' (class 9).

The link between this group of concepts and the other concepts in class 5 is based on a metaphorical extension from the configurational opposition 'roundish' vs. 'long' belonging to the three dimensional domain, to an opposition in the domain of time: short duration («non-extended» - or metaphorically: 'roundish' - in the domain of time) vs. endurance («extended» - or 'long' - in the domain of time). That makes this group an instantiation of the schema 'roundish'.

In addition these single sounds and word-types normally occur together with a «multitude» of other similar parts of language. This makes them much more related to 'non-individuated' concrete objects, than could possibly be said about the more enduring language phenomena like stories, prayers etc. In other words: this group can be perceived as still another instantiation of the class schema: 'non-individuated'.

To conclude: I have treated this group of concepts as a metaphorical extension from the 'non-individuated roundish objects' «that are not fruits»; both groups instantiate the two class schemas, but they differ in 'semantic domain'.

(11) Non-individuated human beings

At first sight one gets the impression that most human beings in class 5 are marked by negativity (*lefêlêpa* - a cheat; a rogue) or immaturity (*lesokgola* - a child just able to run about). However, the names of many ethnic groups (except the Batswana themselves and a few others) are also found in this class; it is not uncommon to integrate «new» groups that have not had a Setswana term, into this class rather than into «the human class 1». This works even for distant and unrelated groups that the Batswana hardly could have been in a position to develop a negative

attitude towards.[40] I thus find it more likely that, rather than plain negativity, the notion of 'non-individuability' is the origin of the class 5 human terms: One could argue that there is a human tendency to perceive people from other ethnic groups, people with negative or scary qualities and the not fully grown and mature in a de-individuated manner. The following are examples of «class 5 persons»:

lefêlêpa	a cheat; a rogue
lekgôba	a slave; a member of a slave family
Lekhalate	a coloured; a person of mixed blood in Southern Africa[41]
lesokgola	a child just able to run about
letagwa	a drunkard

In the network figure I have represented 'ethnic groups', 'immature humans', and 'negative humans' as three further elaborations of the schema 'non-individuated human beings'.

(12) Negative states

A group of relatively homogeneous abstract concepts (homogeneous in the sense of centring around a notion of «negativity» or «undesirability») constitutes the last group of concepts that I have integrated into the class 5 network. (See the examples.)

lebêkêbêkê	starvation
lehuma	poverty; great sorrow; damage; loss
leitlhapêlô	riotous mirth[42]
lenyôra	thirst
lesotlô	contempt; mockery

Although I have established 'non-individuability' as the generalisation over the humans in class 5, we have also seen that «negativity» easily suggests itself as part of the immediate associations for many of these terms. That is, of course, not

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[40] Dr. Joseph Tsonope p.c.

[41] This is a borrowing from English, with the class 5 prefix attached to it.

[42] This notion is considered negative because it is associated to being drunk (Prof. S.A. Swanepoel p.c.).

a contradiction: The tendency to treat some humans in a «de-individuated» manner, easily leads to negative associations. This negative aspect could provide a further extension to negative states that humans might experience, leading to the local schema: 'negativity'.

The 'local schema' connecting «negatively marked human beings» and the negative states can be represented as follows (and should, of course, be «read into» the schematised class network):

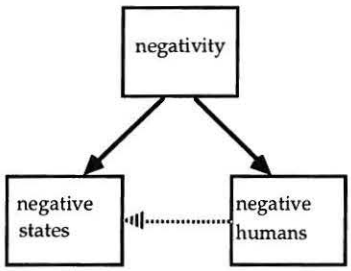

figure 14

Concluding discussion of the proposed network for class 5:

My proposal for a semantic network of class 5 in Setswana actually incorporates several of the notions that have been suggested as the semantic core of class 5 in various Bantu languages and by various authors. Torrend's (1891) notion *"unproductive"* seems to focus on the «non-live» character of a lot of this class' members as opposed to many class 3 members (proposed here as a possible additional abstract schema entailing many class 5 concepts).

Meinhof (1906) argues that *duality* was the original concept of both class 5 and 6. He goes to great lengths in trying to combine the notion of duality with the indisputable fact that fruits are class 5 concepts. As mentioned in chapter 2, he states that "Früchte zerfallen entweder von selbst in zwei Teile oder werden vom Menschen, *da er zwei Hände hat*, regelmäßig in zwei Teile zerlegt".[43] (My italic.) Within my proposed network of interrelated concepts, nothing suggests such a *direct* link between paired objects and fruit. Rather, the two groups of concepts are connected by sharing the rather abstract class schema 'non-individuated'.

Batibo's (1987) statement that the original Bantu class 5 concept was *"existing in pairs or identical forms"*, is also compatible with part of my suggested network; it

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[43] In English translation: "Fruits either divide into two parts by themselves, or are regularly divided into two parts by humans, *because they have two hands.*"

coincides with the schemas 'one of a pair' and 'one of a «multitude»', which together compose the more abstract schema 'non-individuated'.

Although Denny and Creider (1986) feel the need to mention *fruit* specifically, and thereby suggesting that class 5 might exhibit an aspect of «kind semantics», they emphasise the configurational aspects of this class, giving the label *"non-extended, solid figure units"* to its members. As opposed to Meinhof and Batibo, who focus on 'duality' and 'non-individuability' (as I interpret them), Denny and Creider focus on what I have treated as *another* abstract schema within class 5: the configurational concept 'roundish'.

A possible explanation to this diversity could be that the different suggestions only reflect a situation where class 5 has developed in different directions in different Bantu languages. However, Meinhof (1906), Batibo (1987) and Denny and Creider (1986) all base their analyses on Proto Bantu material. So they have, I believe, «seen different things» within the same material, because they were restricted by the belief that there would be *one single core meaning* to detect. In my view, all of them point to groups of concepts from which one can extract important aspects of the semantics of contemporary Setswana class 5, but only to *parts* of it. As those parts are basically the same as the different abstract schemas in my suggested network, I consider this a support to my analysis.

On the basis that both class 5 and the non-count part of class 6 centre around the same notions of *non-individuability, collectivity and abundance*, Spitulnik (1987) gives the two classes a common treatment. (Meinhof 1906 also treats the two classes together, but based on the notion of duality.) I share her opinion that non-count nouns (which include physical masses and entities that to some extent is conceived in a «mass-like manner») indeed have something in common with 'non-individuated' entities.

Within the framework of my analysis this relationship could be represented as follows:

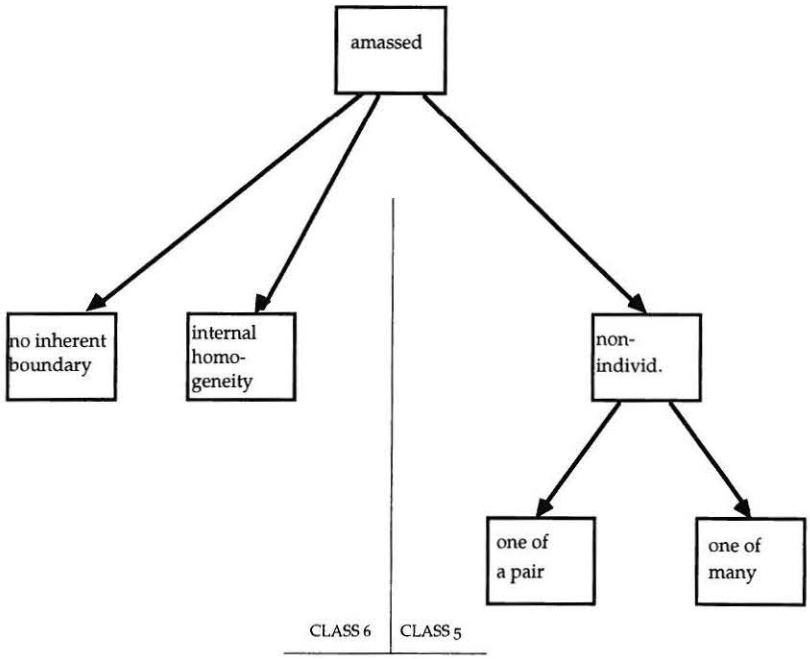

figure 15

Contini-Morava (on Internet 1996) points to the fact that in Kiswahili a lot of large things are included in class 5, and that "a noun stem normally associated with any of the other classes, if put in Class 5, aquires the connotation of large size". She suggests that it is the category 'fruit' that motivates the extension to large things, on the basis of associations of growth/swelling and containment, and that fruits can be conceived as «large» in relation to earlier stages of growth.

Concerning Setswana, there is absolutely nothing in my class 5 data that could suggest an extension to large things. On the contrary, a large portion of the class 5 concepts refer to *small* objects. (Small in the sense of easily manipulable, - in other words: small as compared to the human body.) As a matter of fact, I believe that a third class schema 'small' possibly should be integrated into the class 5 network together with the other two. I have, however, chosen not to do so, as I see the other two class schemas 'non-individuated' and 'roundish' as more fundamental for the understanding of the semantics of class 5.

It is of course not a problem that Kiswahili includes in class 5 a lot of concepts referring to large objects, while Setswana doesn't. But it represents a problem that Contini-Morava (1996) argues that fruits are conceived as «large», while I would argue that they are conceived as «small». We have no reason to

believe that speakers of these two closely related languages conceive fruits that differently.

Comparing Contini-Morava's examples with my own data, I find that except for the augmentative use of Kiswahili class 5, the types of concepts included in class 5 in the two languages to a large extent are of the same character. It seems therefore as if the only reason for suggesting that fruits are «large», is the augmentative use of class 5 in Kiswahili. If that is the case, such a solution seems forced on the data. I would rather suggest that 'large' might be an independent class schema ('superschema') in Kiswahili class 5, not necessarily connected to the prototype 'fruit'.

4.4. Class 6

In section 4.4 I will suggest that the non count nouns in class 6 have the schema 'liquids' as their prototype. The different extensions from the prototype reflect one (or both) of the characteristics of 'liquids': 'no inherent boundary' and 'internal homogeneity'. These characteristics are represented as the two class schemas in the schematic network of class 6.

Class 6 includes regular plural formations of roots occurring in the singular classes 5 and 14. In addition, the class exhibits a substantial number of class 6 nouns that don't have singular counterparts. It is the latter group of non count nouns that is the basis for the semantic analysis in this section. I will only briefly comment on the relation between the non count class 6 nouns and the count noun plurals of class 6.

Earlier treatments of the semantics of Bantu class 6

Cole (1955:81-2) divides these class 6 nouns that "are normally used in the plural only" in four categories: 1) "Basic collective nouns [...] mainly signifying liquid and semi-liquid substances." 2) "Collective nouns formed from stems normally appearing in other classes, [...] and signifying large numbers or aggregations of animals." 3) "Abstract or semi-abstract nouns." 4) "Nouns indicating times or seasons: Owing to their temporal significance, these function mainly as adverbs of time."

Torrend (1891:97-100) connects the "sub-class MA [class 6] without singular with the class BU-MA [classes 14/6] ". He states that "The substantives which have no other classifier than MA- are principally those of fluids or quasi-fluids, or again of things which melt naturally." He also mentions that "In several languages, principally in Chwana [Setswana], MA- is often used to express great number."

Meinhof (1906:8-9) claims that class 6 originally contained: 1) "*doppelt vorhandene* Dinge". The other semantic sub-groups he finds are described like this: 2) "Aus dem dualischen Sinn hat sich ein *kollektiver* entwickelt." 3) "Die *Flüssigkeiten* und ähnliche Stoffe gehen nach der *ma-* Klasse in der Regel ohne

Singular dazu." 4) "Aus der *kollektiven* Bedeutung ist die *abstrakte* abzuleiten."[44]

Denny and Creider (1986:218, 224-5) initially separate count nouns from mass nouns. They claim that: "Mass nouns constitute a separate subsystem which utilises some of the morphemes of the main (count noun) system, but which has sufficient semantic distinctness to justify its separate treatment." The class 6 mass nouns are held to be liquids and viscous substances. Class 6 nouns are also found in Denny and Creider's count noun system, on the configurational side, where they are supposed to represent *collections* of "non-extended solid figure" units. Most of these nouns would merely be the plural counterparts of class 5 nouns which are described as (single) *units* of "non-extended solid figure". But they also recognise the fact that class 6 "is often used to mark collective plurals, i.e., those where the units cohere together".

Batibo (1987:15) suggests "usually amassed" as the class 6 noun «label»: "Nouns in this category denote objects which are usually amassed together so that they are conceived as one entity. Most of such objects belong to non count nouns, especially liquids."

As mentioned in section 4.3, Spitulnik (1987:62) treats class 5 and 6 together, claiming that "their semantics differ only minimally". However she states that "[f]orms in class 6 which are not plurals of class 5 nouns (i.e. the non-count Cl. 6) denote masses, or augmented or collective versions of entities usually denoted by nouns of other classes."

All these treatments of this sub-group of class 6 seem to point to the centrality of liquids.[45] The collective meaning and the abstracts are also recognised by some. The only suggestion that clearly sets itself apart from the others, is Meinhof's (1906) "doppelt vorhandene Dinge". My data certainly don't support the inclusion of such a notion in the non count part of class 6. On the contrary, I share the other authors' opinions (as I interpret them), that liquid masses are very central to «non count class 6».

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[44] In English translation: 1) «doubled things» 2) From the dualic sense a *collective* has derived. 3) *Liquids* and similar substances fall into the *ma*-class, usually without a singular. 4) From the *collective* meaning the *abstract* is derived.

[45] Contini-Morava (1994 and 1996) does not include class 6 in her analyses of Kiswahili noun classes.

Proposal for a schematic network of class 6

The semantic network that I will propose in the following, includes the schema 'liquids' as prototype. 'Internal homogeneity' and 'no inherent boundary' are suggested as the two class schemas. These are abstract generalisations that, in addition to explicating the physical masses themselves, reflect important aspects of more peripheral groups that I will suggest are related to the prototype by extensions.

The extension relationships that I will suggest for class 6 may be represented as follows:

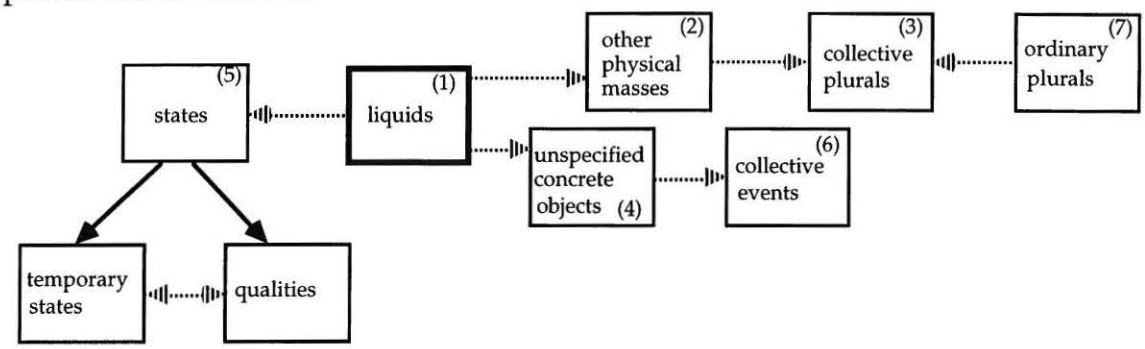

figure 16

The instantiation relationships are showed in the following two figures:

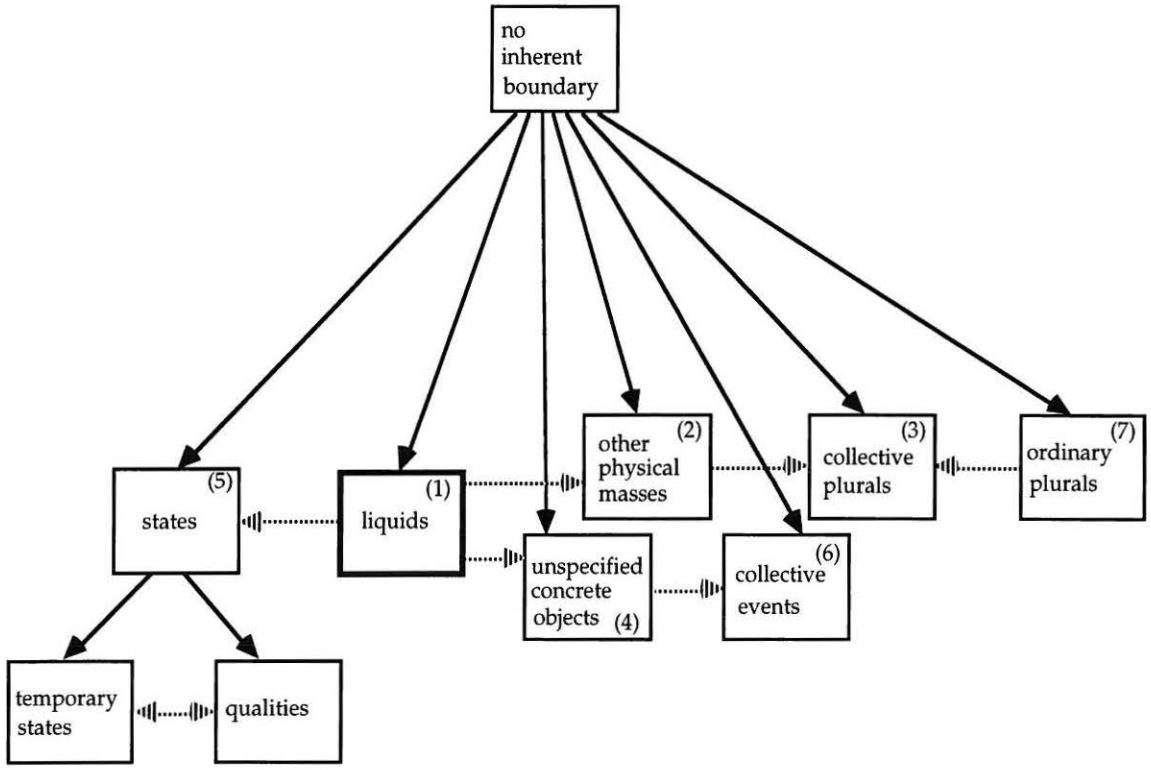

figure 17

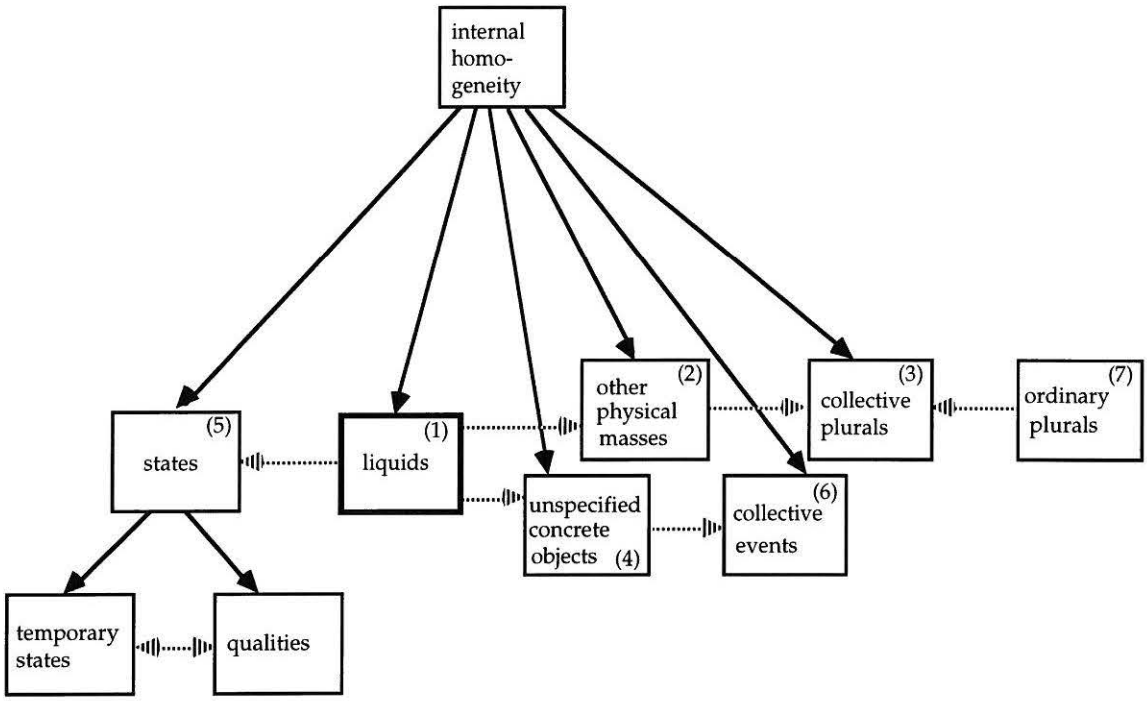

figure 18

(1) The prototype: liquids

Liquids are perhaps the most typical example of things languages tend to treat as uncountable concepts, or 'mass concepts'. According to Langacker (1987:203-7 and 1991:18-19), mass terms reflect construed *unboundedness* and *homogeneity*. Unboundedness refers in his terms to the non-existence of "a limit (internal to the scope of predication) to the set of interconnected entities that constitute a region" (Langacker 1991:585). Homogeneity refers to absence of internal variability (literally or construed), and is intimately linked to the notion of *indefinite expansibility and contractibility*; any subpart of a mass (however small or large) counts as an instance of the category.

Liquids are among the clearest examples of mass phenomena in the domain of three-dimensional space (which contains concrete, physical substances). They are inherently unbounded in a literal sense. That does of course not suggest that we never meet clearly delimited portions of liquid. But only containers can provide liquids with clearly observable spatial limits. Milk is considered milk, whether it takes the shape of a glass it is in, is spread out on the surface of a floor, is in the cow's udder etc.

The other central aspect of liquids is their internal homogeneity. We can split them up or merge them into any size, without having to use a new term; any portion of milk - from a particular drop of milk to the generic use of the term

(«milk is healthy») - is correctly referred to as «milk». The reason that liquids tend to be treated like this in languages is that they don't display any observable internal structure.

As we will see, the other groups of concepts in class 6 deviate from the liquids largely in terms of degree of *real* display of unboundedness or homogeneity. The prototypical status of the liquids is reasonably assumed exactly because of this special status; as entities that exhibit maximal literally perceived unboundedness and homogeneity. Thus, they instantiate the two class schemas 'no inherent boundary' and 'internal homogeneity' in a maximally concrete way.

The following are examples of liquids from the class 6 noun sample:[46]

madila	thick milk; sour milk
makubêlô	the last milk in a sack which only comes out after shaking
makgaritlha	the dregs of beer, traditionally reserved for older men
maphoko	froth on ground caused by rain water
maši	milk

(2) Other physical masses

This group of concepts refer to «powdery» or «grainy» substances. The nouns listed below are examples of such concepts.

mabududu	dry dust
makhafe	fringes
marêrêmêla	clots in a gravy; curds of sour milk, etc.
matsankô	wounds
matshêtshêthô	bran from sifted meal; husks etc., from sifted grain

They differ from 'liquids' mainly in that it is *possible* (to a greater or lesser extent) to conceive of the substances in question as more individuated than liquids. In

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[46] That liquids are considered the prototype of non count class 6, does not imply that *all* liquids are found in this class. The singular class 14 (which is the most typical «abstract class») also entails a number of liquids and other physical masses like *bojalwa* (alcoholic drink) and *bogôbê* (porridge). These nouns can pluralize, using the class 6 prefix. When they do, they naturally don't refer to «several instances» of a certain mass/liquid, but rather to different *types* or *kinds*: *Majalwa* and *magôbê* refer to different *types* of drinks or porridge, in the same way that «wines» in English refer to different *types* of wine.

other words: Our sensory apparatus allows us to perceive the internal constituents of these «objects» to a greater degree than in dealing with liquids. We can (although scarcely) see and talk about «a speck of dust» whereas we cannot observe any «speck of water».[47] On the other hand, it would make as little sense to talk about thirteen or one thousand «dusts» as it would to talk about thirteen or one thousand «waters». We simply don't interact with the substance called dust in such a way that the exact number of specks matters to us (except, of course, in rare cases when we wish to draw attention to *one* particular speck). The fact that humans tend to perceive dust as a mass is reflected in the fact that this little speck of dust neither in English nor in Setswana can be referred to as «one dust».

