5.1 **Aim and structure of Chapter (5)**

In this one but last Chapter, I will evaluate what has been said thus far about TCM and try to put together all the elements that have emerged from the comparison with other theories/models and practical tools into one modified model of TCM. The title of this Chapter is “Evaluation and Synthesis”. This needs some refinement. The evaluation will not be an evaluation of all the details of the theories/models and practical tools with which TCM was compared, nor of the comparison itself, i.e. similarities and differences between TCM and these theories/models and practical tools. All this has been discussed extensively in Chapter (4) and the summary to that Chapter. Nor will the synthesis be a synthesis of all the details discussed into a final version of TCM.

Instead, for evaluation, I will give an evaluation of the applicability of TCM as it was originally formulated by Alinei (1980a), as well as of my application of TCM to other disciplines. For synthesis, I will briefly outline my adjustments to the original (1980a) version of TCM as well as the most important details from the comparison with other theories/models and practical tools, and synthesise these into a modified model of TCM. I will then evaluate this modified model of TCM on three categories of specific aspects that may determine the usefulness of theories, viz. (1) requirements for a theory, (2) requirements for the structure of the lexicon, and (3) relevance to language.

As for the requirements for a theory, I will discuss such criteria as (1) explanatory power, (2) descriptive power, (3) simplicity, and (4) elegance. The requirements for the structure of the lexicon are those put forward by Aitchison (1987), Pustejovsky (1995), Evans and Green (2006), and Martin (2007). The relevance to language, finally, will be discussed in terms of (a) language acquisition, (b) language production, and (c) language understanding.

The structure of Chapter (5) will be:

- 5.1 Aim and structure of Chapter (5) .................................................. 381
- 5.2 Evaluation of applicability of (1980a) version of TCM .................. 382
  - 5.2.1 Status and nature of (axiomatic and semantic) features .... 383
  - 5.2.2 The status of Ls .......................................................... 384
  - 5.2.3 Handling of lexical categories ........................................... 384
  - 5.2.4 Internal organisation of the Lexical Cycle .......................... 385
  - 5.2.5 Process of generating the lexicon ..................................... 386
  - 5.2.6 Structure of the lexicon .................................................. 387
- 5.3 Evaluation of application of TCM to other disciplines ............... 388
5.2 Evaluation of applicability of (1980a) version of TCM

When applying TCM to the lexical area of <eating>, I came across a number of problems, partly due to the fact that Alinei’s (1980a) formulation was a first formulation with still a lot of unclarities in definitions, concepts, procedures, and organisation, as well as terminology used. In this effort, I was encouraged by the closing remark to Alinei (1980a):

“This paper is a preliminary attempt to work out the main lines of a Two-Cycle Grammar. Its main point is that there should be something like a Two-Cycle Grammar, even if it should prove to be quite different from the one I have tried to illustrate” (Alinei, 1980a:94).

It should be noted here that, in my application of TCM, I focused my attention on the Lexical Cycle and the lexicon, leaving out of consideration the Sentence Cycle and the relation between Lexical Cycle and Sentence Cycle. As a result, I will not give any judgement on the desirability of a Two-Cycle Model of Grammar.

Over the years, I have tried to resolve the unclarities that I came across when applying TCM, resulting in a rather detailed description of TCM given in Chapter (1). One of the problems was of a purely practical nature: the model resulted from a computer experiment on dictionaries carried out in the IBM laboratories in Bari (Italy), and therefore presupposed/required – also because of its internal organisation – the implementation of a rather sophisticated computer programme for it to be carried out fruitfully. At the time of application I could not avail of such a programme for reasons of copyright and confidentiality, and because its whereabouts were no longer clear. Instead, I had to apply TCM manually, and later I did not take any effort to “computerise” its application.

Most of the problems that I came across turned out to be practical problems and could be solved rather easily. A number problems, however, raised my special interest and had to do with more fundamental issues, such as (1) status and...
nature of (axiomatic and semantic) features, (2) the status of LSs, (3) the handling of the various lexical categories (verbs, nouns, adjectives, adverbs, pronouns, and prepositions), (4) the internal organisation of the Lexical Cycle, (5) the process of generating the lexicon, and (6) the structure of the lexicon. My proposed solutions are described in Chapter (2).

5.2.1 Status and nature of (axiomatic and semantic) features

Originally, all features were distinctive features, reminiscent of the Classical Theory of Categorisation. This was contradictory to the then emerging Theory of Natural Categorisation (Rosch, Lakoff, etc.). Axiomatic features were considered the conceptual heads and starters of taxonomies, in other words, taxonomies were thought to start at the top level. This, too, was not in line with Natural Categorisation with its claim that the basic level is the starter.