Thus, I see these concepts as extensions from the prototype, instantiating the same two class schemas ('internal homogeneity' and 'no inherent boundary') that the liquids do. On a scale of progressively greater individuation (as illustrated in Langacker (1987:205) with the example *water* > *dust* > *sand* > *grass* > *tile* > *cattle* > *timber*) these concepts come very close to the «less individuated» end of this scale.

(3) Collective plurals

From 'physical mass' I will suggest that there exist in Setswana a semantic extension to 'collective plurals'. With some nouns that have «normal» singular and plural variants in other classes (e.g. *nku* - sheep, sg. class 9, *dinku* - sheep, pl. class 10), one has the possibility to «use» the class 6 prefix for the purpose of profiling collectivity (*manku* - «collectivity/mass» of sheep, class 6). These concepts do not share the characteristics of the physical masses treated above in any literal sense. The extension is metaphorical. It can be argued that a collective plural reflects a *mass construal* (Langacker 1987:203-5). It reflects that the speaker has «imposed» a kind of homogeneity and unboundedness upon the objects in focus. As such, even the collective plurals instantiate the two class schemas 'internal homogeneity' and 'no inherent boundary'.

The listed nouns below show some examples of this «collective use» of terms. The typical candidates for «collectivising» are animals and plants,

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[47] A *drop* of water clearly does not have the same status as a *speck* of sand: Whereas a *speck* can be argued to be the smallest, inherently bounded entity that dust is composed of, the same can not be said about a *drop* of water.

although some other objects and phenomena also can be treated in this way (as we see in the case of *magosi*).

magosi	kings; kingdoms; chiefs; chieftains
makolane	a thicket of palm trees
manku	many sheep; flocks of sheep
maroana	a thicket of mimosa trees of a certain species[48]
mabi	a thicket of a certain species of thistle[49]

I would argue that it is neither the mere fact that these terms are "signifying *large numbers or aggregations* " (Cole 1955:82), nor that they refer to "animals of the same kind that are *confined to the same place* " (Ntsime and Krüger 1989:67), that leads to the use of a collective term. It is rather the speaker's mental construal (the individuals are «de-focused» and the group as an undifferentiated mass is highlighted) that determines the choice of a collective rather than an ordinary plural. A conceptualiser can, in other words, ignore the fact that it is easy to identify the internal constituents of the collective plurals, and that these constituents usually are not precisely identical. It is, however, not surprising that «great numbers» and «confinement to the same place» are the two situations that usually are given as explanations for the use of the collective plural in Setswana; a few widely dispersed sheep are, of course, not as easily conceived as a mass, as a big group of individuals that stay so close together that one hardly can make up their individual outlines from a distance.

(4) Unspecified concrete objects

The same «imposed» mass construal must be the reason for treating the examples below as non count nouns. Some of them sound familiar to an English or Norwegian speaker (*malao* - spices), whereas others do not represent entities that English or Norwegian treat as non count terms (in fact some are not treated as lexical items at all): *maadimô* - borrowed things, *mantsa* - loose hanging things.

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48 The dictionary lists "a species of mimosa trees" as the meaning. Setswana speakers that I have discussed this with, claim that this is the collective term for an otherwise class 3 noun.

49 This is probably also a case of dictionary error, when the dictionary gives the meaning: "a species of thistle". In this case, however, it is not unlikely that the collective plural would be the most frequently used term for the thistles, as they usually grow in thickets.

maadimô	borrowed things; borrowing or a loan; borrowings or loans
malao	spices
mantsa	loose hanging things
manotô	strays, as of locusts, cattle, etc.
masomosomo	many; crowds

What is going on here is basically the same as for the collective plurals, the difference being a matter of degree. The requisite abstraction is more extreme in these cases. A comparable (and well used) English example is a term like furniture. The actual entities referred to by such a very schematic term may be highly diverse. Nonetheless, it is possible to construe those entities in a homogeneous way, because of their similar fundamental character, not of configuration, but of *function*.

Because of construed homogeneity and unboundedness this group of concepts is reasonably seen as yet another metaphorical extension from the categories of physical mass, instantiating the class schemas 'internal homogeneity' and 'no inherent boundary'.

(5) States

So far I have delt with concrete objects (touchable objects existing in three-dimensional space), but class 6 also entails a substantial number of less concrete concepts. Langacker (1987:207) suggests that "abstract nouns - like their more concrete counterparts - designate regions that can be either bounded or unbounded", and that this is reflected in a distinction between count and non-count nouns. It is a fact that abstract nouns, just like the concrete ones, can be divided into count nouns (like the English: (a) complaint, (an) argument, (a) yell, etc.) and non count nouns (despair, hope, yelling, etc.)

The abstract non count nouns in my class 6 sample all refer to different *states*. Jackson (1990:10) divides the group of states further into *temporary states* and *qualities* .[50] He defines a 'quality' as a "more-or-less permanent characteristic of someone or something, while a 'state' is a less permanent type of situation". Although differing in degree of permanency, both temporary states and qualities are conceived not as single, momentary (or rather: «bounded») episodes, but as

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[50] His focus here is on verbs and situation types, but I find the definitions applicable to my data as well, although I only use part of it; he actually divides 'states' into four subgroups: quality, temporary state, private state, and stance. (Jackson 1990:10-5)

conditions that last for some time. The start and end points of these conditions are not in focus. In other words: temporary states and qualities don't exhibit inherent boundaries with respect to time. In that way they resemble the concrete masses; the difference only concerns *which domain* the lack of bounding refers to (three-dimensional space vs. time).

One can also reasonably suggest that humans construe temporary states and qualities as being homogeneous; we think of them as representing «single, coherent types of conditions» and remove the possibility of internal variation and complexity from focus.

Thus, the 'states' seem to represent a metaphorical extension from liquids (and the other physical masses), related to them by the class schemas 'no inherent boundary' and 'internal homogeneity'.

Temporary states

The following temporary states are from the class 6 noun sample:

makgwere	a state of confusion in the mind; problems; difficulties
mahupuhupu	state of being swollen and bruised from a beating; being bitten, as by bedbugs
mangetengete	state of being dented, or pierced all over
manyêrênyêrê	state of being very wet, very muddy
matlhatlharara	state of being untidy; being in a dishevelled and unkempt state

Qualities

The following qualities are from the class 6 noun sample:

maatla	strength; power
mafatswa	persuasiveness
makgakga	rudeness; impertinence
maona	immaturity
matletsetletse	great fullness; abundance, as provisions

(6) «Collective events»

The last group of non count concepts in the semantic network of class 6 I have called 'collective events'. These events, I will suggest, are construed in more or less the same way that the 'unspecified concrete objects' are. The «internal

diversity» is de-focused, and «imposed homogeneity» is highlighted: Each event, as *matshedisô* - condolences, (or any other from the example below) of course consists of several distinguishable smaller «action episodes», like the actual utterances, the way of behaving in such a situation, etc. But that is not what is focused upon. Rather, these notions refer to the whole «set of action episodes» as if they consisted of a «homogeneous substance». In referring to *matshedisô* one is not concerned about the internal structure of this event. What matters is that the whole «set» of behaviours altogether is taken to be an instance of condolences. In addition, I would suggest that the start and end points of these events are not focused.

Thus, 'collective events' represent metaphorical extensions into the more abstract «domain of actions» from the 'unspecified concrete objects' belonging to the spatial domain. They instantiate the class schemas 'internal homogeneity' and 'no inherent boundary'.

madumê	greetings
maiphitlha-	
phitlhwane	evening recreation; hide and seek
mapêkêpêkê	flashes of light; sparks
magawegawe	disputes; uproars
matshedisô	condolences

Although it is not evident in my proposed schematic network, there are clearly some similarities between this group of concepts and the 'states'. Both groups refer to «situation types». Hence, they produce a common abstract schema that one could label 'situation types'.

For graphical reasons I have not integrated that into the network, as it is not of major importance for the general understanding of the semantics of class 6.

(7) Count noun class 6 plurals (ordinary plurals)

Apart from including non count nouns, class 6 is one of the plural classes in Setswana: Noun stems with class 5 and class 14 prefixes (both these classes are singular classes) occur with the class 6 prefix when they are used as plural nouns. Historically class 6 is a Proto-Bantu merge of two different classes, one referring to plurals and the other to masses (see for example Greenberg 1963:31). The class of

masses seems to be the origin of the non count part of today's class 6, while the rest consists of regular plural forms.

Although of different origin, a possible semantic link between the two groups of nouns can be established on the background of our construal of plural phenomena in general. Langacker (1991:76) argues that ordinary plurals belong to the mass noun category: "the profile of the plural predication is a region that is unbounded within its scope in the domain of instantiation". What distinguishes a plural from a non count mass noun for Langacker (1991:77-8) is that a plural "profiles a mass that we can think of as being formed by replicating indefinitely many times a discrete entity that we are accustomed to dealing with individually [...]" This «replicability» is either not present at all (as in *madi* - blood) or de-emphasised in different degrees dependent on the perceivable «particulate nature» of the entity in question (ranging from examples like *matshêtshêthô* - bran from sifted meal, to the 'collective plurals'). Accordingly, he refers to plurals as *'replicate mass'*, while a non count mass noun is referred to as *'non-replicate mass'*.

The 'replicate' and the 'non-replicate' masses thus share the class schema 'no inherent boundary', while they differ in (conceived) internal structure.

The network that I have suggested for class 6 is based primarily on the non count nouns. If I were to present the *complete* class 6 network, the suggested network would become only a relatively small *part* of the larger network including all the different other schemas representing the plural versions of the class 5 schemas (of which we have seen that a majority instantiate a 'non-individuability' schema) and the class 14 schemas (which typically would include abstracts and liquids and viscous substances). Integrating the schema 'ordinary plurals' as *one* among the other parts of the network as I have done in this section, then, is an extreme simplification, perhaps even an indefensible one. Yet I have chosen to do so in order to show that there might be an associative link between these plurals and that part of a «full network» that represents the non count nouns.

The schema in the class 6 network that is most directly linked to the ordinary plurals, are the 'collective plurals'. It would clearly be unreasonable to claim that the large group of ordinary plurals are extensions from the collective plurals. An extension relationship will have to go in the opposite direction, starting off somewhere in the larger «full network» of class 6. That is what I have tried to indicate when I, in the figure representing class 6, have represented the

relationship between the ordinary plurals and the rest of the non count class 6 network.

The *mass* term in linguistics

In linguistic literature the terms 'non count noun' and 'mass noun' tend to be equated. The definition of 'mass' given in Crystal (1991:212) illustrates the point: "A term used in the grammatical classification of nouns; opposed to count." It is easy to establish the non count nouns in a given language; they simply don't occur marked for 'number'. Intuitively it seems rather likely that the grammatical term 'mass' in addition points towards certain semantic qualities. Accordingly, Crystal continues: "The term refers to those nouns which the speaker treats as continuous entities, having no natural bounds (contrasting with the separable 'countable' quality of count nouns)." However, faced with the fact that different languages don't treat all possible candidates for a «mass description» in a similar manner, he states: "but the distinction is not made on semantic grounds alone; the contrasting pattern of co-occurrence with determiners, quantifiers, etc., is the main evidence, e.g. **an anger* vs. *some anger* shows this to be a mass noun. There is no logical reason why nouns should be count or mass: a concept may be countable in one language, but mass in another, as in the case of *information*, which is mass in English, but countable in French (*des informations*). "

Many linguists have used the apparent non-systematicity between the ascribing of count vs. non count nouns to apparently similar concepts, as a «proof» of the arbitrariness of grammar. I would rather interpret this as an effect of the grammar's sensitivity to human conceptualisation. Wierzbicka (1985:316) gives some striking examples as to what extent we are able to change our viewpoint concerning which entities that possibly could be perceived as mass (or non count) entities. She refers to examples from literature, among them the mother termite who is concerned about her child and utters the following: "Johnny is very choosy about his food. He will eat book, but he won't touch shelf." Here «book» and «shelf» are treated as mass concepts. Such shifts in conceptualisation are indeed possible: the sentence has *not* become incomprehensible or «ungrammatical»; it rather helps us to see «book» and «shelf» as «foodstuff», on a par with «porridge». Hence, it does not seem unlikely that different languages place the boundary between countable and uncountable differently, and that one single language can draw a «countability boundary» between seemingly similar concepts like «oats» and «wheat». Or in Wierzbicka's own words: "Obviously, there are different possible ways of conceptualising the

world, there are different possible cognitive perspectives, and a termite's perspective may differ from that of an Englishman. But the different conceptualisations have their own logic, which grammar reflects and illuminates."

On the other hand: some objects and phenomena are more readily accepted as mass terms than others. To be able to accept «book» or «shelf» as mass terms, we have to take the termite's viewpoint. For human beings it is a lot more natural to treat a book as a self-contained clearly bounded entity that cannot be «portioned out» in small parts that still count as «book». In other words: «book» is a clear candidate for the label 'countable'. The most likely candidates for mass descriptions will be objects with no clear-cut boundaries, and which can be divided arbitrarily and still be named with the same term. Such concepts will tend to be treated as mass terms in most languages. But there are also a substantial number of concepts that can be conceived of as easily in a «countable manner» as in a «mass-like manner» (as for example Crystal's (1991:212) example *information* vs. *des informations*). Such phenomena will tend to be treated differently in different languages.

What is not completely predictable is not by necessity arbitrary: Although we see that not exactly the same concepts are treated as mass concepts in Setswana and English, that does not imply a lack of *semantic motivation.*(cf. Lakoff 1987). On the contrary, we have seen that variability of human construal can lead to different «solutions» in cases where it is not all that obvious whether it is reasonable to treat something as a mass or not (*madumê* vs. a greeting/greetings). The greatest bulk of nouns in the two languages will, however, be confined to the same «countability category» for obvious reasons: Only a weird language would conventionalise number marking on terms referring to liquids and not to those referring to clearly delimited concrete objects.

Concluding remarks to the proposed class 6 network

Explicit referral to a notion of 'mass *construal*' in my analysis, is perhaps the most important contribution to the understanding of the non count part of class 6. Without the understanding that a language user has the ability to construe a situation, object or phenomenon in alternate ways, it is difficult to see the semantic connection between as apparently different objects as *maši* (milk) and *mabodi* (the collective plural of *podi* - goat).

The non count class 6 nouns in Setswana shows us which concepts the speakers of this language have treated as «mass-like». We see that some of these concepts are treated in the same manner in English, while others are not.

Liquids, collective plurals, and to a certain extent abstracts, have been put forward as relevant groups in the other works with which I have compared my analysis. With the exception of Spitulnik (1987) no explicit attempts have been made neither to connect these three groups of concepts semantically, nor to connect other perhaps less obvious groups to these most typical ones.

Lastly, there seems to be a tendency that reduplication of noun roots is used a lot more frequently in «non count class 6» than in any other class. If that is the case, it might represent an interesting indication on a connection between the noun form and the semantic content; it surely would make sense if for example states that reflect the result of repeated actions (like *mangetengete* - state of being dented, or pierced all over) rather regularly were represented by reduplicated roots. Unfortunately though, I have not been able to dig into this possibly interesting area.

4.5. Class 7

In the following I will suggest that the class 7 semantics is based upon the prototypical schema 'instrument', in the sense of «intermediary in actions». We shall see that the notion of action *becomes important; almost all extensions from the prototype instantiate the class schema 'participation in action'. The network represents a «metonymic chaining» where almost each schema mirror one of the participants in a prototypical «action chain».*

Earlier treatments of Bantu class 7 semantics

Cole (1955:84-6) again uses the label "miscellaneous" when he characterises the semantics of this class. According to him, the class "includes names of parts of the body, tools and instruments, animals, languages and characteristics, and a number of personal nouns". He divides the personal nouns in two categories: those that refer to "people having a mental or physical defect, or some habit, custom or other peculiarity of manner or appearance which characterises them as being abnormal" and those that refer to "people who are experts or have some special ability or desirable characteristic". Cole also points to the fact that a lot of nouns in this class are derived from verb stems.

Torrend (1891:112) sketches four groups of notions belonging to class 7: 1) the names of languages, 2) the word for "a thing, and some substantives in which this word is understood", 3) "the words for any sort of limited break, or cut, on land or water, or on a body", 4) "short" things, or rather, as he explains it further: things that are "relatively thick in one part and small in another, or halved, or protruding with a thick basis and to a comparatively small height etc.".

Meinhof (1906:12-3) states that in class 7 "Sitte, Gebrauch, Werkzeug" (custom, use, tool) are meanings that are easily recognised. Comparing with Torrend's notions, "Sitte" (custom) includes languages, as the Bantu languages do not distinguish between language and the manners, ways or customs of the people under consideration. Meinhof continues by claiming that "aus dem Begriff «Sitte, Art und Weise» entwickelt sich die Verwendung des Präfixes zur Bezeichnung von *Abstrakten*".[51] He then maintains that the class 7 prefix expresses the notion "Ding, Sache" (thing), but does not, as Torrend does, refer to the fact that even the generic term 'thing' belongs to this class. The use of the

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[51] In English translation: "from the notions «custom and manner», the use of the prefixes to signify *abstracts* has developed".

"Sachenpräfix" («thing-prefix») to refer to human beings implies, according to Meinhof, that such persons are being treated "verächtlich" (contemptuously).

In Denny and Creider's (1986:223) classificatory system, class 7 belongs to the noun classes that can be classified on the basis of "kinds". They suggest that the primary meaning in class 7 is "instrumental artifact", something that would include Meinhof's "Werkzeug" and perhaps also represent one specification of Meinhof's notion "Gebrauch". Denny and Creider also argue that it is "a fairly natural extension from 'used object' to 'despised object' ", and that it appears that this additional meaning had been established in Proto Bantu for class 7. If this is applied to human beings, it resembles Meinhof's argument that the «thing-prefix» adds a mark of contempt to the persons that the term is applied to, although Meinhof focuses on *thing*, whereas Denny and Creider focus on *use*.

Batibo (1987:17) argues that the original notions in class 7 "denoted objects with marked or special characteristics. Such characteristics could be deformity, artificiality, eventfulness or speciality." Deformity, or "lack of something" as he explicates it, may be seen as connected to the notions of contempt that both Meinhof and Denny and Creider touch upon. And artificiality (Batibo himself adds: "man-made") is reasonably interpreted more or less along the same lines as Denny and Creider's notion "instrumental artifact". Meinhof's "Werkzeug" could probably also be included in the concept 'artificiality'.

Spitulnik (1987:64-7) starts her treatment of class 7 by claiming that this class often is "considered a kind of residual class in Bantu since it contains the widest variety of 'inanimate' nouns, including the generic term for 'thing' ". She goes on to demonstrate that many ChiBemba class 7 nouns are generic nouns or refer to artifacts and parts of things. As we have seen, both 'thing' and artifacts have been extracted from class 7 by other authors also. According to Spitulnik the class 7 prefix in ChiBemba in addition functions to derive augmentatives of nouns from other classes. It is also productive in deriving nouns from verbs, and Spitulnik claims that when they do, the derivation seems to imply a notion of "discrete, bounded thing". She also, as many others, recognises that numerous nouns referring to names of various Bantu languages are found in this class. The human beings in class 7, she refers to as "those who are unsocialized or completely outside the social world". Contempt is often a result of such situations, cf. Meinhof and Denny and Creider.

Contini-Morava (1994:13) refers to Denny and Creider's statement that the "primary meaning [of Proto-Bantu Class 7] is instrumental artifact". She agrees on the assumption that 'primary meaning' is interpreted as 'prototypical meaning'.

Further, she is adding to the notion of instrumental artifact (or "utilitarian objects" as she calls it) the specification: "small enough to hold in the hand", because, as she puts it: "this applies to the majority of terms for instrumental artifacts in Class 7, and it provides a motivation for the major semantic extension within the class, to 'small entities in general', not all of which are instrumental artifacts". In her proposal for a semantic network, Contini-Morava includes the following: small artifacts, small animals, immature beings, people with physical defect/lack, pieces/parts of things, shortened things, pointed things/parts, part of substance, similarity/manner, small body parts, ailments associated with body parts and concrete object associated with verb (product, implement, etc.).

As we can see above, there are, despite of different viewpoints, some rather conspicuous similarities between the quoted authors: Instruments/artifacts, the generic term 'thing', languages/customs as well as negatively marked human beings all seem to be among the notions that most of these different authors extract from their data.

Proposal for a schematic network of class 7

My own suggestion for a semantic network is built around 'instruments' as the prototype. That is hardly surprising, considering the other contributors' considerable attention to the same phenomenon. However, my focus will not be on the «man-made» aspect of these objects, cf. «instrumental *artifact*». Rather, I have come to the conclusion that the central point concerning these objects is their instrumental *functions*; that they participate in specific *manners* related to different *actions*. This is then the background for different semantic extensions from the prototype to other groups of concepts within the network.

The whole network of extension relationships in class 7 seems to represent a parallel to a «chain of actions», or what Langacker (1991:285-6) refers to as "the canonical event model" which "represents *the normal observation of a prototypical action*". Of course, «action chains» or «event models» are usually thought of as belonging to grammatical structure involving verbs, and the semantic role of a noun is suggested from a broader context. Nevertheless, a comparison with typical elements (or participants) in an action chain has been clarifying for the understanding of the semantics of class 7 nouns: We shall see in the following that the extension relationships in class 7 in a way mirror the relations between typical participants in action chains; the different noun schemas together constitute a metonymic chaining based on the different

relations between typical «participants» in actions: instrument, agent, manner, place, and affected.

The network of extension relationships that I have suggested for class 7, can be represented as follows:

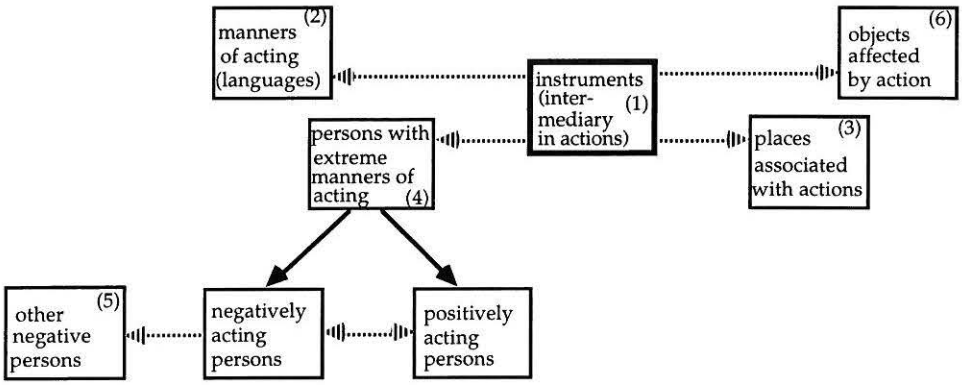

figure 19

The network including the class schema can be represented as follows:

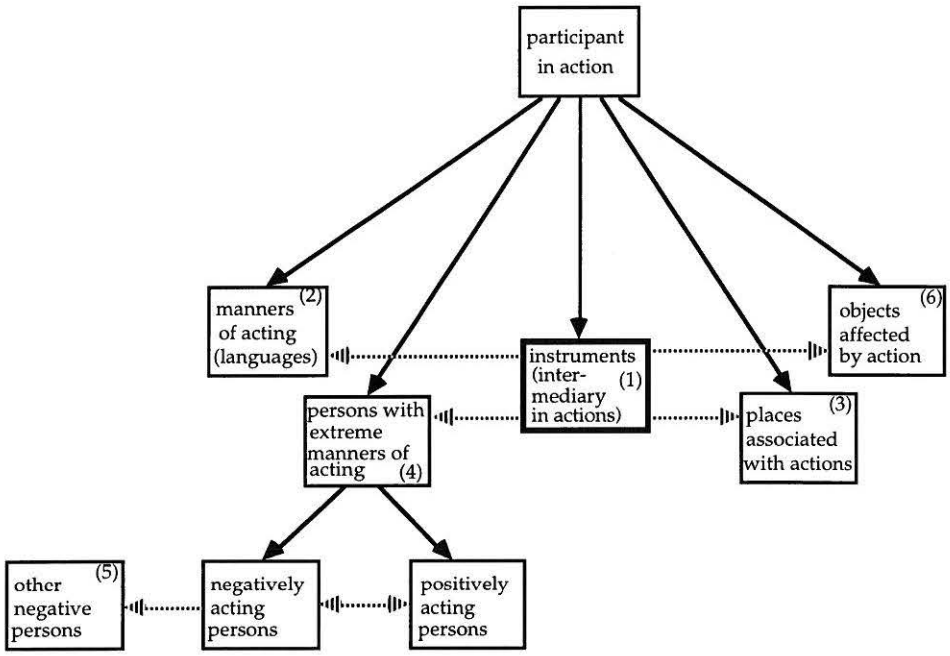

figure 20

(1) The prototype: instruments

Langacker (1991:285) refers to the 'role archetype' *instrument* as "a physical object manipulated by an agent to affect a patient; it serves as an intermediary in the transmission of energy".[52] The «setting» for an instrument is in other words an active (typically human) performer of an action, *using* the instrument with the purpose of affecting a passive (typically inanimate) object.

In dealing with noun semantics we are, of course, no longer speaking about semantic roles in the usual sense. Rather, we are focusing on *what kind of concepts* certain nouns refer to. In this case we are faced with a group of concepts prototypically referring to physical objects manipulated by an agent to affect a patient. Or in other words: instruments function as «intermediary in actions». We see that this prototype definition equates with Langacker's definition of the 'role archetype' *instrument* above.

In the following, we will see that these nouns that instantiate the 'instrument' schema, together with other schemas in the network instantiate an abstract schema that we may call 'participant in action'.

As the great majority of nouns referring to concrete, non-animate objects in class 7 refer to different types of instruments, and as we will see that these instruments serve as the source for several other semantic extensions in the schematic network of class 7, I have chosen to represent the instruments as the class prototype.

As the examples below shows, many of the nouns referring to instruments are derived from verbs; verbs referring to the action in which the instrument is used as *a means*. I suggest that this fact represents an additional indication that these nouns probably are construed as intimately linked to the action that the verbal origin refers to.

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52 Discussing semantic roles, Langacker (1991:285) argues that they represent pre-linguistic conceptions and refers to them as *role archetypes* in order to "call attention to their primal status and non-linguistic origin".

Included in the definition of *instrument* are two other roles: The role archetype *agent:* "a person who volitionally initiates physical activity resulting, thorough physical contact, in the transfer of energy to an external object". And the role archetype *patient*: "an inanimate object that absorbs the energy transmitted via externally initiated physical contact and thereby undergoes an internal change of state". Included in the notion of archetypes is of course a conception of *prototype,* and Langacker's definitions of semantic roles clearly show that they are based on prototypical characteristics.

segêlêlô	a vessel for drawing water [*go gêlêla* - to draw water/fluid]
segopa	a dustpan; a scraper [*go gopa* - to remove by scraping; sweep up]
sekampane	a bow
sekgampane	a kind of musical instrument
sepalangwa	vehicle [*go palama* - to ride, *palangwa* - is being ridden]

(2) Manners of acting, characteristics (including languages)

This schema represents a generalisation over nouns that indicate the manner or way in which some action is being undertaken. The nouns in question can also be used as manner adverbs.[53]

Many of these nouns belong to the small group of noun roots that exhibit «multiple class membership»: In Bantu languages some roots can take two or more prefixes, and a change of prefix results in a change of meaning. In the examples below, I have, to illustrate the point, given an alternative form (the same root attatched to a different prefix) with a different meaning for each item.

Among various types of characteristics, I suggest that names for languages should be included in this group. The reason is that these terms not only refer to languages in the strictest sense, but also to the characteristics of the people who speak the language; their manners, customs and culture. In my noun sample only two names of languages are represented. (Actually only one of them refer to a language by the usual term, the other having status as a kind of nickname.) However, names for languages are assigned to this class on a productive basis, not only in Setswana, but in most Bantu languages.[54]

I suggest that the «manner concepts» represent metonymic extensions from the prototype 'instruments'. The «manner concepts» instantiate the class schema 'participant in action'.

sebele	personality; reality; a person himself; bodily form [*mmele* - body]

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[53] In the standard grammar of Setswana, Cole (1955:364) calls attention to the adverbial use of class 7 nouns "indicating manner, fashion or characteristics".

[54] Thus the term for Norwegian is made by adding the class 7 prefix to the (English) name for the country of the speakers, giving *Senorway* as the result. *Senorway* then refers to the language of the Norwegians, *as well as* the manners and characteristics of the Norwegians.

segomo	behaving like cattle [*kgomo* - a cow, bull]
segosi	royal; pertaining to royalty [*kgosi* - a chief, king]
sejatlhapi	English [*go ja* : to eat, *tlhapi* : fish][55] [*Mojatlhapi* - an Englishman]
Sekololo	language of the Bakololo; in the custom, or tradition of the Bakololo [*Mokololo* - a «kololo-person»]

(3) Places associated with actions

The examples below refer to places that typically are associated with certain actions. Thus, they share a «connection to *action*» with the prototypical group: instruments. In that way they can be seen as metonymic extensions from the prototype.

The group represents an instantiation of the class schema 'participant in action', although its «participation» is clearly less central than what is the case for the prototypical group; the *place* for an action constitutes a «background» rather than a true participant in an action event.

sebothêlô	a resting place for cattle [*go botha* - to repose; rest]
sebatla	an open valley, or a treeless place, or plain; an open space in the veld, or a level place, hence a spot that is suitable for holding unregulated meetings; a kind of Hyde Park Corner
seferô	a path between hedges[56]
setsha	a plot; a plot of ground for building, or other purposes; estate

(4) Persons (agents) with extreme manners of acting

The personal terms that this schema is a generalisation over, refer to human beings who are characterised by «extreme manners of acting»: Either they are «experts» who use their skills in an exceptionally good manner, or their manners are exceptionally fierce or at least intensively negative, cf. the examples below. Often, these nouns are derived from verbs referring to the type of action these persons are engaged in.

It is an interesting fact that several of the human terms in class 7 have their less intensified versions in class 1: A *sejadi* is an «expert planter», whereas a

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55 literally, «the fish eaters' language».

56 where people walk.

mojadi is just any ordinary planter, and a *mogwanti* (bully) is not as bad as a *segwanti* .

This schema represents a metonymic extension from the prototype schema 'instrument', as it focuses on another «participant» in the action chain; namely the *agent* who is performing some act(s) in an exceptional way either by means of a concrete (spatial) instrument or by means of metaphorically understood «instruments» like a certain personal skill or ability. Thus, this schema instantiate the class schema 'participant in action'.

I have chosen to represent the «positively acting persons» and the «negatively acting persons» as two different instantiations of 'persons with extreme manners of acting'. In the network figure I have represented the relationship between these two groups with a double extention arrow, indicating that I have no reason to present one group as more central than the other:

Positively acting persons:

sebui	orator; speaker [*go bua* - to talk; speak]
seêmana	a mighty one, hence *monna wa seêmana* , a man of war. Also: mightiness
segwaba	a person who can accomplish or contrive to do difficult things
sejadi	planter [*go jala* -to sow]
seopedi	a renown, or famous singer; an expert singer. Also: musical instrument [*go ôpêla* - to sing]

Negatively acting persons:

seaka	a harlot; a prostitute
segwanti	a bully [*go gwanta* - to be wilful; conduct oneself in a defiant, or impudent manner; ...]
seitaodi	an unruly individual; a lawless individual; one who is not law-abiding [*go itaola* - to be lawless; be delinquent; govern oneself]
serukutlhi	a rebel; a troublemaker [*go rukutlha* - to rebel; brawl; riot]
seswapelo	a sloven; a dead hearted one; desperado [*go swa* - to die, *pelo* - heart]

(5) Other negatively marked persons

It can be argued that the schema 'negatively acting persons' is responsible for a further metonymic extension to persons with negative characteristics in general, but who lack the strong focus on *action*, as the following nouns exemplify:

selêma	a fool
semumu	a dumb person
serothola	a foolish, careless person; one not able to do anything properly
setêtê	a spoilt child
setlatla	a fool; a silly person

The connection between this group of cocepts and the rest of the network can be represented with a local schema 'negativity', that this group shares with the 'negatively acting persons':

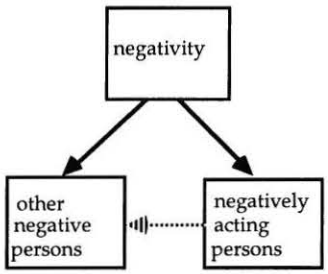

figure 21

(6) Objects affected by action

This schema reflects a generalisation over concepts that refer to objects which are involved in actions or events, but in a clearly passive way. Jackson (1990:24) defines the semantic role 'affected' as "an object that is directly involved in a state or event but does not play an active part in it".

The following examples show that these nouns refer either to objects that typically have been affected by extensive use (with the result that they have become worn down), or to objects that typically are affected by the action/event that is referred to with the verb that they are derived from.

sefolotsana	an aborted foetus of an animal; a weakling [*go folotsa* - to abort]
segogou	an old and worthless skin; (an old skinny person)

sejô	food; a type of food [*go ja* - to eat]
seketana	a rag
sekgwene	a stump

This schema thus represent yet another example of a metonymic extension from the prototype 'instruments' based on shared participation in a «chain of actions/events». It shares with the prototype the class schema 'participant in action'.

Concluding remarks concerning the suggested class 7 network

My suggestion for a class 7 network represents a rather radical break with former treatments of the class 7 semantics.

That 'instruments' in my proposed network employ the position of class prototype, is hardly controversial though. It is clearly compatible with most other works on Bantu class 7 (cf. the quoted authors in the beginning of this chapter). However, whereas most of these other works focus on «thing», «use» and «man-made» in dealing with the instruments, I have directed the focus towards *participant in action*.

An instrument can easily be seen from different angles, or rather: our "focal adjustment" may differ (cf. Langacker 1987:489).[57] Hence, a cup - *senwêlô* - may be seen as a «thing», a «dead object», a «man-made object», a «utilitarian object», etc. It can also, as I will suggest is the most relevant viewpoint concerning its class 7 membership, be seen as an object that an agent uses *in the act of* drinking (*go nwa* - to drink, the applied form: *nwêla*). Supporting my suggestion is the fact that a majority of instrument terms are derived from verbs.[58]

Focusing on the fact that instruments take part in *actions* provides us with the motivations for the semantic extensions to other schemas in the class 7 network. With the exception of one schema, I have suggested that all schemas in the network of class 7 instantiate the abstract class schema 'participant in action'. I have not come across any treatment that gives the *action* aspect such a central

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57 "variation in how a situation is conceived, particularly variation pertaining to selection, perspective and abstraction" (Langacker 1987:489).

58 An investigation of degree of saliency of the verbal origin of these nouns (for mother tongue speakers) would be valuable, as a high degree of saliency could represent a further support to my analyses. Unfortunately though, it has not been possible to include that within the limits of this thesis.

place within the semantics of class 7. Rather, it has been common to focus on the «dead», «thing-like» nature of the majority of class 7 concepts. While appreciating this tendency, my interpretation of the Setswana data don't support the *centrality* of such notions. It is possible that a «full» semantic network, explicitly labelling all relevant generalisations found in the class, would have to integrate a schema 'inanimate' (or 'dead object'/'thing'), but that does not seem to be the generalisation that is best suited for capturing the semantics of class 7 in general.

Both Spitulnik (1987:64) and Contini-Morava (1994:13) appreciate the fact that class 7 exhibits a highly productive process of deriving nouns from verbs. Since they don't put any weight on the notion of *action* as a possibly important aspect of class 7, however, they don't interpret this productive process as an indication that verbal origin might be central to the understanding of the class 7 semantics in the sense that it points towards the centrality of *actions*. Rather, Spitulnik (1987:65) continues the «tradition» of interpreting class 7 as the «thing class», when she suggests "At the most general level, the type of semantic change accompanying Cl. 7 (ici-) prefixation to a verbal infinitive or verb stem can be glossed as 'thing' or 'thing of' ". She even suggests a re-interpretation of what has often been referred to as the «manner of» derivational function of the class 7 prefix, claiming that "[...] it seems here that our characterization of 'thing (of)' is just as adequate. Thus, *icíBembá* denotes that which is most significantly of the Bemba, e.g. their way of life, language, etc." I would argue that Spitulnik's characterisation is *not* as adequate; according to my view there is no indication either in Bantu languages or culture that suggest this «thing-interpretation» of languages or other kinds of manner concepts.

After appreciating the prototypical status of 'utilitarian objects small enough to hold in hand', Contini-Morava (1994:13) makes a point of «*smallness*», suggesting that "'small enough to hold in the hand' [...] provides a motivation for the major semantic extension within this class, to 'small entities in general' [...]". Again, it is possible that 'small' is a generalisation over a large number of class 7 concepts, and that it could be included in a «full» network of the class. But I have not seen any indication of its *centrality* in my data. It is possible, even, that it is not the size itself that is relevant, but rather the «manipulability» of objects that are used in *actions*. In that case, relatively small size would *follow* rather than be an independent semantic factor.

Concerning the large amount of nouns derived from verbs, Contini-Morava (1994:13) introduces the schema 'concrete objects associated with verbs

(product, implement, etc.)'. In my view that does not seem to be a very natural generalisation over a group of concepts; the direct referral to verbs makes it sound more like an example of «expert categorisation».

It is also my impression that she structures her suggestion for a network in an unfortunate way. Contini-Morava (1994:11) explains that the topmost category in a chart, what Langacker calls a 'superschema', is "a maximally abstract category that holds together the various subcategories". The 'superschema' is in other words identical to what I have called 'class schemas' in my networks. In her class 7 chart (reproduced in my chapter 2) the topmost category is 'utilitarian objects small enough to hold in hand', but that category is referred to as the prototype in the text (Contini-Morava, 1994:13)! And as no other group is represented as an instantiation (indicated in her charts with solid lines) of the topmost category, it clearly cannot have the status of a 'superschema'.[59]

In sum, we have seen that class 7 has provided us with the greatest extent of variability between different analyses. In my view, focusing on the «thing» aspect might have been a blind alley, but there remain even more thorough investigations before one can draw very clear conclusions about the matter. Nevertheless, I have suggested that the aspect 'participant in action' is more relevant to the class 7 semantics than the «thing» aspect, and further work could be done to evaluate such a stand. Experiments aiming at testing the saliency of the verb base of many class 7 concepts could be one method of further investigation.

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[59] An additional weakness is that by using lines instead of arrows in the charts, she does not clearly indicate the direction of the semantic relationships, unless the lines are to be read systematically from top to bottom.

4.6. Concluding remarks

The semantic networks that I have suggested in this chapter, have turned out to be in accordance with «typologically natural systems» (as explicated in Corbett 1991):

- Many languages exhibit gender distinctions based on configuration. That is reflected in the configurational contrast between class 3 (long) and 5 (roundish).

- Degree of animacy is also reflected in many languages in various ways. In my suggested networks we see that animacy or the degree to which something can be perceived as consisting of «live» material is an additional relevant factor in characterising class 3 and 5. Of course it is relevant to the meaning of the «human» class 1 as well. Class 1 exhibits the highest degree of animacy; human. A large portion of class 3 nouns refers to entities which, although neither human nor animal, represent «live» material to a certain extent (plants, objects made of plant material or skin) or can be associated with particularly *lively* events. The majority of class 5 and class 7 nouns consists of clearly less «live» entities.[60]

- The internal structure of class 7 is based upon concepts that we usually find reflected in other parts of language (connected to syntax), namely concepts referring to different participants (or semantic roles) in an «action-chain». Although usually not thought of as a part of *nominal* semantics, it is possible to find other languages which also seem to «utilize» this «action-chain» perspective in dealing with nouns.

In Fula the (primarily verbal) infix *-ir-* connects the three concept-groups *instrument, manner,* and *place.* Arnott (1970:348-353) introduces the term "modal" and describes how "[it] is used with reference both to the manner in which something is done, and to the means or instruments employed. In fact the modal and instrumental meanings merge into one another [...]." Further, he describes how the locative "is identical in shape with the modal extension", and then how both the modal and locative extension *occur in nouns as well;* the modal when the noun is "referring to an *instrument*", the locative when the noun is "referring to a *place* associated with an action".

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[60] As mentioned earlier, class 9 is sometimes referred to as the «animal class». As such, class 9 would also belong in an «animacy hierarchy».

In Hausa "various types of nouns may be formed from verbs by employing a *ma-* prefix with or without an -[*ii*] suffix". The types are as follows: 1) "Nouns signifying the *agent or doer of an action*", 2) "[n]ouns signifying a *place* where the activity indicated by the original verb is performed", and 3) "[n]ouns signifying a *tool* or *implement* involved in the action indicated by the original verb". (Kraft and Kirk-Greene 1979:194-96)

In sum, Fula treats together (with the same infix) 'instrument', 'manner', and 'place'. Hausa connects 'instrument', 'place', and 'agent'. Setswana seems to integrate all these concepts (and add one more) into the noun class 7: 'instrument', 'manner', 'place', 'agent', and 'patient' (represented by the schema 'objects affected by action').

- Even the 'non-individuated' schema in class 5 seems related to phenomena known from other languages: Some languages mark morphologically *single* entities of something that normally is treated with a collective term (thus indicating a 'mass construal'): In Russian the 'singulative suffix' *-in* is used in this manner. *Izjum* (raisins) and *soloma* (straw) are collective terms. It is, however, possible to draw attention to a single raisin and a single straw by adding the singulative suffix: *izjumina* and *solomina*.[61] Arabic exhibits the same phenomenon: formally *tuffa:ḥ* (apples) and *ṣadaf* (shells) are singular nouns, but they are used with a collective meaning. In order to speak about one single (or a definite number of) apple(s) or shell(s) one has to add the feminine suffix *-a(t)* , resulting in *tuffa:ḥa(t)* and *ṣadafa(t).*[62]

In these cases the «marked» (and probably least frequent) terms are those that refer to single entities. In Setswana, the schema 'non-individuated' seems to suggest that the «unmarked» case is referring to the plural versions of these entities. A frequency study of the use of singular terms (class 5) as opposed to their plural versions (class 6), would be useful. On a hypothesis that the plural forms of the nouns that are connected to the 'non-individuability' schema are «semantically unmarked», one would expect the plurals to be significantly more frequent than their singular counterparts.

- Finally: the distinction between countable and uncountable notions is of course a very common one.

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[61] Tore Nesset p.c.

[62] Elie Dib Wardini p.c. (The (t) in the suffix is pronounced only in certain surroundings.)

The analyses that I have presented in this chapter do not account for *all* the data from my noun sample. They do, however, give an account of the great majority of the data. Leaving out the few animals and purely abstract notions (with the exception of abstracts in class 5), my analyses provide explanations of between 85% and 69% of the data belonging to the four classes. (The figures are as follows: class 3: 85%, class 5: 76%, class 6: 83%, and class 7: 69%.)

It seems reasonable that the figures are not higher. First of all, my data only represent *a relatively small part* of the nouns in the classes under consideration. It is therefore not impossible that some generalisations (representing local schemas, or even more important schemas) have escaped me. It is also not unlikely that one will never be able to account for absolutely every concept; it is probably practically impossible to reveal every association that is relevant in such large networks of similarities.

Further studies might, however, throw some more light on the semantics of these noun classes. In addition to analysing a larger data sample, there are other fields of inquiry that probably also would be useful for an increased understanding:

1) Thorough analyses of that portion of the nouns that exhibits «multiple class membership» (nouns that can change class prefix, and thereby change meaning) would be useful. I am aware of the fact that a few such studies have been carried out, but these studies seem to take it for granted that it is *only* the «multiple class nouns» that can be studied from a semantic point of view (as in Rakgokong 1986). Therefore these studies have not searched for possible semantic connections between this limited portion of nouns and the numerous other nouns.

2) Systematic analyses of borrowings from the same point of view (comparing borrowings with proposed semantic networks for the different classes) would also be important.

Borrowings are normally treated in the following ways:
- The new noun may by and large retain its shape, only modified according to Setswana phonotactics, and become a member of the prefixless class 9 (phone > *founo*). Class 9 includes the majority of borrowings in Setswana.[63]
- If the foreign noun's first syllable (after phonotactic modification) resembles one of the existing noun class prefixes, the noun may be assigned to the class of that

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[63] Cf. for example the extensive list of borrowings in Janson and Tsonope (1991:137-151).

particular prefix (starch > *setatšhe* (class 7 with the prefix *se-*)). This is, however, not necessarily the case. *Sementšhise* (sandwich) is a class 9 noun; the plural of this term is *disementšhise* (class 10).

- In some cases where phonology would suggest one class, the noun is assigned to another class according to semantic principles. One example is that 'tree' terms on a regular basis are assigned to class 3 (by attachment of the class 3 prefix) independent of the phonological form of the original term. There are other examples as well, although they might not be numerous: the class 7 noun *sekopisi* (meaning photocopier) from English *copy/copies* suggests that the language users in this case have assigned the noun to a class according to semantic and not phonological principles (as a photocopier is clearly an instrument).

It would be useful to investigate whether, and to what degree, a concurrence of semantic and phonological motivation (cf. *sekurufu* - from English *screw*) would lead to increased probability for assigning a noun to a certain class, as compared to cases where only phonology seems to be responsible for the assignment.

3) A study of the relationship between original verbal meaning and the noun meaning in the cases of nouns derived from verbs could also possibly yield useful information.

4) Integrating extensive cultural knowledge into the semantic analyses would clearly also represent another fruitful point of view (and is absolutely necessary for a complete analysis).

5) Finally, a broad and systematic comparison with data from other language families could also be used as an additional means of evaluation concerning hypotheses about the semantics of Bantu noun classes.

Chapter 5. Psycholinguistic testing of the hypotheses

5.1. Introductory remarks

As a supplement to the analyses based on the material from the noun database, I have conducted a psycholinguistic experiment in the form of a nonsense word test presented for 78 mother tongue speakers of Setswana. The aim of this experiment was to investigate whether or not (or to what degree) mother tongue speakers would have semantic associations on noun class prefixes connected to nonsense stems.

Asking a mother tongue speaker of Setswana what the «noun class meanings» are, or what the different noun prefixes «mean», does not yield much useful information. On a conscious level it seems that - apart from the rare cases of semantically transparent classes like 1/2 - the speakers themselves have little feeling that the classes may be semantically based. Such a situation could at first sight seem to support a claim that the Bantu noun classes are largely formal. But in my view there is no reason to be content with such a conclusion. Denny and Creider (1986:230) state that:

> The cognitive salience of classificatory systems is in general not great (in the sense that speakers are often unaware of the bases in terms of which classifiers are chosen), but a weak kind of saliency [...] may exist and result in the proper assignment of new vocabulary items to appropriate classes.