A plus was that axiomatic features were called axiomatic because the existence of primary features was denied, and lexical decomposition directly into primitives was rejected; instead stepwise lexical decomposition was adopted (Dik). Consequently, it did no longer matter whether the head feature of a taxonomy was the real head or just a head by axiom for the project or slice of the lexicon at hand. This is why Alinei called axiomatic features “unanalysed”, to indicate that they were considered to be starters by axiom, and that they were not the smallest possible features per se. However, even then the problem was what the head feature of a taxonomy should be: should it be <take¹> for TO EAT, for example, or <eat¹>?

This was important because axiomatic features were considered the starter features for the generation of lexical items.

An additional issue was if only axiomatic features should be allowed to be inserted into conceptual-syntactic categories. This was in contradiction with the principle of recycling of already generated lexical items as features. In other words, the framework appeared to be too rigid, despite its flexibility and dynamism that it already had.

This led me to reformulate the status of features in line with Natural Categorisation, i.e. bringing in prototypicality, for example, and changing its original scope as a model of structural semantics (see Alinei, 1980a:79, where he explicitly compares TCM with “other theories of structural semantics”) in the direction of Cognitive Linguistics. This had its effect not only on features, but also on other parts of TCM such as LSs, the internal organisation of the Lexical Cycle, and the structure of the lexicon. The principles of “Exchange of Function” and “recycling” played an important role in this respect as well, as will be shown in sections [5.2.4] to [5.2.6]. In fact, it was mainly the reformulation in terms of Natural Categorisation and the introduction of prototypicality that led to more subsequent adjustments to other parts of TCM, and brought Cognitive Linguistics closer, forming the basis for the choice of other theories/models and practical tools to
compare TCM with in order to achieve my ultimate goal of further developing the cognitive potential of TCM.

### 5.2.2 The status of LSs

The status of LSs formed another problem. In the original (1980a) formulation, they were attributed generative potential. This is contradictory to TCM’s own principles, because only ISs/IPs participate in the generation of lexical items since these structures transformations can apply/have applied, which is not the case with LSs. LSs do have structuring potential because they relate lexical items across category boundaries. Apparently, this structuring potential was mistaken for a generating potential.

In my adjustment of TCM, LSs are redefined as background frames that are fed by and as such are a-posteriori abstractions from ISs/IPs, yet they have generating potential not directly, but as background frames, which is in line with Cognitive Linguistics. A better description would perhaps be that LSs do not have direct generating potential, but indirect generating potential as background frames. By virtue of the principle of Exchange of Function, the same holds for LDs, and, as I argued in section (2.5), for the whole lexicon including Ts (see Fig. [42]). Despite this adjustment, the basic characteristic of LSs remained unchanged in terms of structuring the lexicon, viz. they relate lexical items across boundaries of Ts – which are collections of lexical items themselves – to form collections of lexical items, which, in their turn, can be united into larger collections of lexical items. LSs are intermediaries between Ts and LDs.

### 5.2.3 Handling of lexical categories

In principle, TCM claims to be able to handle all lexical categories – verbs, nouns, adjectives, adverbs, pronouns, prepositions, etc. alike – by one and the same system, viz. TCM’s syntax-inspired conceptual-syntactic framework as it operates in the generation process of lexical items in the Lexical Cycle. The examples of adverbs and pronouns described in section [5.2.5] show that the system sometimes has to be stretched a bit to keep up this claim. In addition, adjectives proved to be a difficult category, in particular because of the issue what the conceptual-semantic content should be of the “adjective-critical” conceptual-syntactic category IS (as, for example, in /SB. TR.N. <drinker>/< WH IS <...> for the lexical item THIRSTY). Therefore, I found it appropriate to weaken this claim somewhat and limit my own application of TCM to verbs, nouns, and adjectives so as to be able to evaluate the essence of TCM. The point of handling lexical items will be resumed under the process of generating the lexicon according to TCM in its original formulation in section [5.2.5]).
5.2.4 Internal organisation of the Lexical Cycle

In the original (1980a) formulation of TCM, the organisation of the Lexical Cycle was given in a rather sketchy way. There was not an overall picture. It was not clear, for example, what the role was of the various principles such as recycling and Exchange of Function, nor how precisely Ts, LSs and LDs interact. Likewise, the relation of the lexicon to the Lexical Cycle was not clear, nor the relation between the inventory of axiomatic features and the Lexical Cycle. My adjustments were the following.