Although the speakers cannot give any explicit description of the semantics of the noun classes, one should thus not rule out the possibility that one might reveal parts of an unconscious knowledge, when faced with a task that involves spontaneous associations, rather than carefully weighed statements. Experiments that seek for such unconscious knowledge can be designed (c.f. Corbett 1991:89):

> The most obvious type of experiment to elucidate gender assignment is to present the native speaker with unfamiliar nouns (unfamiliar either because they are rare or because they are artificial nouns invented by the linguist) and to give a test, [...], to see which gender they are assigned to.

As an example of successful testing Corbett (1991:92) refers to a nonsense noun test[64] investigating the supposedly straightforward phonological assignment rules of Qafar genders:

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[64] constructed by R.J.Hayward. His results were given to Corbett by personal communication.

> The informant was able to produce the answer rapidly and in every case the gender assigned was that which is predicted by the assignment rules. Interestingly, he was very puzzled as to how he had done it, though he was well educated. *This suggests that even simple assignment rules do not operate at a conscious level.*
>
> (My italics.)

If speakers operate at an unconscious level even when dealing with rather «straightforward» systems, we can definitely not expect them to be conscious about less salient systems.

Corbett (1991:7-69) divides gender systems into semantic and formal systems. The formal systems are described as either phonological (as the Qafar example mentioned above) or as morphological as the Bantu nominal classes (genders). Concerning phonological systems, he is rather optimistic with regards to the possibility of obtaining useful information by experiments. The following quotation shows that his optimism does not apply to the morphological systems:

> For investigating morphological systems the problems involved in using invented forms are much worse; it is difficult to give the necessary information on the paradigm of an invented noun in a natural way. A variant of this approach was suggested by Greenberg (1962:173), namely to ask Bantu speakers who know European languages to assign genders to nouns from these languages, even though they have not been borrowed - an artificial borrowing experiment; results obtained by Richardson (1967:378-80) proved 'tantalizingly enigmatic'.
>
> (Corbett 1991:90)

Richardson's experiment was conducted with one informant only, and his treatment of the results implicitly indicates that the number of artificial borrowings that his informant had to deal with, was very low (Richardson 1967: 379-80). He states that "While some English words denoting abstract qualities or ideas, [...], were duly accommodated in the appropriate Bemba "abstract" class (*buu-* 14a), others were scattered over three classes (zero 9a, *ama-* 6, *buu-* 14a) [...]". He then goes into details considering the assignment of the English word 'vowel'. His informant first assigned this noun to the classes 1a/2a, but ended up alternating between the classes 9a/6 and 5/6. In my opinion his conclusion that "[...] the results proved as tantalizingly enigmatic as the situation they were intended to illuminate" can not be used as evidence for the impossibility of obtaining useful results from artificial borrowing experiments (or for that sake: nonsense word tests) considering his extremely sparse data. Until more convincing results are presented, I choose to regard tests of this type a possible

means for investigating unconscious associations that might shed light on the semantics of Bantu noun classes.

I suspect that the pessimism towards experiments of this type, stems partly from a widespread belief that there is not much semantics to detect in these systems, except for the traces of an earlier semantic system (cf. chapter 2 in this thesis), and partly from a more general scepticism towards experimenting as such (cf. for example Kiparsky and Menn (1977:64) who refer to a "«strangeness effect» which causes subjects' performance to deteriorate relative to their normal speech"). Expecting to find positive results of experiments is, of course, dependent upon believing that there *is* a semantic system that is still «alive».

Within the framework of cognitive grammar, one assumption is that speakers use their cognitive capacities to evaluate similarities of varying kinds, and to generalise over smaller and greater numbers of linguistic items, thereby «creating» increasingly more abstract schemas (c.f. Langacker 1987). This is considered a general process. Hence, a useful hypothesis that should be investigated, is that speakers of classifier languages like Setswana, generalise over large numbers of nouns, so that more or less abstract schemas emerge within each class, enabling the speakers to make use of (usually) unconscious associations when evaluating a «new» (borrowed or nonsense) term.

Most 'class schemas' (in the sense of the term that I have used in my analyses) represent highly abstract notions. As such they do not necessarily reflect the immediately most salient characteristic of a given concept. It should therefore come as no surprise that linguistic «knowledge» concerning these very abstract schemas is of a less conscious nature than the few salient «class schemas» (as the class 1/2 schema 'human being'). It is hardly speculative to claim that «being human» probably is a very salient characteristic of 'man' (*monna*), 'woman' (*mosadi*), 'visitor' (*moeti*), 'farmer' (*molemi*) etc., whereas it is much less obvious what a speaker would perceive as the salient characteristic of *lerôtsê* (a melon of a certain species): It may be the colour, the taste, the quality of being foodstuff etc. In addition to this, however, it is possible for the speaker to compare and make «similarity judgements» between great numbers of items on a higher level of abstraction. This may then lead to the establishment of abstract schemas (as 'roundish', 'non-individuability' etc.), even if usually not on a conscious level.

On this background one could presume that the noun prefixes (or more precisely: the concordial elements together with the noun prefix) should, if not «trigger», then at least favour certain meaning associations. In spite of the discouraging remarks of linguists like Richardson (1967) and Corbett (1991), I

have conducted a nonsense word test with the aim of revealing unconscious associations between certain class prefixes and a few selected meanings that would be compatible with certain schemas in my suggested semantic class networks.

In the following I will first comment briefly on a small pilot test, before I present the construction and layout of the final tests, as well as their practical execution. Then I will present and discuss the test results of each test. Lastly, I will sketch the more general conclusions that one might draw from the test results.

5.2. The pilot test

Before I started working with the noun classes, I carried out a three month study of general Setswana grammar at the University of Potchefstroom, South Africa. During that stay, I constructed and carried out two small nonsense word tests; one with 26 second and third year students and the other with 19 master students. All were mother tongue speakers of Setswana. The aims of the pilot test were:

1) to find out whether the subjects would be willing to respond to such tests, and understand how to respond according to my instructions, and

2) to investigate to what extent the answers would support my (at the time) few guesses about «class meanings».

The most important task was to explore whether a test based on nonsense noun roots would be feasible at all. Concerning the second point, I did not expect to find many useful answers, as the tests had been designed without the necessary hypotheses.

Two types of test items were constructed:

Type A): test items where «a full nonsense noun» (that is: a «real» prefix plus a nonsense root) was presented together with 5 alternative meanings. The subjects were asked to pick out one meaning for each nonsense noun.

Type B): test items where a nonsense root was presented without a prefix, and with *one* fixed meaning. The subjects were asked to add the prefix that they considered most suitable.

The nonsense nouns were constructed according to Setswana phonotactics[65], and were carefully examined by a fluent speaker (although not a

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[65] as it is described in Cole 1955.

Motswana)[66], to assure that they were not phonologically too close to any existing terms.

The meanings were given in English to avoid interference from concordial elements in Setswana phrases. (The students have a good mastery of English, so I did not consider the use of English a major problem.)

An overhead projector was used to present the test items, one at a time, and the subjects were instructed to answer in writing.

The first test was presented for one group of 21 second year students and one group of 5 third year students. The test consisted of 10 nonsense nouns. The first five items were of «type A»: The students were asked to choose among 5 alternative meanings for each nonsense noun. One of the meanings I suspected, on the background of Coles' grammar, to be easily associated with a certain class prefix. The other four meanings were supposed to be less good examples from the class. In the following example from the test, my hypothesis was that the prefix *se-* more easily would be associated with a kind of instrument, than with any of the other meanings:[67]

Example from the test (type A):

seratala
A. a kind of dish (food)
B. a kind of vehicle
C. a body part
D. a person who is performing a certain skill
E. a kind of instrument

The last five items were of «type B»: The students were asked to fill in a prefix (or none, as would be the case with class 9). Each meaning was assumed to be very typical for one specific class, so that one could expect most subjects to choose the prefix from that certain class.

Example from the test (type B):

__tsurô a type of bush

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66 Prof. S.A. Swanepoel.

67 As soon as I, on a later stage, started to systematise a relatively large noun sample, I realised that at least the meanings B and D could equally easily be combined with the prefix *se-* .

The next test was presented for 19 master students. It was designed in a similar manner, although modified according to the experiences of the first test. This time my Setswana professor, who's mastery of Setswana is close to mother tongue, assisted me in making up *one* very likely meaning and four, to his intuition, very unlikely meanings for each of the 6 nonsense nouns in the first part of the test (type A). I presented both the singular and the plural form of the nonsense nouns, because it is not possible to distinguish between the singular prefixes of class 1 and 3 (*mo-*). In the second part (type B), I chose to combine all 6 roots with an animal term, with the aim of searching for possible associations of a class prefixes to different types of animals (domestic, wild, small, big, different configuration etc.) This was done without any preconceived idea of possible associations.[68] I instructed the subjects to supply the plural prefix together with the chosen singular prefix, to avoid the problems of the *mo-* prefix (which is either a class 1 or a class 3 prefix) and the prefix-less class 9. Using «N-» for class 9 would clearly not be a good solution; there would always be doubts about the interpretation of a «blank», it could represent a «non-answer», but it could also mean that class 9 had been chosen, but that the subject had not seen the point of using «N-» (which would be very academic an «unnatural») in the answer.

I also instructed the subjects to respond even if they found all alternatives equally weird. In the first test the students had been given the opportunity not to answer, and that led to relatively many «blanks».

Finally I presented a type A test that I divided in two; one with the meanings given in English and the other with the meanings in Setswana. I presented the English version for one half of the master students and the Setswana version for the other half. I wanted to compare the answers, looking for possible indications that the Setswana phrases as predicted would «invite» the subjects to choose meanings according to similarities between the prefixes of the nonsense words and some prefixes or concordial elements used in the Setswana meanings.

The most important conclusion of the pilot test was that conducting a test with this design, is indeed possible. The subjects did not find it difficult to understand how to respond, although they found the nonsense nouns weird. Except for the

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[68] As mentioned in chapter 1, I eventually left out animals from my analyses of the classes that I treat, realising that this would be an impossible task without including an analysis of class 9 (sometimes referred to as the «animal class»).

most obvious cases, like choosing 'person' for a word beginning with mo-, or choosing mo- for the meaning 'person' (with le- and se- as second and third choice), I (in accordance with my expectation) didn't get many clear answers. However, the fact that they actually did respond as expected to the few «clear» cases like the combining of 'person' with mo- (or alternatively le- or se-) indicated that they had not been choosing blindly; they had tried to perform the test seriously.

I concluded that it would be possible to conduct a test with this design. However, a lot of things would have to be changed.

First of all, I could not of course make the test without having worked out rather clear hypotheses for the types of meanings associated with the different classes.

Secondly, while I would still present as one of the choices, the meaning or the prefix that I expected to be a good candidate for the full nonsense noun or the nonsense root respectively, I would have to be equally careful when selecting the other four alternatives. They should be good representatives for their own classes, instead of only vaguely being «not good candidates» for the class that I was investigating, as they were in the pilot test.

Thirdly, I could not expect to obtain useful answers unless only one parameter was changed at a time. In the pilot test I did not consequently keep to the same choices of meaning when investigating each prefix. Using one set of meanings when investigating one class prefix and another set of meanings (partly overlapping or totally different) when investigating another class prefix, makes it virtually impossible to evaluate the results.

Fourthly, I would have to test each combination of prefix and meaning several times, while only changing the nonsense root. If not, I would never be sure whether the test subjects had reacted to some association of the root rather than of the prefix.

Finally, I should restrict both the choice of meanings and prefixes to the 5 classes that I had selected for my thesis.

5.3. Construction of the final tests

The tests were restricted to dealing with the classes 3, 5, 6, and 7. However, I have also included the class 1 prefix. On the assumption that class 1 (human terms only) is completely semantically transparent to the speakers, one could expect that the subjects at least would show a clear preference for combining the class 1 prefix

with meanings referring to human beings. Failing to do so, would indicate that the subjects were answering completely blindly, without even *trying* to use their linguistic intuition. Hence, if I found no strong correlation between the class 1 prefix and meanings referring to humans, I could probably conclude that all test results were worthless, because the subjects had not taken the task seriously.

Test types

The final tests also consisted of nonsense items of the two types that I described in the preceding section, but with some modification of type B. The subjects were not given a free choice of prefix; this time they were presented with a meaning, and asked to choose among 5 alternative forms, that had a common nonsense root, but different prefixes (the prefixes of the classes 1, 3, 5, 6 and 7).

In this way it became clearer what the alternatives were, and it was the only way to make sure that the subjects kept to the prefixes that I wanted them to choose among.

Example:

a soft-drink	*setlhorape*	
	matlhorape	
	letlhorape	
	motlhorape	*(metlhorape)*
	motlhorape	*(batlhorape)*

The type A consisted, as in the pilot test, of a full nonsense noun (constructed of a «real» prefix plus a nonsense root) presented with five alternative meanings.

The reasons for keeping largely to the design of the pilot test was that:

1) such a test had proved successful in the sense that it seemed easy to make the test subjects perform the task,

2) performing the test was not very time consuming,

3) because the test can be formed as a written «cross off test», it is possible to test several individuals simultaneously, and

4) a «cross off» system means that systematising the results is possible without a lot of time consuming interpretations of more or less vague answers.

The advantage of such a test is then that it is possible to test a high number of subjects. Due to more or less diffuse answers from the pilot test, and the rather pessimistic comments in the literature as to the possibility of revealing a Bantu

class semantics, as well as problems connected to the «unnaturalness» of such testing, I did not expect to find only clear and unambiguous answers. I did, however, hope that above a possible «mass» of rather chaotic answers, there would be reflected some systematicity that could be used in evaluating my suggestions for some parts of the semantic networks. To be able to draw any conclusions at all, I felt that I needed a substantial number of subjects. Therefore I chose to give priority to forming a test that easily could be carried out with many subjects, rather than forming a test with a great variety of tasks that would imply time consuming interaction with every subject.

I constructed 8 tests with 90 single test items altogether, and organised them in a Part 1 and Part 2. The two parts were to be conducted on different occasions; responding to 90 items is clearly too much for a single session.

Test 1 (with altogether 20 test items) focus on constructed meanings that would instantiate the prototype schema of class 1, 3, 5, 6, and 7. Test 7 and 8 (with 20 test items in each) focus on constructed meanings that would instantiate less central schemas in the 5 classes.

The other tests were designed to investigate:

- the postulated prototypical character of the class networks (test 2, 3, and 4 - with 2 test items for each test),
- the fact that human terms can be found in different classes (test 5, with 16 test items), and
- how the subjects would react to constructed meanings that «invited to two different foci» (test 6, with 8 test items).

Of these tests I will only present and discuss test 5 here. The design of the 4 other small tests (2-4 and 6) for various reasons turned out to be failures. Hence, I have chosen to present these tests and their results in the appendix, together with comments on why I think that they were unsuitable.

The nonsense roots

The nonsense roots were constructed according to Setswana phonotactics (cf. Cole 1955), and controlled and adjusted by a mother tongue speaker (Simon Chilembo), to ensure that the phonological distance to other «real» items was large enough, and that the roots did not sound foreign or unnecessarily odd.

In my noun data base I had tagged the noun roots for both cv structure and end vowels. 51% were of a cvcv type, 25% were of a cvcvcv type, 17% were of a cvcvcvcv type, and the rest were small groups of different shapes. I constructed

the nonsense roots in accordance with these percentages of cv types, to make them appear as typical as possible.

I chose the end vowels of the nonsense roots equally carefully; using the actual distribution of end vowels within each noun class (from my sample) as patterns for the nonsense roots' end vowels.

5.4. Data collection

The tests were conducted with 78 mother tongue speakers in Gaborone, the capital of Botswana. The majority of test subjects were secondary school students between 16 and 19 years old; 44 from Gaborone Secondary School (GSS) and 25 from Maru A Pula. I also tested 9 adults between 22 and 53 years old, and of varying professions (a teacher, a receptionist, a housemaid, a gardener, a librarian, two secretaries and two university lecturers).

The GSS students were tested in five groups; four small groups of five students, and one large group of 24 students. With the exception of 2 students, all the GSS students took part in both the Part 1 and the Part 2 tests. The Maru A Pula students were collectively tested in their class. They were only taking part in the Part 1 test. The grown-ups were tested individually. 7 of the 9 took part in both the Part 1 and the Part 2 tests.

When introducing the subjects for the test, I emphasised that I was asking for their immediate *feeling* about the nonsense words, and that there were no «right» or «wrong» answers to the test items. They were urged to give an answer to *all* items, even when they did not feel that one alternative was any better than the others. They were also instructed that they were not allowed to make more than one choice for each test item. Finally, they were instructed to start with the first item and proceed without looking back at the earlier answers, and that there was no need for them to use a long time on each item, as it was their first immediate response I was interested in. As I was always present myself, I could check that they were following my instructions about the practical proceedings of the tests.

The test items were, as explained elsewhere, randomly distributed in the test, but they were ordered with respect of type A and type B. Half of the tests started with all the type A items, and the other half with all the type B items. This was primarily done to avoid that the same test items would suffer from the subjects' poorer concentration towards the end of the test, but it turned out to be a useful barrier towards a possible temptation to look at the responses of the neighboring student. I distributed the two variants of the test so that no student

sat next to another who started out with identical organisation of test items, something that made it virtually impossible to compare one's own answers to the answers of other subjects.

The subjects performed the tests by marking their choices with a text marker (or by ticking off the chosen item with a pen).

5.5. Presentation of tests and results

In the following I will present the tests 1, 5, 7, and 8 together with the results, and a discussion of these. A more general discussion is presented as a section of its own in the end of this chapter.

The results of the tests were incorporated into a database, resulting in 5860 records. The database has made it possible to combine different elements in such a way that I have been able to check possible differences between different groups of subjects (based on age, which school they attend, etc.). I have also been able to check for example if the nonsense roots (without regard to a prefix) have led to preferrals of certain meanings. As I have found no systematic correlations of these kinds, I have not included any such figures in the presentations below.

It is important to note that in the final test paper, all the test items were randomly distributed to ensure that it was impossible to find patterns that could influence the answers.[69] If, on the contrary, I had grouped together the five nonsense nouns based on the same root, but with different class prefixes and with the same five meaning alternatives, it would be possible for some subjects to answer on the clear assumption that they were to make a one-to-one link between nonsense forms and meanings. It would then have been impossible to judge when an answer had been given on the basis of genuine intuition, and when a subject had used a kind of «filling-in-the-gaps strategy»; combining some prefixes and meanings according to whether or not they had already been «used». The intermingling of test items, and the instruction that the subjects were to start with the first item, and then proceed without «jumping back or forth» (they were observed while performing the test), should have eliminated the possibilities of such «filling-in-the-gaps strategies».

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[69] See the final test paper in the appendix.

Part 1

5.5.1. Test 1

The first test aims at investigating the prototypical meanings of the five classes (1, 3, 5, 6 and 7). Since each meaning was constructed as a good example of one of the prototype schemas, my hypothesis was that more subjects than what could result from purely random choices, would choose a connection between a meaning «belonging to» a certain class schema and the prefix appropriate for that class.

The test meanings were formed on the basis of my hypotheses of the class prototypes at the time of constructing the tests. The only difference between those hypotheses and my final suggestion concerning class prototypes, is that the notion of 'non-individuability' has been added as a relevant aspect of the class 5 prototype. That notion has therefore not been reflected in the tests.

The test meanings of the first test were as follows:

'a person' (class 1, schema: 'human')
'a tree that grows in Europe' (class 3, schema: 'tree')
'a small, round ball' (class 5, schema: 'roundish')
'a soft-drink' (class 6, schema: 'liquid')
'a tool that is used for making soap' (class 7, schema: 'instrument')

Each class prefix (here: the class 7 prefix *se-*) was tested with two different nonsense roots, as in:

serutsa	a small, round ball
	a tree that grows in Europe
	a soft-drink
	a tool that is used for making soap
	a person
setsifo	a person
	a small, round ball
	a soft-drink
	a tree that grows in Europe
	a tool that is used for making soap

Each corresponding meaning (here: a «class 7 meaning») was also tested twice, with two other nonsense roots, as in:

a tool that is used for making soap	*mabôrôlêta*	
	lebôrôlêta	
	sebôrôlêta	
	mobôrôlêta	*(babôrôlêta)*
	mobôrôlêta	*(mebôrôlêta)*
a tool that is used for making soap	*motlhorape*	*(batlhorape)*
	letlhorape	
	matlhorape	
	motlhorape	*(metlhorape)*
	setlhorape	

In other words: the combination of a certain class prefix with a certain test meaning (here: the class 7 prefix *se-* and a meaning that is compatible with the schema 'instrument') was tested four times. This procedure was carried out for all the five classes, resulting in 20 single test items only to test these few presumed prototypical meanings. Forming the tests in this manner, meant that I could only test very few of my suggested schemas. In spite of this obvious limitation, I chose to form the tests like this, rather than risking not being able to draw *any* conclusions, because I could not control if the subjects had reacted more to associations of the root rather than of the prefix.

Results

I have presented the results in three tables: Table 2 shows the responses in terms of chosen meanings when the subjects were confronted with «full nonsense nouns» (real prefixes plus nonsense roots). The columns show how many times each meaning was chosen, when the subjects were presented with nonsense items attached to the prefixes that are shown in the upper row. The numbers are based on the responses of the two nonsense roots *-rutsa* and *-tsifo* . Table 3 shows the responses in terms of chosen forms (the only difference being the prefixes) when confronted with a certain meaning. The columns show how often each nonsense form (different real prefixes attached to the same nonsense root) was preferred, when the subjects were presented with the meanings that are shown in

the upper row. Here the numbers are based on the two nonsense roots *-bôrêlêta* and *-tlhorape* . Table 4 adds up the numbers from the two preceding tables.

The shaded cells mark the highest scores, whereas the cells marked with double lines show which combination of prefix and meaning that I expected to be chosen most frequently.

The last row gives the results of a significance test conducted by Grete Usterud Fenstad.[70] Only the results of the *expected* most frequent choices (the numbers in the double lined cells) were tested for significance. If the p-value is smaller than 0.01, the number of responses is significant in the sense that the result can not be attributed to chance (statistically random distribution of answers). (See appendix 3 for an explanation of the mathematical method used.)

It will become clear below, that the results of the significance test is valuable only to a certain degree. The test was carried out based on a «zero hypothesis» that the subjects had responded by pure guessing (which would have led to a statistically level spreading of answers over the alternative choices). Accordingly, the results of the significance test is suitable to answer the general question of whether or not one can claim that the subjects have made use of (possibly unconscious) semantic associations when dealing with the test items. In some cases, however, it seems that the subjects have chosen to disregard the class 1 and class 6 prefix/meaning. On the assumption that they have made use of semantic associations, that is not surprising: It would be a reasonable hypothesis that both class 1 members (humans) and class 6 members (non count concepts) differ from the other class' members in semantic saliency (exhibiting a higher degree of saliency). Actually some of the test results below seem to support such a hypothesis. In some cases, then, when the subjects have more or less completely ruled out class 1 and 6, and the choice between the other three alternatives has resulted in a very level spreading of answers, the significance test will still give a positive result (i.e. the p-value will be smaller than 0.01) if the expected choice were one of the other classes (not 1 or 6). Therefore one has to exercise caution when dealing with the results of the significance test.

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The results of test 1 is presented in the two tables below:

	1 (mo- ba-)	3 (mo- me-)	5 (le-)	6 (ma-)	7 (se-)	total:
person	116 (76%)	8 (5%)	33 (22%)	33 (22%)	22 (14%)	212
tree	9 (6%)	46 (30%)	22 (15%)	25 (16%)	17 (11%)	119
ball	9 (6%)	11 (7%)	31 (21%)	12 (8%)	24 (16%)	87
drink	7 (5%)	46 (30%)	26 (17%)	50 (33%)	29 (19%)	158
tool	12 (8%)	42 (27%)	39 (26%)	32 (21%)	61 (40%)	187
total:	153	153	151	152	153	
p-value :	$p \approx 0$	$p = 0.0009$	$p = 0.435$	$p \approx 0$	$p \approx 0$	

Table 2. From form to meaning, test 1.

	person	tree	ball	drink	tool	total:
1 (mo- ba-)	125 (81%)	3 (2%)	3 (2%)	5 (3%)	1 (1%)	137
3 (mo- me-)	12 (8%)	64 (41%)	18 (12%)	37 (24%)	28 (18%)	159
5 (le-)	13 (8%)	20 (13%)	83 (54%)	34 (22%)	51 (33%)	201
6 (ma-)	0	3 (2%)	6 (4%)	5 (3%)	12 (8%)	26
7 (se-)	5 (3%)	66 (42%)	44 (29%)	73 (47%)	62 (40%)	250
total:	155	156	154	154	154	
p-value:	$p \approx 0$	$p \approx 0$	$p \approx 0$	$p \approx 1.0$	$p \approx 0$	

Table 3. From meaning to form, test 1.

In general I expected the answers to the form-to-meaning test items (Table 2) to be more levelled out, as compared to the meaning-to-form items (Table 3). In the meaning-to-form tasks I have already forced upon the subjects a connection between a certain nonsense root and a certain meaning, thereby leaving only the prefixes for them to choose among. This, I believe, should put more focus on the relation between the prefixes and the meanings, than what is possible in the form-to-meaning tasks. When a nonsense root plus a prefix is to be connected to one of several alternative meanings, the risk that it is the combination of the root and a certain meaning that is focused, is clearly present.

The class 1 prefix *mo-* (*ba-*) and the meaning 'a person'

Table 2 and 3 above show a significant tendency to connect the meaning 'person'[71] and the class 1 prefix. Given the exceptionally homogeneous semantic content of class 1, this was of course expected. The whole point of integrating the class 1 prefix and a "class 1 meaning" into the test, was merely to control whether or not the subjects had understood the task and were willing to respond seriously. No significant correlation between the class 1 prefix and the meaning 'person' would have indicated that the subjects had selected their answers by mere chance. It can, however, be seen that they must have used their intuition (or for that sake: their knowledge, as most Batswana would be able to state that a noun with the prefix *mo-* (+ pl.:*ba-*) refers to a human being, and that the most typical prefix used in nouns referring to a human being is *mo-* (+ pl.:*ba-*)). Responding according to the predictions to the only obvious case, indicates that the subjects really have tried to deal with the whole task in a serious manner.

The class 3 prefix *mo-* (*me-*) and the meaning 'a tree that grows in Europe'

From form to meaning:

Table 2 shows that a significant 30% of the subjects select 'tree' when they are confronted with a nonsense noun with the class 3 prefix.

Although the number of subjects selecting 'tree' is significant when taking all response possibilities into account, 'tree' does not represent a clear first choice. Both 'tree' and 'drink' are selected by 30%, and 'tool' by 27%.

The choice of 'tool' is by no means as surprising as the choice of 'drink'. It is very difficult to conceive of a tool without a configuration. Since class 3 can be characterised partly as a «configurational class» (for long items), it is virtually impossible to guard against subjects reacting on the basis of configuration rather than on the basis of function.

The 'drink' response, however, is puzzling. As we shall see below, the expected connection between the meaning 'soft-drink' and the class 6 prefix turned out to be clearly problematic. Anticipating the course of events, my interpretation is that 'soft-drink' probably has been an unfortunate test item; the subjects might not have imagined a liquid (as I wanted them to), but rather focused on the usual appearance of soft-drinks, namely tins and bottles or the like. It is also possible that 'soft-drink' is favoured simply because it refers to

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[71] In the following I will use the same abbreviated versions of the «test meanings» as I use in the tables.

«stuff» that often has strange names. The other choices of meaning are better candidates for «normal» Setswana names; hence harder to connect to the unfamiliar nonsense terms.

The relation between the meanings 'tree' and 'ball' is of particular interest. While 'tree' receives the already mentioned 30% of the answers, 'ball' receives only 7%. In my analysis I claim that one of the oppositions between typical class 3 members and typical class 5 members is configurational ('long' and 'roundish'). Accordingly, they should be rather easily kept apart in the test results, given that the test items invite the speakers to «use» configurational associations (conscious or unconscious). The test responses suggest such a «barrier» between the two classes.

From meaning to form:
Table 3 shows a similar asymmetrical response between the class 3 prefix (chosen by a significant 41%, and the class 5 prefix (13%).

The only unexpected response in Table 3 is represented by the class 7 prefix. That this prefix is chosen by 42% of the subjects can not be a result of accidental choices; in fact slightly more subjects choose the class 7 prefix than the class 3 prefix which have been shown to be significant. The class 3 and the class 7 prefixes together represent 83% of the answers. The only possible reason for the high score of the class 7 prefix that I can think of, is that the subjects have been influenced by a «*setlhare* -effect». As will be remembered from chapter 4, the generic term for tree is not a class 3 noun, but the class 7 noun *setlhare*. I think that this might have led the subjects to choose according to the phonology of the generic term, overriding the fact that virtually all names of trees are class 3 nouns. An incident that supports this assumption, is that one of the subjects actually wrote *setlhare* next to the test item *setlhorape* . The root *tlhorape* is too close to the real root *tlhare* to be a good test item.

The class 5 prefix *le-* and the meaning 'a small, round ball'[72]
From form to meaning:
When the subjects are presented with a nonsense form with the class 5 prefix (Table 2), they do not clearly favour any of the meanings, nor do they rule out

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72 At the time of constructing the tests, I had not yet come to the conclusion that 'non-individuability' also is «present» in the prototypical schema. Accordingly, the test meaning does not reflect that notion.

any. The choices are rather level; ranging from 15% ('tree') to 26% ('tool'). The number of subjects selecting the expected 'ball' (21%) is not significant.

From meaning to form:
When, on the contrary, they are presented with the meaning 'ball' (Table 3), they strongly favour the class 5 prefix *le-* (54%), a result that is significant. Further in Table 3 we see that the class 7 prefix makes the second choice, with it's 29% . I had reasons to expect this to be the second choice, as 'ball' could be a rather good instantiation of the class 7 schema 'paricipation in action'. The class 1 and the class 6 prefixes are practically ruled out, with 2% and 4% respectively, while the class 3 prefix gets 12 %. Again we see that the difference between the choice of the class 3 and the class 5 prefix is striking; the class 5 prefix is chosen 4 1/2 times as often as the class 3 prefix. The result meets the expectation that a semantic item like 'a small, round ball' more easily will be associated with the class 5 prefix *le-* than with the class 3 prefix *mo-* (*me*).

The assumption that the form-to-meaning test items lead to a higher rate of accidental answers than the meaning-to-form items do, is clearly born out in testing the combination of 'ball' and the class 5 prefix, as the difference between the answers in Table 2 and Table 3 is striking.

The class 6 prefix *ma-* and the meaning 'a soft-drink'
From form to meaning:
Confronted with the form-to-meaning test items (Table 2), the subjects show a clear tendency to favour 'drink' (33% which represents significance).

Concerning the connection between the class 6 prefix and the other meanings, I suspect that the subjects have interpreted the class 6 prefix as the plural - and not the non-count - prefix. The plural class 6 prefix is used regularly for singular class 5 items, but in addition it serves as a collective plural for nouns from other classes. Thus, «class 5 persons» and «class 5 tools» would take the class 6 prefix in the plural. Names for trees, as class 3 notions, are usually given the class 4 prefix (*me-*) in the plural, but referring to thickets of trees the class 6 prefix may be used.

From meaning to form:
The picture is drastically altered when focusing on the meaning-to-form items (Table 3). When responding to 'drink', the subjects for whatever reason practically rule out the class 6 prefix (it is selected by only 3%, which of course is not

significant). It is, however, worth noting that the class 6 prefix gets extremely low scores whatever «test meaning» that is in focus. The scores range from 0 to 8%, indicating that the subjects did not feel any of the meanings to be good «class 6 candidates». That was, of course, expected for the meanings 'person', 'tree', 'ball' and 'tool', but not for the meaning 'soft-drink'. I believe that this response indicates rather strongly that 'soft-drink' has been an unfortunate item. I might not have been able to direct the subjects' attention towards the *liquid* itself, but rather towards the usual appearance of soft-drinks: the tins and bottles that usually contain the drink.

The subjects show a marked preference for the class 7 prefix (47%). The reason remains unclear, except that the subjects could have been influenced by terms like *seno tsididi* (cold drink) or *seela* (liquid). Both *seno* and *seela* are nominalisations of verbs, consisting of the class 7 prefix *se-* plus the verbal roots (phonologically modified in the case of *seno*) for 'drink' and 'flow'.

The class 7 prefix *se-* and the meaning 'a tool that is used for making soap'

Except for the unproblematic relationship between the class 1 prefix and the meaning 'person', it is only the combination of the class 7 prefix and the meaning 'tool' that is chosen most frequently *both* in the form-to-meaning and meaning-to-form tests.

From form to meaning:

A significant 40% of the subjects favour 'tool', when they have to deal with a nonsense noun with the class 7 prefix. The second choice is given by 19%; less than half of those that choose 'tool'. Except from 'tool' as the significant first choice, Table 2 shows a rather level spreading of the other alternatives.

From meaning to form:

Again, a significant 40% of the subjects favour the class 7 prefix *se-* when they are confronted with the meaning 'tool'. This time it is the class 5 prefix that constitutes the second choice, with 33% of the answers.

The alternative choices in Table 3 are less level than those in Table 2. That both the class 3 and the class 5 prefixes are chosen by quite a number of subjects, is rather natural, when we consider what I have pointed out earlier about tools and configuration. But it remains counterintuitive that the class 5 prefix score so much higher than the class 3 prefix; I would rather have expected the opposite, as I conceive the typical shape of a tool to be long rather than roundish.

The most striking response pattern for the whole of Test 1 is obtained by adding up the numbers for all chosen combinations of prefixes and meanings, including both the form-to-meaning tasks and the meaning-to-form tasks. That has been done in Table 4. Each cell in the table represents the correlation between a certain meaning and a certain noun class (represented by the prefixes). The cells with double lines mark the expected combinations, and the shaded cells mark the combinations that were chosen most frequently. The pattern that emerges show that the overall tendency is to favour the expected combinations of prefixes and meanings.

person/cl.1 **241**	person/cl.3 **20**	person/cl.5 **46**	person/cl.6 **33**	person/cl.7 **27**
tree/cl.1 **12**	tree/cl.3 **110**	tree/cl.5 **42**	tree/cl.6 **28**	tree/cl.7 **83**
ball/cl.1 **12**	ball/cl.3 **29**	ball/cl.5 **114**	ball/cl.6 **18**	ball/cl.7 **68**
drink/cl.1 **12**	drink/cl.3 **83**	drink/cl.5 **60**	drink/cl.6 **55**	drink/cl.7 **102**
tool/cl.1 **13**	tool/cl.3 **70**	tool/cl.5 **90**	tool/cl.6 **44**	tool/cl.7 **123**

Table 4. Correlations between meaning and class, test 1.

5.5.2. Test 5

In this test I was looking at the distribution of human terms over the classes 1, 5 and 7. The test includes one «neutral» meaning ('a person who is working in a car factory') expected to be treated as a class 1 term (with *mo-*), one «expert» kind of meaning ('a person who is an expert in a special way of dancing'), that I, at the time of constructing the tests, thought was the «typical class 7 person» (with the prefix *se-*). The combination of the class 5 prefix (*le-*) and a certain type of meaning represented a problem, because I had seen, not one, but three typical groups: the negative, the small/immature and many ethnic groups. I chose to represent all of them in order to see if any one was chosen with significantly higher frequency, or if they would be levelled out ('a very stupid person', 'a very small child', 'a person from a foreign nation'.) The class prefix attached to a nonsense root was tested twice with two different nonsense roots.

Example (test type A):

seatêpha	a person who is working in a car factory
	a very stupid person
	a person who is an expert in a special way of dancing
	a person from a foreign nation
	a very small child

Each of the five meanings were also tested with two different nonsense roots. The choice of nonsense form was this time limited to the three items that would be compatible with the forms of class 1, class 5 and class 7, as in the following example:

a very stupid person	*sethephima*	
	lethephima	
	mothephima	*(bathephima)*

Results

From form to meaning:

	1 (mo- ba-)	5 (le-)	7 (se-)	total:
working	22 (14%)	12 (8%)	9 (6%)	43
small	9 (6%)	16 (10%)	14 (9%)	39
stupid	42 (27%)	71 (46%)	81 (53%)	194
foreign	51 (33%)	33 (21%)	11 (7%)	95
expert	29 (9%)	22 (14%)	39 (25%)	90
total:	153	154	154	
p-value:	p = 0.959	p ≈ 0	p = 0.049	

Table 5: From form to meaning, test 5.

working ->	a person who is working in a car factory
stupid ->	a very stupid person
expert ->	a person who is an expert in a special way of dancing
foreign ->	a person from a foreign nation
small ->	a very small child

Presenting the subjects with class 1 nonsense terms did not lead to the expected result; the apparently «neutral» meaning 'a person who is working in a car factory' was selected by only 14% which is not significant. Instead many preferred 'a person from a foreign nation' (33%) and 'a very stupid person' (27%).

Of all the three meanings equally expected for forms with the class 5 prefix, it is 'a very stupid person' that is most frequently chosen (46%).

When the subjects had to deal with nonsense forms with the class 7 prefix, only 25% (which is not significant) chose the expected meaning 'a person who is an expert in a special way of dancing'. The first choice 'a very stupid person' got 53%. Although I originally had expected a majority of the subjects to choose 'expert', both answers are in accordance with my present analysis of the class 7 network. Why so many more subjects have preferred 'stupid' to 'expert', I am not able to explain, though, unless it is easier to imagine naming fools with strange names, while one perhaps would expect a reminiscence of *go bina* (to dance) in a form meaning 'a person who is an expert in a special way of dancing'.

Looking at the whole table, it seems that many subjects have avoided the two notions 'a person who is working in a car factory' (the expected «class 1 meaning») and 'a very small child'. It is perhaps more difficult to connect such «everyday language» notions to strange nonsense items, than it is to connect the other three more «marked» meanings to the nonsense words. If this is the case, the subjects are left with the meanings 'stupid', 'foreign' and 'expert' from which to choose. 'Foreign' is probably the least «marked» of these three meanings, hence the best candidate for class 1.

From meaning to form:

	working	small	stupid	foreign	expert	total:
1 (mo- ba-)	96 (62%)	74 (48%)	21 (13%)	118 (77%)	35 (23%)	344
5 (le-)	34 (22%)	55 (36%)	34 (22%)	33 (21%)	9 (6%)	165
7 (se-)	24 (16%)	25 (16%)	101 (65%)	3 (2%)	111 (72%)	264
total:	154	154	156	154	155	
p-value:	$p \approx 0$	$p = 0.265$	$p = 0.999$	$p = 0.999$	$p \approx 0$	

Table 6: From meaning to form, test 5.

Table 6 above shows that for each meaning one prefix is more or less clearly preferred, although in three of the five cases it is not the prefix that I originally had expected as a first choice. The pattern that emerges is one where the subjects tend to distribute the different meanings between class 1 and class 7. Of course, as class 1 can be regarded as the «default class» for human beings, it can hardly be surprising that it is the class 1 prefix that is chosen most frequently (altogether it is chosen 344 times, while the class 7 prefix is chosen 264 times and the class 5 prefix 165 times). The interesting point though, is that for the two meanings 'very stupid' and 'expert' most subjects seem to «agree» that class 1 is not suitable; 65% treat 'very stupid' as a class 7 noun, and 72% treat 'expert' as a class 7 noun. (The other possibilities are given from 6 to 23% of the answers.)
The only originally expected choices that have been selected by a significant number of subjects, are the class 1 prefix for the meaning 'working' and the class 7 prefix for the meaning 'expert'.

As I do not any longer consider small size or immaturity as such to be class 5 schemas (to the extent that human beings with such characteristics are found in class 5, it is rather because of their «non-individuated» character), I am not surprised that more subjects prefer this notion to be associated with class 1 than with class 5, especially because the meaning itself is not «marked».

Even if there is no «rule» that foreigners or other ethnic groups are given class 5 names, it is so usual that I find it rather surprising that there is not a more level distribution between choosing the class 1 prefix (77%) and the class 5 prefix (21%).

If I am right that 'non-individuability' represents a class schema that connects most class 5 personal terms, it makes great sense that the subjects more or less have rejected the class 5 prefix which represents a kind of de-focusing on the individual and rather distributed their choices between the «default class» and the more «action related class»

There is a tendency in the language that some «class 5 persons» are moving to class 1.[73] It would have been interesting to investigate whether or not a group of very old subjects would have made more use of the class 5 prefix, than the mostly very young subjects that I have used, did.

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[73] I do not know the extent of this phenomenon, and it falls outside the scope of this thesis.

Part 2

The Part 2 was also presented to the majority of the subjects. It consisted of two more tests (7 and 8) of the same type as the first test in Part 1, but this time aiming at investigating less central schemas. The idea was that this second test were to be presented for the same subjects, if the first test from part 1 showed any interpretable patterns. If, on the contrary, the answers to this first test based on the most central or prototypical notions were totally unintelligible, there would be no sense in presenting the last part, since that was constructed on the basis of less central groups of notions.

As each of the five constructed meanings in these tests, as well as each of the five prefixes attached to a nonsense root, were tested twice, each of these two tests consisted of 20 test items.

5.5.3. Test 7

In this test I let the following meanings be representatives of schemas within the five classes:

'a person who is working with boats' (class 1, schema: 'human being')

'a long thin line' (class 3, schema: 'long objects/phenomena')

'the round part of an animal's back-leg' (class 5, schema: 'paired, roundish body parts')

'the kind of things that are kept in a box' (class 6, schema: 'unspecified concrete objects')

'a thing that a chief holds in his hand during a religious ceremony' (class 7, the original schema was: 'other artifacts' i.e. «non instrumental», which is no longer relevant in my suggestion for a class 7 network. The meaning would be an example of 'instrument' in my present suggestion for network.)

As in test 1, I tested the combination of a certain class prefix and a certain meaning (compatible with one of the schemas in the semantic network of the class in question) four times; twice with the test type A and twice with the test type B. Consider the following example of testing the combination of the class 3 prefix *mo-* and the schema 'long objects/phenomena':

motsêrô *(metsêrô)* - a thing that a chief holds in his hand during a religious ceremony
- the kind of things that are kept in a box

- a person who is working with boats
- a long thin line
- the round part of an animal's back-leg

mokorite (mekorite)
- a thing that a chief holds in his hand during a religious ceremony
- a person who is working with boats
- a long thin line
- the kind of things that are kept in a box
- the round part of an animal's back-leg

a long, thin line
- *-moforobêta (meforobêta)*
- *maforobêta*
- *seforobêta*
- *leforobêta*
- *moforobêta (baforobêta)*

a long, thin line
- *sefêô*
- *mofêô (mefêô)*
- *lefêô*
- *mafêô*
- *mofêô (bafêô)*

Results

From form to meaning:

	1 (mo- ba-)	3 (mo- me-)	5 (le-)	6 (ma-)	7 (se-)	total:
person	81 (84%)	14 (14%)	13 (13%)	12 (12%)	15 (15%)	135
line	1 (1%)	20 (20%)	31 (32%)	9 (9%)	14 (14%)	75
round leg	6 (6%)	20 (20%)	24 (24%)	8 (8%)	18 (19%)	76
things (box)	7 (7%)	21 (21%)	14 (14%)	59 (60%)	8 (8%)	109
rel. thing	2 (2%)	23 (23%)	16 (16%)	10 (10%)	42 (43%)	93
total:	97	98	98	98	97	
p-value:	$p \approx 0$	$p = 0.460$	$p = 0.133$	$p \approx 0$	$p \approx 0$	

Table 7: From form to meaning, test 7.

person ->	a person who is working with boats
line ->	a long thin line
round leg ->	the round part of an animal's back-leg
things (box) ->	the kind of things that are kept in a box
rel. thing - >	a thing that a chief holds in his hand during a religious ceremony

In Table 7 one can see that 3 of the 5 expected choices have been selected by a significant number of subjects: As much as 84% selected 'a person who is working with boats' when dealing with nonsense items with the class 1 prefix.

The class 6 prefix also seems to lead to a strong favouring of the expected meaning. A significant 60% choose the expected 'the kind of things that are kept in a box'. Unfortunately though, this class 6 meaning is clearly a mishap; the use of the English plural makes it impossible to draw any conclusions whatsoever, as the subjects are probably led to react to the class 6 prefix as the plural and not as the non count prefix.

That leaves us with only one significant answer apart from the obvious case of class 1; the selection of 'a thing that a chief holds in his hand during a religious ceremony' when the class 7 prefix is used. 43% has chosen that alternative, which is more than twice as many as those who chose the second alternative.

The answers concerning class 3 and class 5 are too level to represent any useful information.

From meaning to form:

	person	line	round leg	things (box)	rel. thing	total:
1 (mo- ba-)	68 (69%)	1	4	3	0	76
3 (mo- me-)	3	43 (44%)	26	38	23	133
5 (le-)	13	33	31 (32%)	4	30	111
6 (ma-)	3	4	2	42	1	52
7 (se-)	11	17	34	10	44 (45%)	116
total:	98	98	97	97	98	
p-value:	$p \approx 0$	$p \approx 0$	$p = 0.0016$	$p \approx 0$	$p \approx 0$	

Table 8: From meaning to form, test 7.

When the subjects respond to the meanings (Table 8), the responses are not quite as level. There is a tendency that the expected prefixes have been chosen.

The meaning 'person' as usual leads to a significant number of subjects choosing the class 1 prefix (69%).

Comparing the class 3 and class 5 meanings ('line' and 'round leg'), we see that the combination of meaning and class prefix show a tendency towards the expected choices, although the differences are not striking. The significance test based on a zero hypothesis of random spreading of answers on all five alternatives, however, show that both in the case of the class 3 meaning and the class 5 meaning, the expected prefixes have been chosen by a significant number of subjects, 44% and 32% respectively. The answers clearly show that we have to reject the zero hypothesis, but concerning the class 5 meaning we are not left with a *clear* preference of the expected choice, since it is mostly the rejecting of the class 1 and the class 6 alternative that leads to result that the expected choices are chosen by a significant number of subjects. The choice between the remaining three options are in fact quite level.

The results of the class 6 meaning do not, for reasons mentioned in the preceding section, give any useful information.

The class 7 meaning shows a preference for the expected choice; a significant 45% of the subjects select the class 7 prefix.

The complete correlation of meanings and classes are presented in Table 9. Again we see a tendency towards favouring the expected choices:

person/cl.1 **149**	line/cl.1 **15**	round /cl.1 **17**	in box/cl.1 **15**	relig./cl.1 **15**
person/cl.3 **4**	line/cl.3 **63**	round/cl.3 **57**	in box/cl.3 **47**	relig./cl.3 **37**
person/cl.5 **19**	line/cl.5 **53**	round/cl.5 **55**	in box/cl.5 **12**	relig./cl.5 **48**
person/cl.6 **10**	line/cl.6 **25**	round/cl.6 **16**	in box/cl.6 **101**	relig./cl.6 **9**
person/cl.7 **13**	line/cl.7 **40**	round/cl.7 **50**	in box/cl.7 **20**	relig./cl.7 **86**

Table 9. Correlations between meaning and class, test 7.[74]

5.5.4. Test 8

In this test, the following meanings representing various schemas, were tested:

'a person who is behaving well' (class 1, schema: 'human being')
'a dress that is made of skin' (class 3, schema; 'body-coverings made of skin')
'a big, round meeting-room' (class 5, schema: 'roundish enclosures/locations')
'the state of being a little bit tired' (class 6, schema: 'states')
'a worn-out dress' (class 7, schema: 'objects affected by action')

The example shows the testing of class 5:

lekesele - a big, round meeting-room
- a worn-out dress
- a dress that is made of skin
- a person who is behaving well
- the state of being a little bit tired

---

[74] Person = a person who is working with boats. Line = a long, thin line. Round = the round part of an animal's back-leg. In box = the kind of things that are kept in a box. Relig. = a thing that a chief holds in his hand during a religious ceremony.

lekathe - a dress that is made of skin
- a big, round meeting-room
- a worn-out dress
- the state of being a little bit tired
- a person who is behaving well

a big, round meeting-room
- *makgotepha*
- *lekgotepha*
- *sekgotepha*
- *mokgotepha (bakgotepha)*
- *mokgotepha (mekgotepha)*

a big, round meeting-room
- *lekugôthêbô*
- *mokugôthêbô (bakugôthêbô)*
- *makugôthêbô*
- *sekugôthêbô*
- *mokugôthêbô (mekugôthêbô)*

Results

From form to meaning:

	1 (mo- ba-)	3 (mo- me-)	5 (le-)	6 (ma-)	7 (se-)	total:
person	82 (84%)	8 (8%)	17 (17%)	8 (8%)	8 (8%)	123
skin-dress	5 (5%)	47 (48%)	25 (26%)	27 (28%)	26 (27%)	130
room	1 (1%)	13 (13%)	17 (17%)	22 (22%)	14 (15%)	67
state	4 (4%)	4 (4%)	13 (13%)	14 (14%)	17 (18%)	52
worn dress	6 (6%)	26 (27%)	26 (27%)	27 (28%)	30 (32%)	115
total:	98	98	98	98	95	
p-value:	$p \approx 0$	$p \approx 0$	$p = 0.744$	$p = 0.921$	$p = 0.002$	

Table 10: From form to meaning, test 8.

person -> a person who is behaving well
skin-dress -> a dress that is made of skin
room -> a big, round meeting-room
state -> the state of being a little bit tired
worn dress -> a worn-out dress

The next bulk of test meanings has led to less clear answers. The only potentially interesting answers are represented by the responses concerning the two meanings involving 'dress'. The problem with these constructed meanings is that one might not be testing the notions 'skin' and 'worn-out' (which are the reasons for claiming that the meanings could fit with class 3 and 7 respectively), but rather the shared notion 'dress'. (The Setswana term for a dress is *mosese* (class 3).) However, in Table 10 above we see that the distribution of answers concerning these two meanings show a significant tendency (48%) towards choosing 'skin dress' as the class 3 meaning (as expected), and also a significant tendency (32%) towards choosing 'worn-out dress' as the class 7 meaning, (as expected).These facts indicate that apart from reacting upon the 'dress' part of the meaning, the subjects probably have been influenced by the «modifying element».

The expected choices concerning the class 5 and the class 6 prefixes have not been selected by a significant number of subjects; the meaning 'round room' (class 5) was chosen by only 17%, and 'state' (class 6) was chosen by only 14%.

The meaning 'person' was as usual chosen by a significantly high number of subject (84%) when dealing with items with the class 1 prefix.

From meaning to form:

	person	skin-dress	room	state	worn dress	total:
1 (mo- ba-)	53 (54%)	4 (4%)	2 (2%)	3 (3%)	3 (3%)	65
3 (mo- me-)	10 (10%)	54 (55%)	35 (36%)	6 (6%)	43 (44%)	148
5 (le-)	15 (15%)	15 (15%)	32 (33%)	45 (46%)	31 (32%)	138
6 (ma-)	3 (3%)	4 (4%)	3 (3%)	16 (16%)	6 (6%)	32
7 (se-)	17 (17%)	21 (21%)	26 (27%)	28 (29%)	15 (15%)	107
total:	98	98	98	98	98	
p-value:	$p \approx 0$	$p \approx 0$	$p = 0.0009$	$p = 0.818$	$p = 0.877$	

Table 11: From meaning to form, test 8.

When the meanings are the starting point (Table 11), the picture changes slightly. Now, we see an indication that 'dress' has led to the choice of the class 3 prefix in both variants ('made of skin' or 'worn-out'). A significant 55% of the subjects choose the class 3 prefix as the response to the meaning 'skin dress', but only an insignificant 15% chose the class 7 prefix when reacting on 'worn dress'.

The usual significant connection between 'person' and the class 1 prefix show up again; 54% choose that, although is also possible for personal nouns to have the class 5 and 7 prefix (and in some rare cases even the class 3 prefix).

The number of class 5 prefix responses to 'round meeting-room' (33%) are significant as far as the distribution of answers over all 5 alternatives is concerned, but leaving the class 1 and class 6 option aside gives a different picture: The choices between the remaining 3 alternatives are very level.

Lastly, I do not have any suggestions for the tendency to prefer the class 5 prefix for a 'state', rather than choosing the expected class 6 prefix. Only insignificant 16% chooses the class 6 prefix.

The complete correlation of meanings and classes are presented in Table 12. This time there is no strong tendency towards favouring the expected choices.

person/cl.1 **135**	skin-d./cl.1 **12**	room/cl.1 **19**	state/cl.1 **11**	worn d./cl.1 **11**
person/cl.3 **15**	skin-d./cl.3 **101**	room/cl.3 **60**	state/cl.3 **33**	worn d./cl.3 **69**
person/cl.5 **16**	skin-d./cl.5 **28**	room/cl.5 **49**	state/cl.5 **67**	worn d./cl.5 **45**
person/cl.6 **7**	skin-d./cl.6 **8**	room/cl.6 **16**	state/cl.6 **30**	worn d./cl.6 **23**
person/cl.7 **23**	skin-d./cl.7 **47**	room/cl.7 **52**	state/cl.7 **55**	worn d./cl.7 **45**

Table 12. Correlations between meaning and class, test 8.[75]

The results of these tests (7 and 8) confirm my prediction that the less central notions would be more difficult to test in this way, than the apparently prototypical notions in test 1.

[75] Person = a peson who is behaving well. Skin-d. = a dress that is made of skin. Room = a big, round meeting-room. State = the state of being a litle bit tired. Worn d. = a worn-out dress.

5.6. Discussion

Here I will attempt to outline what we can conclude from the test results.

We have seen that the tendency towards choosing the expected alternatives in some of the tests is large enough to conclude that at least we have to rule out the possibility that the Setswana noun classes constitute a purely formal system. This, however, is hardly controversial. A common stand, also among those who tend to play down the role of semantics in the Bantu noun classes, is that even within mainly formal systems there is usually still a kind of semantic «core». Corbett (1991:8), who treats the Bantu genders (noun classes) as 'formal morphological systems', still claim that: "In a sense all gender systems are semantic in that there is always a semantic core to the assignment system."

It would, then, be more interesting if my test results could lead to any conclusions about *what kind of* semantic structures that the noun classes represents, as well as the position or importance of the semantics within these systems. As we shall see, these questions can hardly be *fully* answered by the test results. The results are, however, compatible with representing each noun class as a *system of several abstract (generalised) schemas where some are more central than others*. To a certain degree, they even indicate that this probably is a better way of understanding the noun class semantics, than any of the other possible positions that I will discuss below. The test results also represent a good starting point for further investigation, as they clearly indicate that it is possible to use methods like this in revealing the semantics of the noun classes.

Are the noun classes semantically or formally based?

If the classes were exclusively formally based, one could predict that the test results would exhibit a statistically random distribution of answers. However, the significance-testing of the obtained results, shows in a convincing way that this is not the case: The results of most tests clearly represent a high degree of *non-random distribution* of answers. Accordingly, we have to conclude that to a certain degree the noun classes are semantically based.

It is interesting to note that all subjects whom I asked about their feelings about the tests (after the test sessions), answered that they had no intuition about the alternative choices. One person said she knew that tree names begin with *mo-* (the class 3 prefix), but that all the other items were equally strange. All others whom I asked (on a very informal basis) said that none of the alternative choices were any better than the others. The test results, however, reveal that their

responses must have been based on systematic associations, at least to a certain degree.

What is the nature of the «class semantics»? Is it better understood in terms of complex bundles of properties (kinds), or in terms of relatively simple, abstract categories?

This complex question focuses on the *character* of the semantic group(s)[76] that constitute the semantics of each class.

The implicit claim that many Bantu grammarians make is that the semantics (if any) is describable in terms of «natural classes of entities» (examples of such entities would be 'plants', 'body parts', 'tools', etc.). Cole (1955) is not an exception when he begins the treatment of each noun class with lists of «natural kinds» that are found in the class. Such a treatment results in an extremely high degree of overlapping groups. Comparing the classes 3/4, 5/6, and 7/8, we find that very few of his semantic groups are belonging to only one class (or one *pair* consisting of a singular and a plural class):[77]

The overlapping groups are shown in the table below (the numbers refer to the noun class labels):

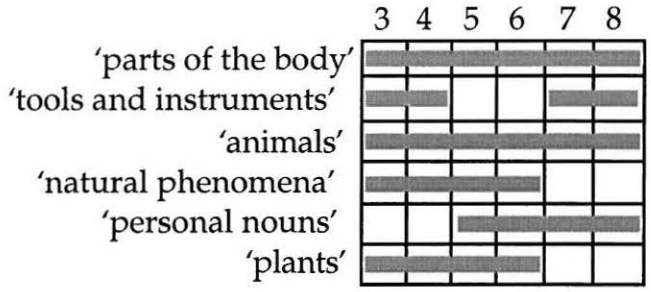

Table 13.

We are then left with 'a few terms applied to domestic animals' (class 3/4), 'trees' (class 3/4), 'some collective nouns' (class 5/6), and 'languages and characteristics' (class 7/8) as groups of entities that are uniquely bound to one pair of classes (singular and plural) only. In restricting oneself to dealing with semantic groups only on this level (as many bantuists at least implicitly have done), this situation

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[76] Leaving aside for a moment the discussion of whether each noun class can be described with *one* or *several* groups of notions

[77] In dealing with class 5, he includes the non count class 6 nouns, as he doesn't distinguish between the regular plurals in class 6 - plurals of class 5 nouns - and the non count nouns of class 6.

gives a good indication as to why it has been so difficult to come up with sensible suggestions for «class semantics».

The meanings in my tests have been formed on the assumption that the semantics of the classes only in part reflect such a «kind semantics». As generalisations over large number of single concepts have been taken to be the basic starting point for my analyses, there was no implicit restriction that these generalisations necessarily would lead to a resulting pattern of «kinds» only. However, *some* test meanings are compatible with the «kind» type of meaning; 'a *person*', 'a *tree* that grows in Europe', 'a *tool* that is used for making soap', etc.

Other test meanings, on the other hand, are not easily conceived as being based on «natural kinds», as they would simply be too few or too specific to form natural semantic groups: Is it possible to imagine a natural semantic system that makes use of «kinds» like 'balls' (where 'a small, round ball' would belong), 'lines' ('a long, thin line'), 'belongings of chiefs' or 'things used in religious ceremonies' ('a thing that a chief holds in his hand during a religious ceremony'), and even distinguishes between the «kinds» 'clothes made of skin material' ('a dress that is made of skin') and 'clothes that are worn out' ('a worn out dress')?

If the test results had shown significant answers *only* when meanings that can easily can be claimed to represent «kinds» were involved, that would have been an indication that I have chosen an unfortunate starting point; namely the assumption that the semantics of the classes to a large extent reflect more *abstract concepts*. However, this is clearly not the case: Several meanings that are less compatible with a «kinds understanding» were combined with the expected class prefix by a significant number of subjects (for example: 'a small, round ball' led a significant number of subjects to choose the class 5 prefix, and the class 3 prefix led a significant number of subjects to choose the meaning 'a dress that is made of skin', whereas the class 7 prefix led a significant number of subjects to choose the meaning 'a worn out dress'). Such meanings I would suggest, reflect abstract categories based on properties like 'round', 'material with «live» origin', 'affected by action', etc. that hardly can be perceived as «kinds». The significant results of several such meanings would then have to be rendered inexplicable if the semantics of the classes were to be explained only in terms of the traditional «kinds».

On the contrary, we find that the test findings are compatible with semantic patterns that reflect *both* «kinds» and more abstract properties.

Does any semantic category within each class exhibit a more central status than the others?

Assuming now that the semantics of each noun class has to be described in terms of several semantic categories, it is possible to conceive of two different situations concerning the status of each different category: Either there is no fundamental difference between the categories' positions within the classes, or some categories are more central.

Comparing the results from test 1 (with test meanings based on supposedly central categories/schemas) with the results from the tests 7 and 8 (based on less central categories/schemas), is the only way that the test results as such possibly can shed some light on this issue.

If the conceptual status of the different semantic groups were equal, one should not expect that systematically more answers to test 1 than to the tests 7 and 8 were significant.

In fact, we see that 8 of 10 (80%) answers to the test 1 items are significant (that is: a significant number of subjects have chosen the expected alternative), whereas 14 of 20 (70%) answers to the tests 7 an 8 are significant.

At least one can say that even with the reservation that it might be difficult to be conclusive about this issue (based on the *few* comparisons of items that this test makes possible), the test results are *compatible* with an assumption that some categories are more central than others. I even feel justified in suggesting that the results are *less compatible* with the opposite assumption; that *no* categories are more central than others. The material is, however, far too small to draw any strong conclusions.

Should the semantics of the noun classes be describes in terms of related or unrelated groups of concepts?

There is nothing in the test results that can be used as support for either of these suggestions. On the other hand, there is nothing that precludes any of them either. The hypothesis that my analysis is based upon - that the semantics of the noun classes can be described in terms of semantic *networks* (which of course presupposes *related* groups of concepts) - can, in other words, neither be confirmed nor disconfirmed by the findings of these tests.

This vagueness is, however, not due to the actual responses: Neither unambiguous results in favour of all the expected choices, nor the opposite result (none or very few expected results) could shed any light on the issue of interrelatedness.

Other types of tests would have to be used in attempting to reveal possible interrelatedness between concepts in a network. An example of a test type that possibly could be used is: 'triades' (where one presents the subjects with groups of three words, and the task is to remove the one that «does not belong to the group»).

Concluding remarks

My analysis in chapter 4 implies that I suggest that:

1) The classes are semantically definable.
2) The class semantics is based both on «kinds» and on more abstract concepts.
3) Each class can be defined in terms of several groups of concepts.
4) These groups of concepts do not have the same status within the class (some are more central than others).
5) The different groups of concepts within each class are related to one another in a «network structure».

Now we have seen that the test results seem to support some of these claims to a greater or lesser degree. Other results are for varying reasons useless. But no results are directly incompatible with any of the above claims.

In addition we can say that the test results are, if not always equally convincing, at least promising regarding the prospects of formulating new tests that might yield more and better information concerning noun class semantics.

In the type of test that test 1, 7 and 8 represent, each expected combination of prefix and meaning was tested four times, each with a different nonsense root (twice from form to meaning and twice from meaning to form). This was done to ensure that associations based on the root would not influence the results in one specific direction, and to have a sufficient number of responses concerning each combination to make it possible for consistent patterns to emerge, even with a rather high degree of random choices. But these tests still suffer from an obvious weakness; only *one* meaning was tested in each test. In some cases we have been left with a suspicion that a test meaning has been unfortunate (as 'soft-drink' in test 1), but with no possibility to compare such an item with other very similar ones (as others involving a liquid). It is clearly possible to form a test according to such a demand. The practical drawback is that the number of test items will explode. Nevertheless, I don't think there exists any shortcuts; testing of this type will necessarily have to be extensive. I believe that in the long run it will be more

fruitful to test small parts thoroughly. Choosing to test more concepts briefly will only result in vague and confusing results.

In sum, test 1, 5, 7 and 8 are all well suited for such more extensive testing. It would have been interesting to present the tests 2, 3 and 4 («prototypicality tests» presented in the appendix) for subjects who had not been presented with test 1 where the same expected first choices occur. That could have given an indication on whether or not I am right in suspecting that the test design itself has been partly responsible for the low rates of the expected choices. However, it is possible that other test types are better suited for the issue of prototypicality.

Test 6 («double profiling», also presented in the appendix) is too complicated; looking back, I believe it was premature to begin with such rather advanced tests before good procedures had been found for the simpler types.

In general, it could possibly be rewarding to try to construct more test meanings from the same «semantic fields», but formulated in a way that, according to hypothesis of class meanings, would place them in different classes (like *long* body parts contra *roundish* body parts, linguistic entities of *short* contra *long* duration etc.)

What I have achieved by performing the tests, is showing that even if the subjects themselves state that they do not have any intuitions about which answers to choose, it is rather clear that they have been influenced by unconscious associations between certain class prefixes and certain meanings, and that to a certain degree some results support my analyses, while none are incompatible with the analyses.

The most important problem that remains unsolved, however, is the lack of good suggestions as to how one could go about testing hypothesis about semantic *networks* and *relations between concepts*.

Chapter 6. Conclusion

The aim of this thesis has been to investigate whether or not it would be possible to establish a plausible semantic characterisation of some of the largest and most heterogeneous noun classes in Setswana. I think that my analyses of the classes 3, 5, 6, and 7 has shown that this is indeed possible.

It is actually surprising that so little extensive research has been done in this field earlier. I suspect that this, at least partly, is due to the explicit or implicit viewpoint that *categories* (linguistic as well as non-linguistic) have to be defined in terms of «sets of necessary and sufficient features» shared by all category members.

Accepting the possibility that categories might be structured in different ways has cleared the way for suggesting semantic characterisations of the noun classes in terms of *semantic networks*. Cognitive Grammar (as outlined for example in Langacker 1987 and 1991, Lakoff 1987) has provided me with «theoretical tools» that have proved useful. It has enabled me to account for numerous semantic connections between different subgroups of nouns within each class, as well as made it possible to extract abstract generalisations ('class schemas' or 'superschemas') that characterise the classes as such. We have seen that some classes can be characterised by *one* such generalisation, whereas others may be characterised by *two or more* such abstract generalisations (or 'superschemas') that don't need to be semantically interconnected.

That these most abstract generalisations within the semantic networks have turned out to be in accordance with «typologically natural systems» represents an indication that they really reflect a main characterisation of the semantics of these classes.

Much remains to be done concerning the psychological status of networks like the ones presented in this thesis, however. As a preliminary attempt, I conducted the psycholinguistic test described in chapter 5. Although not giving fully convincing evidence that *all* my proposed semantic subgroups within the classes represent cognitive units, the test results clearly show that the subjects in general have employed semantic associations in dealing with the test items (cf. the results of the significance test). Comparing the test results with the subjects' common statement (after performing the test) that they experienced *no intuitive feeling that any of the choices were better than others*, indicates that the semantic associations that the subjects undoubtedly have made use of, must be of a rather subconscious nature. It is possible though, that speakers differ with regard to

degree of conscious intuition about such associations. One mother tongue speaker on an occasion explicitly expressed to me the feeling that class 5 nouns refers to «deader» things than class 3 nouns do (a statement that is in accordance with my analyses of class 3 and class 5). In the theoretical framework of this thesis, that would indicate that, for him, the superschema (class schema) 'living' has cognitive salience.

The «naturalness» of the proposed superschemas together with the results of the psycholinguistic tests suggests that the answer to the question posed in the title of this thesis, is closer to *yes* than *no*. The question was: do the Setswana noun classes represent *conceptual categories marked by grammar*?

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APPENDICES

Appendix I. Noun lists

This appendix contains all the class 3, 5, 6, and 7 nouns from my noun sample. They are grouped according to the semantic categories that are elaborated in my analyses, but I have not provided explanatory remarks here. Hence, the reason for assigning a noun to a certain category might not always be obvious (particularly not to non-Setswana speakers).

Class 3

(1) Trees

mhapu (mofapu)	a species of hardy thorn trees
mhota	a species of evergreen tree; the raintree
mmasa	a tree with tanning bark
mmilô	a species of wild fruit tree; *Vangueria infauta*
moana	a baobab tree
modumêla	a species of acacia tree
modutu	a species of white-wood tree; *Celtis africana*
mofata (mhata)	a species of tree which grows in heavy sand; *lonchocarpus nelsii*
mofeie	fig
mogorogoro	green monkey orange
mokana	*Corchorus kirkii*, a species of tree
mokhibe	a species of tree
mokokwane	a species of tree
mokošo	a white thorn tree; (Acacia albida)
moku	*Acacia robusta*; a thorn tree with long, straight, small-hooked horns
montšantša	*Bauhinia petersiana*, a species of tree
mooka	a species of thorn tree; (Acacia karoo)
morolwane	a syringa tree
morukudu	tambuti tree; *Spirostachus africana*
moruthure	cat thorn; common hook thorn; water thorn; *Fabaceae*
morutlhatshana	a species of thorn tree that grows in dry regions; *Acacia caffra*
mosêtlha	a species of acacia tree; (Peltophorum africanum)
mosilapele	*Rhus lancea*; the karee tree
mosu	camel-thorn; Acacia giraffe

motšhaba a species of wild fig; sycamore fig

moupaphiri a species of karee tree; *Maerva angolensis,* or *Flacourtia-indica*

(2) Other plants

mhatolantswa a species of bush; *Bequaertidendron magalismontanum*

mmabi a species of wild cotton bush

mmidi mealies; maize

mmodula the flower on a corn stalk; the outer and loose husk that clings to corn

mofikapitse a species of creeping plant

mogabaditsana a species of plant that bears edible berries

mogamane Kalahary food berry; *Fabaceae*

mogarugaru a species of river grass

mogogo a bush with tender stems, edible black fruit and sweet to the taste

mogokang a hooked thorn bush that grows in sandy places

mogolabosigo datura; a *Stramonium* plant

mogwang a shoot, or blade just emerging above the ground; the blade of an ear of corn; the leaf of a reed

mojao poison leaf; *Dichapetalaceae*

mokapana same as *mokawa, Citrullus neudinianus* ; Herero cucumber; a species of creeper, edible, used medicinally as a purgative and as poison

mokgopa aloe

mokhure *Ricinus communis* ; plant bearing thorny pods, favourite food for goats

mokô marrow; kernel of fruit, or pip

mokome a present of berries, or bulbs

mokwalakwala spineless monkey orange

molodi the innermost bark of a thorn tree, used for making twine; a cord; fibre

monamô the rank, or runner of a creeping plant

monyêlênyêlê peeling plane (*Achiaaceae*); a crocus; *Ochna* sp.

moragangaka a species of herb, used for healing

morokolo small sour plum; *Olacaceae*

morotologa sour plum

mositlwane a thistle-like plant; a species of aspargus

mosukujane	*Lippisa jaranica* ; the leaves are infused and used as a drink for fevers; fever-tree; wild tea, used as a cure; wild mint
mothata	include species of *Cordia ovalis; Pappea capensis*
motlhabô	a shoot; a sprout in growing grain
motlhagala	species of mistletoe; infusion as tea
motlhonwane	species of bush, or *Maytenus tenuispina*
motlhuje	black root; blue bush; monkey plum; poison peach
motsotsojane	cross berry; *Grewia retinervis; Tilianceae*
motswalakgôrô	a bush bearing edible berries; *Waltheria indica*
mouta	mould
moyoani	live-long bush

(3) Long objects made of wood

mogoma	a plough; a hoe
mokasa	a block of wood; a thick stump of wood
mokgomilô	a hook
montêô	a staff for beating sandals; (buttermilk)
mopaêla	a switch; a stick for beating with
mophakalêgô	a cross-beam; a bar; a top cross-piece
morapa	a horizontal bar on two upright poles to hang blankets over
mosetshe	a peg
mosipuri	a beam; a cross-beam; a pole in a house for hanging karosses, etc.
mosogole	a wooden beam
motimêla	a charred piece of wood
motshe	a pestle; a stamping stick
motswaisô	a firebrand; a torch; a partially burnt stump; a piece of charred wood; a stick from yesterday's fire
motswi	an arrow

(4) Objects made of other plant material

mhikwana	branch in gate to show that people are out
mmitsa	charm that attracts customers; a charm that attracts men; (a prostitute)
morurêlô	a pot used for cooking medicines
moswang	the contents of an animal's stomach

motlaagana	a temporary house; a house made of bushes; a tent; a tabernacle
mutlwane	a snare; a trap with a beam

(5) Other long objects or phenomena (not wooden)

moeme	erect pointing, or erect thing; a name sometimes given to a *modimako*, or tall pole with black and white stripes, and crowned with civet cat tail that stands in the centre of the Bogwêra camp at the second initiation
mokgwabo	the tracks of a drove of cattle, or a crowd of people
mokôlô	a descending slope,, a steep bank,, a steep descent
mokwakwa	state of clay loam during dry season
moraladi	a stripe; a streak
moruti	a shade; a shadow
moseja	used mainly as an ADV.S., to mean on the other side; across, the land adjoining, or on the side of a river
mothaladi	a stripe in colours; a streak between clouds; a scrap of porridge left in a pot
mothalô	line
motlha	a time; a season; an era; date
motontonyane	thin long bucket
motsekedi	a sling
motshegare	daytime; ranging from late morning till late afternoon
motšhetšhedima	lane; traffic lane
motshisa	a stripe
mouwêlô	echo

(6) Long body parts

mmôpô	the bridge of the nose; the muzzle of an animal
moêlêdi	a navel cord
mokukuthô	a bone at the tail of the animal; coccyx
mokwatla	the back; the spine; a backbone
molêtsê	a leg
mongobutsa	a bone in an animal's leg above the shin
monô	a thumb
motwane	leg of a calf.

(7) Body-coverings made of skin

moitlamô	girdle; waistband; belt; sash
mothikga	ornamental skin clothes
motlokolo	goat-skin apron, for girls and women worn over their buttocks
motsetô	traditional leather strip worn by men through loins and buttock; napkin

(8) Other body-coverings

mofitshana	a plain iron ring worn on the wrist
moitshômêlô	armour; protective clothing
motlopô	a tortoise-shell; (clitoris)

(9) Other objects made of skin

mofalô	a small skin water-bag
mogogorwana	a dummy calf made of skin, stuffed with grass; a dummy calf that is licked by a lactating cow whose own calf has died
mokobolwane	calfskin
mophanyane	chapped skin
moropane	a timbrel; tambourin

(10) Skin related states (or sicknesses)

mmokwana	measels
mobipô	a weal; a swelling in which there is no fluid; or pus under the skin
mofufutsô	perspiration; sweat
mogote	Sg.: heat; fever. (Pl.: *megote* . refers to strong drinks)
mothopa	small boil
motshwa	an itchy eruption

(11) Lively human activities

mminô	dance
moduduetso	applause; ululating, of a woman in a dance; yodelling, of a girl, or woman
mogolokwane	ululation
mokgôbô	a reproach; abuse; reviling
moôpêlwane	the shouting, ululations and singing of a victorious army, choir, etc.

morapêlô	a prayer; a supplication; a prayer meeting
morupô	a circumcision
mošate	a seat of government; a capital city
moteka	a merry noise; a feast
motse	a village; a home; a homestead

(12) «Processes as things»

modiga	an end of a dispute, or discourse (*go diga* - to cast down; let fall)
moganô	a breaking up, or cessation of rain; time for resuming work after rain
mokgwasa	rustling; actual sound, as of something moving through twigs and foliage; (rumour)
mongatêgô	a fainting fit (*go ngatêgô* - to faint)
moônô	a snore; a grumbling; moan (*go ôna* - to moan; groan; snore)

(13) Objects connected to ground

mogobodi	a straight burrow
molala-thakadu	an antbear hole, or lair
motlhobodika	a large vent of an antheap
motlhodi	the eye of a fountain
motlôbô	a pit, or quarry; a place where clay for pottery, or *sebilô*, is dug; a storage place

Remaining nouns

The following nouns are not easily fit into the suggested semantic network of class 3:

mfama	half
mogadikêgô	a stomach ache
mogontlho	act of taking advantage of another
mokea	(used mainly as a REL. S., that which i crooked, or uneven)
mokgweleô	a burden; a heavy load
mokôkômalô	botulism
molafô	rabies
molaô	a law; a rule; a regulation

molebêla	used mainly as a ADV. OF T., to express early afternoon; excessive heat and glare of the sun; just after midday; when the sun gets into your eyes
mopalô	the state of being famished; malnutrition
mopêlêtô	spelling
mophetsosô	testis
moputsô	reward; prize
morafe	a tribe; a nation
moripô	a slope; the bottom of a hill; a dam constructed at the bottom of a hill
mosimana	used for anus
mosôkô	very thick unfermented porridge
Mosupologô	Monday
moto (mmoto)	the part below the anus
motshomilô	water running from the nose
motshotêlô	dry dung dust
motsô	used principally with numbers more than ten; a unit
motswatswa	used mainly as a REL. S., and as an ID:, a snow-white thing; spotless whiteness

Animals

mmoulô	a mule
moduôlô	a large, blackish hare
mokgêrwa	a lean, starved dog; a mongrel
mokwidinyane	Namaqua dove; *Oena capensis*
moditswe	a species of black lizard
mogofu	a big rhinoceros
mogokong	young locusts in the stage prior to flying, and when they have changed in colour from black to red
mogolêgwe	a species of small bird
mogotomoduane	a poisonous grub that covers itself in grass, fatal to animals that swallow it
mogwelegwele	a jay
mokabaoane	klipspringer
morubisi	an owl, believed to be used by witches at night
mosweleswele	a bird, found in thickets, that makes a noise like that of chopping

motlhakane a locust ready for eating
motoutwane a species of moth very destructive to clothing

Class 5

(1) Fruit

legapu water-melon
legelegele unripe fruit; (*lekgela* is more frequently used)
legomane a species of pumpkin
lekwele an edible tuber; a table potato
lemi the fibrous part of a pumpkin, melon, etc.
lerisô a species of large edible bulb
lerôtsê a melon; a melon that is not of the sweet species
lerula the fruit of the cider tree *Anacardiaceae*
letsêmê an immature corn, or sweet reed

(2) Other non-individuated, roundish objects («non-fruits»)

lebôte a bruise; blood blister in the flesh
legwarane a stone, tooth, etc., for rubbing skins
lehura a piece of fat
lekôkôma a side-burden on a pack-ox; the impedimenta of a travveler carried on his back; the rough points and swellings on smooth surfaces; impediments on what would otherwise be a fine, smooth blisterless piece of wood
lekwakwa a sharp-edged stone; a rough stone of volcanic formation
lelepa a difficult or intricate knot; a puzzle; a riddle; a mystery
lengope a lump of porridge when badly stirred
lenyaphiri limestone; a block of limestone with holes in it
lephoto a knot in a stick, or piece of timber; a place in a branch, or reed where a twig has been cut off
lerophi a blister; small boil; corn
lesope a ruin; a deserted house, or ruins of a kraal

(3) Other roundish (but individuated) objects

lefiswana little pot
lekuka a skin sack; a milk sack, made of skin (nowadays it may be made out of other materials). N.B. it is used for processing fresh milk into sour milk or *madila*

lesiba	the outer skin of a goat's bowel, and the musical instrument made from it
letsatsi	the sun; a day; heat caused by the sun
letshêgô	a trivet, or three-legged stand for a pot, etc.: a stone etc. for a pot, or kettle to stand on to be boiled

(4) Other non-individuated («but non-round») objects

lekala	department
leketlo	a chip of anything; a bit of anything broken off
lephata	department
lerapô	bone
lesapô	a bone
letlepu	mirth; plentitude of food, or any other material possessions; abundance, especially of food
letlhomaganyane	a small seam in a kaross
leudi	a speck; a shred, as of a blanket

(5) Paired, roundish parts of the body

lebotswana	the top of the shin bone
legofi	palm of hand; handful; applause
legope	the shoulder blade
legwele	ankle
lehinini	a gum; the place in a gum where a tooth is missing
lekgwafo	a lung
lelefu	a tonsil; an uvula
lelokololô	a joint of a finger, wrist or ankle
lepara	the upper inner part of a man's thigh, or that of a male animal; space between legs; not used of a female; a wide step
lerago	a buttock
lerêtê	testis; scrotum
lethêka	waist; loin
letlhafu	the muscle or lump of flesh in the calf of the leg, and in the arm between elbow and wrist
letlhapônô	retina
letswafo	a lung
letswele	a fist; a small compact group of people

(6) Single, roundish body parts

letlaparapelo pericardium

(7) Paired, «non-round» body parts

lefuka a pinion; a wing; a feather

lesufu a thighbone or upper leg bone of an animal or human being; the upper arm bone

letlhakore flank; side

(8) Paired, roundish body-adornments

lenyena an ear-ring

lesêka a bangle or bracelet; formerly a twisted metal ring worn on the arm and below the knee; a leg ornament; a coiled spring

(9) Roundish enclosures or locations

lebatla an open space; a public assembly; a gathering of people at the *kgotla*

ledutêla a pond or pool in the veld; a waterhole in the veld

lefatshe a country; a land; a state; the earth; the world

legae a home; a dwelling place

legotlhe universe

lehalahala hall

lekgelebe a bank or dam for holding a small quantity of water

lekoma a mud or brick wall

lelapa a low wall or enclosure in a home; a home; a family

lethudi a compartment under the eaves of a house; stoep under the eaves of a hut or house

letšha a pan, or shallow lake; a vlei, a saltpan

(10) Non-extended (in the domain of time), non-individuated, «linguistic items»

leaka (*maaka* is commonly used); a lie

lebitsô a name; a nomenclature

lediri a verb

leemedi pronoun

lentswe a voice; a word; the sound of a voice

lešalaô a load shouting

leselô noun

lesupi	demonstrative
letlhalosi	adverb
letlhaodi	adjective
letsibosi	interjection; an exclamation

(11) Non-individuated human beings

lebêlêtê	a wanton; a prostitute
lefêlêpa	a cheat; a rogue
lefetwa	one passed by; an old maid
lekau	a youth; a young man
lekgadi	an individual of the Manthatise clan
lekgarebê	a virgin; an unmarried lady or recently married young woman
lekgôba	a slave; a member of a slave family
Lekhalate	a coloured; a person of mixed blood in Southern Africa
lekorotlo	a round-shouldered person
lentaatshwene	a valiant man; one who has slain a man in battle; one who has killed a ravenous beast
lepempetlhwane	a small boy just big enough to herd kids of goat
lešafe	an albino
lesetedi	an individual of the Griqua race
lesokgola	a child just able to run about
leswebelega	a hired soldier; a mercenary
letagwa	a drunkard
letswalanôga	a deceiver; a scamp

(12) Negative states

lebêkêbêkê	starvation
lebogô	suffering; agony
lefaratlhatlha	confusion; a confused state of affairs; a state of confusion
lehuma	poverty; great sorrow; damage; loss
leitlhapêlô	riotous mirth
lenyôra	thirst
lepono	nakedness
leso	death
lesotlô	contempt; mockery

REST

leanetema	agenda
lebadi	scar
lebududu	dry, hard ground
lediana	a hindrance
legakgala	the very early dawn; the first streak of light; a caterpillar with shiny silvery dots along the body and which feeds on *mosu* or umbrella thorn and on *mogônônô*
legale	blade, or cutting edge of a knife, chisel, etc.
legare	a razor blade
lejêleputswa	gold reef
lekarapa	a mine recruit; helmet made of metal or some hard protective material
lekeišene	location
lekhurane	rash
lemaô	needle; injection
lengakare	the grapple plant
leotlana	a chief's officer; a town policeman
lerole	powder; dust
lesaba	a great secret meating
lesire	a veil for the face
lesomêpedi	dozen
leswagadi	a plant used in tanning
lesware	footsoreness, either in persons or animals; rash, particularly that which appears on a recently shaved skin
letetsa	mucus
letlabula	the time of the first ripe fruits; summer time; season preceding harvest time
letlalokwalo	parchment
letlatlana	dusk; eventide; early evening twilight; the gloaming
letlhatsô	vomiting
letlhôgôtshweu	a species of bush with white flowers; an old man
letlhwa	snow
letlotlobo	a snake skin; the scale of a fish; a piece of skin pulled off after a scald, etc.
letshogadi	jackboot
letshoroma	ague; malaria; rigor; shiver; fever; influenza

letsoku red ochre, used with fat as an unguent for the body
letsopa a clay for making pots, etc.

Animals

lebolobolo a puff adder
lehututu ground hornbill
lekaba a pack-ox
lekanyane a wild dog
lemphorwana a young bird; a nestling
leowang a crested crane, red and white in colour
lerane plover
lesaibôkô a very big goat; an angora goat
letlonkana a black wolf
letototo manded mongoose
letsutsuropu a species of bird
lewang a stork
legou a species of wild goose
leiô a crab; a crabfish
lengodu a female blue tick (likely)
lenong a vulture; a black vulture
lephusa a cow that has ceased to give milk
lesogo a partridge, included the red-winged one

Class 6

(1) liquids

madila thick milk; sour milk
makubêlô the last milk in a sack which only comes out after shaking
makgaritlha the dregs of beer, traditionally reserved for older men
maphoko froth on ground caused by rain water
maši milk

(2) Other physical masses

mabududu dry dust
makhafe fringes
marêrêmêla clots in a gravy; curds of sour milk, etc.
marorodi embroidery
matsankô wounds

matshêtshêthô bran from sifted meal; husks etc., from sifted grain

(3) Collective plurals

magoma a species of burr weed
magosi kings; kingdoms; chiefs; chieftains
makolane a thicket of palm trees
manku many sheep; flocks of sheep
marakangwaga ground plants with edible red fruits
maroana a thicket of mimosa trees of a certain species
mabi a thicket of a certain species of thistle

(4) Unspecified concrete objects

maadimô borrowed things; borrowing or a loan; borrowings or loans
mafalô scrapings
malao spices
manotô strays, as of locusts, cattle, etc.
mantsa loose hanging things
masomosomo many; crowds
mateng entrails of animals; contents; mysteries; deep things
matlhakola a remnant
matshwititshwiti large numbers
matswaketswake a jumble, or confused mess; a hodgepodge of food
maungobolekane canned fruit

(5) States

Temporary states

mahupuhupu state of being swollen and bruised from a beating; being bitten, as by bedbugs
makgwere a state of confusion in the mind; problems; difficulties
maleka equal; state in which two opponents, or opposing sides are evenly balanced
malôbôlôbô state of being drenched, or saturated
mangetengete state of being dented, or pierced all over
manyêrênyêrê state of being very wet, very muddy
matlhatlharara state of being untidy; being in a dishevelled and unkempt state

Qualities

maatla	strength; power
mafatswa	persuasiveness
magagarapa	shape of an animal's horns that point sidewards and then turn forward and in
maikaêlêlô	determination; intention, or aim; intentions; purpose(s)
makgakga	rudeness; impertinence
makgêmê	that which is watery; action of always flowing or running, as running eyes
manyama	auspiciousness; luck
maona	immaturity
maswatô	laziness
matletsetletse	great fullness; abundance, as provisions

(6) «Collective events»

madumê	greetings
maiphitlha-phitlhwane	evening recreation; hide and seek
mapêkêpêkê	flashes of light; sparks
magawegawe	disputes; uproars
matshedisô	condolences

REST

mabapi	concerned with
madisô	herding or grazing; pasturage
magamugamu	a watery swelling; a juicy morsel
magwata	roughness of a surface; blisters on a surface
mahube	the blush of dawn; the streaks of colour and light at dawn; (joint of meat)
maitsoketso	crooked ways
makalaba	large eyes
makgafa	a honeycomb
menangwane	details of a subject that is under discussion; ideas
manyediana	mumps
marinêpê	the border of a garden
maruru	winter clouds with cold, but no rain
matikiri	quarry

Class 7

Instruments

sealô	a skin, etc. spread out for lying on; a sleeping mat (*go ala* - spread out on the ground; make bedding ready for use)
seanô	a totem; an object of veneration (*go ana* - tell; relate; venerate; treat as sacred)
sebaga	a bead; a string of beads; a necklace
sebedisô	leaven; yeast
sebetapoane	a superior kind of necklace (*go beta* - choke)
sebetsa	a dangerous weapon; any instrument of punishment (*go betsa* - hit)
seboleledi	a mechanical device for recording speed (*go bolelela* - tell somebody)
seburuburu	a whirling toy; anything whirled to keep opponents away
sedibeletso	hand vessel placed to catch dripping liquid in (*go dibeletsa* - cause to be caught or trapped)
sedirisô	appliance (*go dirisa* - use)
sedulô	a seat (same as *setilô*)
sefawa	shrapnel; a missile
sefemô	a weapon of defence (*go fema* - avoid blows; ward off; parry)
sefikantswê	a cairn; a gravestone; a heap of stones piled up for some purpose. According to tradition, passersby entering a town usually contributed to the pile to ensure good luck
segafa	a bead
segajô	a stone engraving, or engraving on stone (*go gaba* - hollow out; scoop out; hew out; cut out, as an engraver)
segêlêlô	a vessel for drawing water (*go gêlêla* - draw water/fluid)
segopa	a dustpan; a scraper (*go gopa* - to remove by scraping; sweep up)
seikaêgô	a thing to lean against (*ikaêga* - rest upon or against; depend upon)

seiphemêlô that whith which one defends oneself
(*go iphemêla* - defend oneself)

sekampane a bow

sekanô a seal; a cement used by bees, etc.; a wax
(*go kana* - seal; cement; stop holes with cement)

sekei yoke-pin

sekgampane a kind of musical instrument

sekgêlê a banner; a flag; a kind of umbrella made of black ostrich feathers; the wool of a black sheep wound round a stick and planted as a goal; a goal; a prize

sekgopô a tool for gathering or collecting things
(*go kgopa* - trip up)

sekhobe a shoe made of home-made leather

sekhurumêlô lid, or a cover
(*go khurumêla* - close)

sekokolô a harrow for breaking clods of earth after ploughing

sekopisi photocopier

sekorôlô scroll

sekotsekara scotch cart

sekurufu a screw

selaga a snare; a trap

selefera silver; silver coins, or money

selêkanyi gauge
(*go lêkanya* - measure)

selêpê an axe

selogô a weaving machine; a handloom
(*go loga* - plait; weave)

seme a whip

senwêlô a drinking vessel; a cup
(*go nwa* - drink, *nwêla* - sink; drink for)

seolomankwane a small type of anthill

sepagamô a ladder; any mode of transport, such as bicycle, a car, etc.
(*go pagama* - climb; mount; ride)

sepalangwa vehicle
(*go palama* - to ride, *palangwa* - is being ridden)

sepapiedi a battering ram device for pushg or striking with great force

sephemêlô-sehubeng a defence for the breast; a breast plate

(*go femêla* - protect, *sehuba* - chest)

sephimolô a duster; a towel
(*go phimola* - wipe; wipe off, or out)

sephoti treshing machine
(*go phota* - tresh)

sepomô an implement for dividing something; scissors; shears; a pruning hook
(*go poma* - divide; cut off; snuff a candle; prune)

serala a receptacle for unthreshed corn made of poles; a pole platform on which garden watchers stand

serapô an oar

serua a bed chamber pot; a night pot

sesiramatlhô goggles
(*go sira* - cover, *matlhô* - eyes)

seteku a special winnowing basket

setêô a lash; a whip

sethato a charm

setilôbanka settee

setlhabamokgosi siren
(*go tlhaba mokgosi* - make a noice)

setlhaga a nest; a bird's nest

setlhatlhosi lift; escalator; cage for taking passengers or goods from one floor to another
(*go tlha tlhosa* - lift up)

setshamekisô toy
(*go tshameka* - play)

setsholetsi crowbar
(*go tsholetsa* - lift up)

setshwantsô a picture; an image; a parable; film; bioscope

setsidima a bell
(*go tsidima* - to tinkle, or ring, as a bell)

setswalô a door; a shutter
(*go tswala* - shut)

sibi a cake of dry dung

(2) Manners of acting, characteristics (including languages)

sebele	personality; reality; a person himself; bodily form (*mmele* - body)
segomo	behaving like cattle (*kgomo* - a cow, bull)
segosi	royal; pertaining to royalty (*kgosi* - a chief, king)
sejatlhapi	English (*go ja* : to eat, *tlhapi* : fish) (*Mojatlhapi* - an Englishman)
Sekololo	language of the Bakololo; in the custom, or tradition of the Bakololo (*Mokololo* - a «kololo-person»)
semolaô	legal; legally
senôka	sideways
serodumo	disloyalty; instability of affection
setlhanka	servile; pertaining to servitude

(3) Places associated with actions

sebaa	a small bare place on the ground (*go baya* - put down)
sebothêlô	a resting place for cattle (*go botha* - to repose; rest)
sebatla	an open valley, or a treeless place, or plain; an open space in the veld, or a level place, hence a spot that is suitable for holding unregulated meetings; a kind of Hyde Park Corner
seferô	a path between hedges
setsha	a plot; a plot of ground for building, or other purposes; estate

(4) Persons (agents) with extreme manners of acting

Positively acting persons

sebui	orator; speaker (*go bua* - to talk; speak)
seêmana	a mighty one, hence *monna wa seêmana* , a man of war. Also: mightiness
segwaba	a person who can accomplish or contrive to do difficult things
sejadi	planter (*go jala* -to sow)
sekgapho	a fast walker, or quick traveller
seopedi	a renown, or famous singer; an expert singer. Also: musical instrument (*go ôpêla* - to sing)

Negatively acting persons

seaka	a harlot; a prostitute
segagapi	an extortioner
seganana	naughty individual
segokga	a hefty fellow; a tough fellow
segwanti	a bully (*go gwanta* - to be wilful; conduct oneself in a defiant, or impudent manner; ...)
seitaodi	an unruly individual; a lawless individual; one who is not law-abiding (*go itaola* - to be lawless; be delinquent; govern oneself)
seitsamaisi	a superior, self-possessed, self-sufficient person; one noted for something; one who regulates his own movements
sephaphathegi	a very troublesome person or animal
sera	an enemy troop of soldiers; an enemy
serukutlhi	a rebel; a troublemaker (*go rukutlha* - to rebel; brawl; riot)
seswapelo	a sloven; a dead hearted one; desperado (*go swa* - to die, *pelo* - heart)
setlhodi	a spy

(5) Other negatively marked persons

searamô	an unfortunate fellow; a sufferer
selêma	a fool
semumu	a dumb person
serothola	a foolish, careless person; one not able to do anything properly
setêtê	a spoilt child
setlatla	a fool; a silly person
setsururu	a careless person; an untalented person

(6) Objects affected by action

seemera	an infirmity of long standing; an old weakness, or sore
sefolotsana	an aborted foetus of an animal; a weakling (*go folotsa* - to abort)
segogou	an old and worthless skin; (an old skinny person)
sefudu	a falling of the womb; a prolapsus of the walls of the vagina

	(*fuduga* - remove one's abode; depart; migrate to)
sejô	food; a type of food
	(*go ja* - to eat)
sekabetla	a piece of cardboard, etc.; a portion of food, etc
	(*go kabetla* - to cut off pieces)
seketana	a rag
sekgwene	a stump
sekwatla	dry and shrivelled up (of skins, berries, etc.), used mainly as a REL.S. (also: work-gang; roving work-gang; group of people)
selalêlô	an evening meal; a supper; the sacrament of the last supper;
	(*lalêla* - sup; take the evening meal)
serekolodi	a ransom; a thing given as a ransom
	(*go rekolola* - buy back; redeem; ransom)
serwala	food provided by the friends of a girl at her betrothal
	(*go rwala* - carry)
sesa	a stump (of a tree)
sesô	salt that has lost its flavour
sesupô	a sign; evidence; a testemony; testemonial
	(*go supa* - to point out/at)
sethunya	a flower; a blossom; a gun
	(*go thunya* - to explode; burst; blossom)

REST

sebêêlô	a pledge
seboka	congress; group of people gathered for a specific purpose
	(*go boka* - chase away)
sebopêlô	a woman's womb
sedikwadiki	circular in shape; measureless in extent; numberless
	(*go dika* - go around something)
seetlaetlana	a cherished one; a much-cared-for child
sefakô	hail
sefane	surname
sefara	the dividing of a river into two streams, or a road into two paths
sefoka	a strong aroma, either good or bad; a smell
	(*go foka* - blow, as the wind)
segakgamatsô	a wonder

segateledi nightmare

segofi [ARCH.] the palm of the hand

segopolô a thought
(*go gopola* - think; meditate; remember)

segwêtê an edible root shaped like a carot; beetroot

seidi giddiness

seimana nightmare

sekaka a desert; any impediment, or hindrance to progress; a waterless country
(*go kaka* - be drawn two ways; be engrossed in, hindered)

sekate trouble, or difficulty; a state of danger, or difficulty

sekgala a long distance, a long way off

sekgokgono an elbow

sekgwamolelô volcano
(*go kgwa molelô* - spit out fire)

sekhutlôntsi polygon

sekidi a patch; an island; a large piece of meat, etc.

sekwalô a title; a writing; a heading
(*go kwala* - write)

selaolê species of bush; *Lantana rugosa* ; brandy bush; violet (colour)

selete a deep hole in the ground; a deep pit

selôpô an elephant's trunk

semangmanyane a little bit of anything

senana area above pubis; mons pubis

senganga thick or sticky porridge; clay which sticks to the wheels; hooked thorns of *Acacia mellifera*
(*go nganga* - nag)

sengwatha a lion's share of something

sennannê such-and-such a thing, etc.

senono a stalk of sweet reed at the start of th ear, which when chewed serves to tie the bundle of reeds

senyane species of grass with white heads, used for making hats

seô a thing (contraction of *selô*)

sepitlaganyane DIM. of *sepitla* , a tight corner; a critical position

serethe butter

seretologa sour plum (same as *moretologa*)

seriri	hair that is overgrown; hair; a slaughtered animal at a marriage feast
serôpô	a small excrescence on the body; a small swelling on an animal's forehead caused by a cut made in order to distinguish ownership
seroa	*Pagodus* , a herbaceous perennial with small tuberous rootstock
serokolê	a bud
seroronya	deep mud
sešetlana	a storm; a hurricane; a strong rushing wind; cold weather
sesikalaba	a large live coal; a fire-brand
sesôlê	military (the army)
sethôbôlôkô	noon
setlaa	the jaw; the jaw bone (more common:*letlhaa*)
setlhokolane	small round wild beans of the blue gurri bush (also: *motlhakolane*)
setlogolo	a nephew; a niece; a man's sister's child; a woman's husband's sister's child; a grandchild
setlolô	an odd number; a number over and above a fixed one (*go tlola* - skip)
setlwasetlwane	a species of thistle that bears red berries
setoto	a corpse
setsala	an animal's womb (*go tsala* - beget; bring forth)
setshi	*Acacia hebecleda* ; a species of woody plant
setshwaêlô	an act of consecration or dedication; a hen, goat, sheep or cow given to a child in the hope that it will multiply (*go tshwaya* - brand an animal; mark in any way as a sign of ownership; mark a script and award marks)
setsubaba	a spot of any colour, but white on an animal
setulô	luck; chance

Animals

sekwakwalala	a cricket; the cicada beetle; screeching beetle
selealee	a tarantula spider
seokomana	a huge animal
serôlô-botlhoko	a bush buck

serunyi	a mole
setlhong	a hedgehog
sebokwana	small worm
segongwane	a young locust, just able to fly
segotshane	a species of falcon
sengalaga	cattle with big horns
sepirinka	an ass

Appendix II. Tests, part 1 and part 2

NONSENSE WORD TEST

Name:

Age:

Sex:

Occupation:

Examples with nonsense words:

motlwapo (metlwapo)	a person who is fond of children an alcoholic drink a kitchen utensil a long, black stick the round tail of a special kind of rabbit
a kitchen utensil	mothoketho (methoketho) sethoketho lethoketho mothoketho (bathoketho) mathoketho

CHOOSE ONLY ONE MEANING/NONSENSE WORD FOR EACH BOX !!

morutsa (barutsa)	a small, round ball a soft-drink a person a tool that is used for making soap a tree that grows in Europe
mothethi (methethi)	a tree that grows in Europe a very noisy and happy party a dress that is made of skin a box that is made of wood a shelter made of leaves and branches a long, thin line a bush that grows in Norway a hole in the ground
setsifo	a person a small, round ball a soft-drink a tree that grows in Europe a tool that is used for making soap
leatêpha	a person who is an expert in a special way of dancing a very small child a very stupid person a person from a foreign nation a person who is working in a car factory

lerutsa	a tree that grows in Europe a small, round ball a person a tool that is used for making soap a soft-drink
sekigo	the language of a European nation a worn-out dress a tool that is used for making soap a thing that a chief holds in his hand during a religious ceremony the nest that the snow-mouse builds
matsifo	a soft-drink a tree that grows in Europe a small, round ball a person a tool that is used for making soap
serutsa	a small, round ball a tree that grows in Europe a soft-drink a tool that is used for making soap a person

letitle	a big, round meeting-room a small, round ball the round part of an animal's back-leg a rude word a small, round fruit an ugly person the bad feeling you get after doing something wrong
moatêpha (baatêpha)	a very stupid person a person who is an expert in a special way of dancing a person who is working in a car factory a very small child a person from a foreign nation
marutsa	a soft-drink a person a tool that is used for making soap a tree that grows in Europe a small, round ball
mošumalêlo (mešumalêlo)	a dress that is made of skin a bush that grows in Norway a tree that grows in Europe a box that is made of wood a long, thin line a shelter made of leaves and branches a hole in the ground a very noisy and happy party

motarala(batarala)	a very small child a person who is an expert in a special way of dancing a very stupid person a person who is working in a car factory a person from a foreign nation
seatêpha	a person who is working in a car factory a very stupid person a person who is an expert in a special way of dancing a person from a foreign nation a very small child
motsifo (metsifo)	a soft-drink a small, round ball a person a tree that grows in Europe a tool that is used for making soap
sepotsime	the nest that the snow-mouse builds the language of a European nation a worn-out dress a thing that a chief holds in his hand during a religious ceremony a tool that is used for making soap
morutsa (merutsa)	a person a soft-drink a tree that grows in Europe a small, round ball a tool that is used for making soap

letophu	a small, round ball the bad feeling you get after doing something wrong a big, round meeting-room the round part of an animal's back-leg a rude word a small, round fruit an ugly person
motsifo (batsifo)	a tool that is used for making soap a person a small, round ball a soft-drink a tree that grows in Europe
letarala	a very stupid person a person from a foreign nation a very small child a person who is working in a car factory a person who is an expert in a special way of dancing
letsifo	a tree that grows in Europe a tool that is used for making soap a soft-drink a small, round ball a person

setarala	a person from a foreign nation a person who is working in a car factory a person who is an expert in a special way of dancing a very small child a very stupid person
a person	setlhorape motlhorape (metlhorape) motlhorape (batlhorape) matlhorape letlhorape
a small, round ball	lebôrêlêta sebôrêlêta mobôrêlêta (babôrêlêta) mabôrêlêta mobôrêlêta (mebôrêlêta)
a person from a foreign nation	mothephima (bathephima) lethephima sethephima
a person who is working in a car factory	lethephima mothephima (bathephima) sethephima

a tree that grows in Europe	letlhorape setlhorape motlhorape (batlhorape) matlhorape motlhorape (metlhorape)
a small, round ball that is made of wood	lephubi mophubi (mephubi) maphubi sephubi mophubi (baphubi)
a very small child	mothephima (bathephima) sethephima lethephima
a tree that looks like a ball	sephubi lephubi mophubi (baphubi) mophubi (mephubi) maphubi
a person who is an expert in a special way of dancing	letikga setikga motikga (batikga)

a small, round ball	matlhorape motlhorape (batlhorape) letlhorape setlhorape motlhorape (metlhorape)
a tree that grows in Europe	mabôrêlêta lebôrêlêta mobôrêlêta (mebôrêlêta) sebôrêlêta mobôrêlêta (babôrêlêta)
a very stupid person	sethephima lethephima mothephima (bathephima)
a small, round ball that is made of wood	lephogalaro maphogalaro mophogalaro (mephogalaro) sephogalaro mophogalaro (baphogalaro)
a liquid that comes from trees	lephogalaro maphogalaro mophogalaro (baphogalaro) sephogalaro mophogalaro (mephogalaro)

a person who is working in a car factory	setikga letikga motikga (batikga)
a tool that is used for making soap	motlhorape (batlhorape) letlhorape matlhorape motlhorape (metlhorape) setlhorape
a tool used for making a special liquid	sephubi lephubi mophubi (baphubi) maphubi mophubi (mephubi)
a very stupid person	motikga (batikga) setikga letikga
a soft-drink	setlhorape matlhorape letlhorape motlhorape (metlhorape) motlhorape (batlhorape)

a liquid that comes from trees	maphubi lephubi mophubi (baphubi) mophubi (mephubi) sephubi
a person	mobôrêlêta (mebôrêlêta) sebôrêlêta lebôrêlêta mobôrêlêta (babôrêlêta) mabôrôlêta
a tool used for making a special liquid	mophogalaro (mephogalaro) mophogalaro (baphogalaro) maphogalaro lephogalaro sephogalaro
a very small child	motikga (batikga) letikga setikga
a tool that is used for making soap	mabôrêlêta lebôrêlêta sebôrêlêta mobôrêlêta (babôrêlêta) mobôrêlêta (mebôrêlêta)

a soft-drink	mobôrêlêta (babôrêlêta) sebôrêlêta mabôrêlêta lebôrêlêta mobôrêlêta (mebôrêlêta)
a tree that looks like a ball	sephogalaro maphogalaro mophogalaro (mephogalaro) mophogalaro (baphogalaro) lephogalaro
a person from a foreign nation	letikga motikga (batikga) setikga
a person who is an expert in a special way of dancing	sethephima mothephima (bathephima) lethephima

TEST, PART 2 Name:

a person who is working with boats	maforobêta moforobêta (baforobêta) leforobêta seforobêta moforobêta (meforobêta)
the round part of an animal's back-leg	mofêô (bafêô) lefêô mafêô sefêô mofêô (mefêô)
a dress that is made of skin	sekgotepha mokgotepha (bakgotepha) lekgotepha mokgotepha (mekgotepha) makgotepha
a worn-out dress	mokugôthêbô (bakugôthêbô) lekugôthêbô mokugôthêbô (mekugôthêbô) makugôthêbô sekugôthêbô
the state of being a little bit tired	mokugôthêbô (mekugôthêbô) makugôthêbô lekugôthêbô mokugôthêbô (bakugôthêbô) sekugôthêbô

a thing that a chief holds in his hand during a religious ceremony	lefêô sefêô mafêô mofêô (bafêô) mofêô (mefêô)
a long, thin line	moforobêta (meforobêta) maforobêta seforobêta leforobêta moforobêta (baforobêta)
a worn-out dress	makgotepha lekgotepha mokgotepha (mekgotepha) mokgotepha (bakgotepha) sekgotepha
a person who is behaving well	sekugôthêbô mokugôthêbô (mekugôthêbô) lekugôthêbô mokugôthêbô (bakugôthêbô) makugôthêbô
a big, round meeting-room	makgotepha lekgotepha sekgotepha mokgotepha (bakgotepha) mokgotepha (mekgotepha)

the kind of things that are kept in a box	seforobêta maforobêta moforobêta (meforobêta) leforobêta moforobêta (baforobêta)
a person who is working with boats	mafêô mofêô (bafêô) sefêô mofêô (mefêô) lefêô
a long, thin line	sefêô mofêô (mefêô) lefêô mafêô mofêô (bafêô)
the state of being a little bit tired	mokgotepha (mekgotepha) sekgotepha makgotepha lekgotepha mokgotepha (bakgotepha)
a thing that a chief holds in his hand during a religious ceremony	moforobêta (meforobêta) seforobêta maforobêta moforobêta (baforobêta) leforobêta

a person who is behaving well	lekgotepha mokgotepha (mekgotepha) mokgotepha (bakgotepha) sekgotepha makgotepha
a dress that is made of skin	makugôthêbô mokugôthêbô (mekugôthêbô) sekugôthêbô lekugôthêbô mokugôthêbô (bakugôthêbô)
the round part of an animal's back-leg	leforobêta seforobêta maforobêta moforobêta (baforobêta) moforobêta (meforobêta)
the kind of things that are kept in a box	mofêô (mefêô) sefêô mafêô mofêô (bafêô) lefêô
a big, round meeting-room	lekugôthêbô mokugôthêbô (bakugôthêbô) makugôthêbô sekugôthêbô mokugôthêbô (mekugôthêbô)

setsêrô	a person who is working with boats the kind of things that are kept in a box the round part of an animal's back-leg a long, thin line a thing that a chief holds in his hand during a religious ceremony
makathe	a worn-out dress a big, round meeting-room a person who is behaving well the state of being a little bit tired a dress that is made of skin
mokesele (mekesele)	a dress that is made of skin a worn-out dress a person who is behaving well a big, round meeting-room the state of being a little bit tired
mokorite (mekorite)	a thing that a chief holds in his hand during a religious ceremony a person who is working with boats a long, thin line the kind of things that are kept in a box the round part of an animal's back-leg
letsêrô	a long, thin line the kind of things that are kept in a box a thing that a chief holds in his hand during a religious ceremony a person who is working with boats the round part of an animal's back-leg

lekorite	the kind of things that are kept in a box a thing that a chief holds in his hand during a religious ceremony a long, thin line the round part of an animal's back-leg a person who is working with boats
mokorite (bakorite)	a person who is working with boats the round part of an animal's back-leg the kind of things that are kept in a box a thing that a chief holds in his hand during a religious ceremony a long, thin line
sekathe	the state of being a little bit tired a big, round meeting-room a dress that is made of skin a worn-out dress a person who is behaving well
makesele	a person who is behaving well the state of being a little bit tired a worn-out dress a big, round meeting-room a dress that is made of skin
mokathe (bakathe)	a person who is behaving well a dress that is made of skin a worn-out dress the state of being a little bit tired a big, round meeting-room

matsêrô	the kind of things that are kept in a box a thing that a chief holds in his hand during a religious ceremony the round part of an animal's back-leg a long, thin line a person who is working with boats
lekesele	a big, round meeting-room a worn-out dress a dress that is made of skin a person who is behaving well the state of being a little bit tired
mokathe (mekathe)	the state of being a little bit tired a worn-out dress a dress that is made of skin a big, round meeting-room a person who is behaving well
makorite	the round part of an animal's back-leg the kind of things that are kept in a box a thing that a chief holds in his hand during a religious ceremony a person who is working with boats a long, thin line
mokesele (bakesele)	the state of being a little bit tired a dress that is made of skin a worn-out dress a person who is behaving well a big, round meeting-room

motsêrô (metsêrô)	a thing that a chief holds in his hand during a religious ceremony the kind of things that are kept in a box a person who is working with boats a long, thin line the round part of an animal's back-leg
sekesele	a dress that is made of skin a worn-out dress a person who is behaving well the state of being a little bit tired a big, round meeting-room
sekorite	a thing that a chief holds in his hand during a religious ceremony the round part of an animal's back-leg the kind of things that are kept in a box a long, thin line a person who is working with boats
motsêrô (batsêrô)	the round part of an animal's back-leg a person who is working with boats the kind of things that are kept in a box a long, thin line a thing that a chief holds in his hand during a religious ceremony

lekathe	a dress that is made of skin
	a big, round meeting-room
	a worn-out dress
	the state of being a little bit tired
	a person who is behaving well

Appendix III. Statistical Model and Method

Statistical Model and Method

by

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An individual is given k alternative answers to a certain question. We denote the probability of correct answer by p. If the individual has no preference but picks one of the possible answers at random, the probability of correct answer is $1/k$, otherwise we believe $p > 1/k$.

If several individuals (n) are asked the same question with the same k alternative answers, it is reasonable to conclude with $p > 1/k$ if sufficiently many (y) of them answer correct, i.e. if the test statistic

$$\left(\frac{y}{n} - \frac{1}{k}\right) \Big/ \sqrt{\frac{1}{n}\frac{1}{k}\left(1 - \frac{1}{k}\right)}$$

is large.

There is strong evidence for $p > 1/k$ if the probability of the observed value or even more extreme values of the test statistic is small when $p = 1/k$ (the so-called P-value or the significance probability).

We calculate the P-value for each question and conclude with $p > 1/k$ when the P-value is less than 0.01, having a probability of at most 0.01 for wrong conclusion for each question.

Appendix IV. Description and results of the tests 2 - 4 and 6

Test 2, 3 and 4

In these three tests my aim was to investigate the suggested prototypical structure of the classes 3, 5 and 7. For each class I presented a range of meanings, each compatible with one specific «low level schema» within the same class. The aim was to see whether or not the subjects would favour the prototypical meaning, and how the distribution of choices between all the other meanings would come out. For each class I had two test items each with different roots. In this test only the test type A would make sense.

Example:

mothethi	*(methethi)*	a dress that is made of skin
		a bush that grows in Norway
		a tree that grows in Europe
		a box that is made of wood
		a long, thin line
		a shelter made of leaves and branches
		a hole in the ground
		a very noisy and happy party

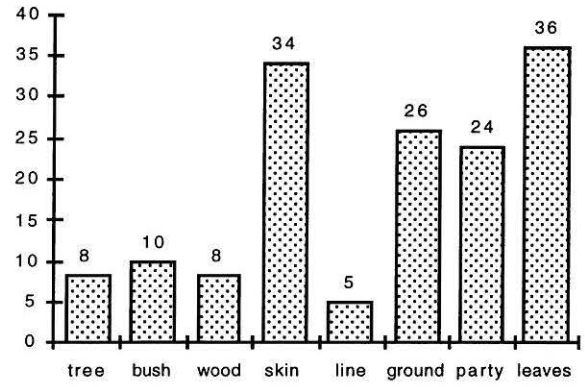
Results

The most surprising result is the systematically low scores of the meanings that are closest to what I have suggested as class prototypes, namely 'a tree that grows in Europe', 'a small, round ball' and 'a tool that is used for making soap'. I am particularly puzzled by the extremely low scores of 'tree', as trees seem to constitute an exceptionally clear case of a prototype (c.f. section 4.2). Characteristically, this was the only test item that made one of the subjects comment, after performing the tests, that she did not have any feelings about any of the items, *except that trees begin with mo-* .

Looking back, I can suggest two explanations: Firstly, there is a possibility that the subjects have avoided the meanings that occur frequently in the test (all these examples of «prototypical meanings» occur 14 times throughout the test, while the rest of the meanings in these «prototype tests» occur only twice). Selecting the same meaning again and again might intuitively seem «strange», as long as there are other reasonable alternatives. Accordingly, these tests should

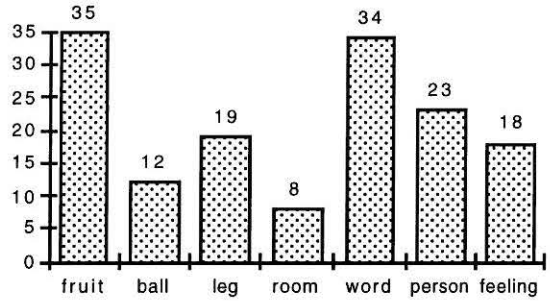
not have been mingled with the rest. Secondly, I do not believe that this test design is well suited for prototypicality testing.

Test 2 (concerning class 3) - results:



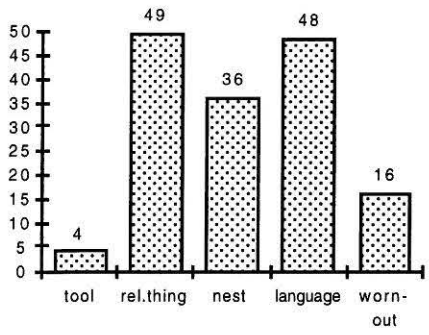
tree -> a tree that grows in Europe
party -> a very noisy and happy party
skin -> a dress that is made of skin
wood -> a box that is made of wood
leaves -> a shelter made of leaves and branches
line -> a long, thin line
bush -> a bush that grows in Norway
ground -> a hole in the ground

Test 3 (concerning class 5) - results:



room -> a big, round meeting-room
ball -> a small, round ball
leg -> the round part of an animal's back-leg
word -> a rude word
fruit -> a small, round fruit
person -> an ugly person
feeling -> the bad feeling you get after doing something wrong

Test 4 (concerning class 7) - results:



language -> the language of a European nation
worn-out -> a worn-out dress
tool -> a tool that is used for making soap
rel.thing -> a thing that a chief holds in his hand during a religious seremony
nest -> the nest that the snow-mouse build

5.5.4: Test 6

This test was intended to invite to a shift in focal attention; two elements that could easily be associated with different classes are included in each meaning. I wanted to find out: 1) if this would lead the subjects to prefer the forms that were compatible with one of the two classes that each element intended to be an example of, and 2) whether the distribution between those two forms would exhibit some systematicity.

The constructed meanings were:
'a small round ball [class 5] that is made of wood [class 3]',
'a tree [class 3] that looks like a ball [class 5]',
'a liquid [class 6] that comes from trees [class 3]', and
'a tool [class 7] used for making a special liquid [class 6]'.

Each meaning was tested twice with two different nonsense roots, and only with the test type A.

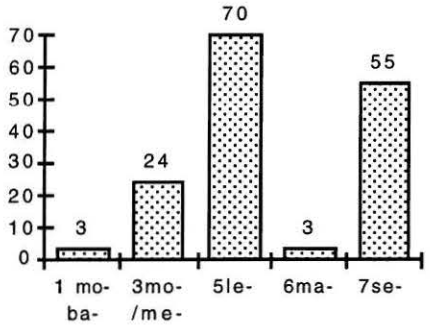
Example:

a liquid that comes from trees	*maphubi*	
	lephubi	
	mophubi	*(baphubi)*
	mophubi	*(mephubi)*
	maphubi	

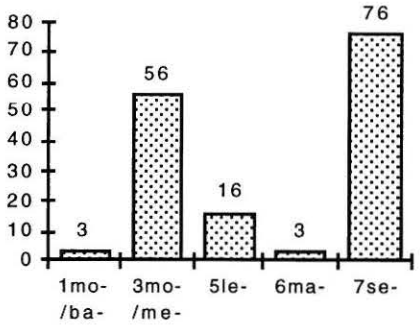
Results

It is difficult to be conclusive about these results, except that there seems to be a certain tendency towards favouring the first and probably most salient part of the meaning. The «modifying element» does not seem to influence the choices much.

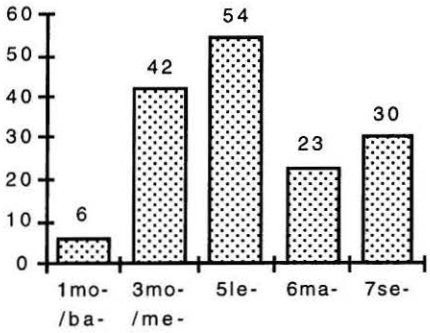
Class 5 + 3
(a small, round ball that is made of wood):



Class 3 + 5
(a tree that looks like a ball):



Class 6 + 3
(a liquid that comes from trees):



Class 7 + 6
(a tool used for making a special liquid):