As a result of the adoption of Natural Categorisation and trying to make TCM compliant with it, the whole organisation of the Lexical Cycle changed. In the first place, the inventory of axiomatic features that forms the input for the Lexical Cycle changed from an inventory of taxonomy starters to an inventory of starters at the basic level of taxonomies. Consequently, also the structure of taxonomies changed, i.e. the starting point is in my adjustments no longer the superordinate level as in the (1980a) formulation, but the basic level, in other words, somewhere in the middle instead of at the top. This had an obvious effect on the principles of recycling and Exchange of Functions. In the first place, the delimitation of both principles in the (1980a) version was not all that clear. In my adjustment, I captured both under the term “cyclicity”. There are two forms of cyclicity, i.e. (1) recycling, which refers to lexical items being recycled as conceptual-semantic features and being re-inserted into conceptual-syntactic categories for the generation of other lexical items, and (2) Exchange of Function, which refers to the situation where in taxonomies lexical items change their function of lexical item into that of conceptual-semantic feature at another level.

Were both recycling and Exchange of Function in the original formulation of TCM directed from top to bottom in a taxonomy, now they start from the basic level and can go not only downwards to the subordinate level as in the original version, but also upwards to the superordinate level. In this way, the generation of lexical items has become bi-directional (from the middle upwards as well as downwards) instead of uni-directional (from top to bottom only). This means that also the place of loose or potential features has changed: in the original formulation these figured at the bottom level of taxonomies only, in the adjusted formulation, they also function at the top of taxonomies. This, in its turn, will obviously have an effect on prediction and creation of new meaning developments: not only will new hyponyms be created, but also new hypernyms, and loose or potential features will not only predict developments at the bottom level, but also at the top level of taxonomies.

This cyclicity was, moreover, expanded to cover also the situation where by means of Exchange of Function whole ESs/EPs may be recycled as complex conceptual-semantic features as in the idiom KICK THE BUCKET (see section [2.5]), where the EP kick the bucket is generated, mapped onto the background frame associated with the lexical item DIE (i.e. the LS SB <human¹> PD <die¹>), and then
is inserted (recycled) as a complex conceptual-semantic feature in the generation of the idiom KICK THE BUCKET in the same LS. In addition, in the same way as LSs, the whole lexicon with all its parts (viz. Ts, LSs, and LDs) may serve as a background frame (cf. Fig. [42]).

Finally, since Alinei (1980a) was not explicit about the relation between the inventory of axiomatic features and the Lexical Cycle, and since he explicitly used distinctive features, this could only mean that in the relation between the inventory of axiomatic features and the Lexical Cycle (thus language), the Classical Theory of Categorisation applied and, consequently, that there was no room for experiential factors. Also this had to be brought in line with Natural categorisation, meaning that this relation should be a two-way relation, where category membership is determined by the way in which humans interact with the world (cf. section[2.5]).

As a direct consequence of the adoption of Natural Categorisation, the Lexical Cycle has become an even more dynamic entity than originally proposed by Alinei (1980a). In this, the principles of recycling and Exchange of Function play crucial roles. The original basic organisation in terms of Ts, LSs, and LDs, stayed intact.

5.2.5 Process of generating the lexicon

As mentioned in the previous section, recycling and Exchange of Function play crucial roles in the generation of the lexicon. Indicated by Alinei (1980a) in relation to taxonomies, and only superficially in the generation examples he gives, it was now made more explicit and expanded in Fig. (36) (section [2.2]) and Fig. (41) (section [2.5]).

Overall, the generation as sketched by Alinei, viz. Phrase Structure or Rewriting Rules → Deep Structure (via transformations) → Intermediate Structure (via transformations) → Surface Structure → Naming Rule, did not cause any serious problems, and could be applied as Alinei intended it. I suggested a reduction in the number of transformations, leaving Deletion and Movement only. Whereas Alinei (1980a) called the Naming Rule a transformation, I argued against this on the ground that it does not really transform syntactic structures into syntactic structures with a different order of elements and, if appropriate, some optional additional other alterations as the other, true, transformations do\(^*\). I suggest to reserve the term “transform” to what true transformations do. Since the Naming Rule exclusively “transforms” conceptual-syntactic structures into lexical items (or rather associates lexical items with these structures and, in addition, copies these structures in the representation of lexical items), I would rather label it provisorily “Lexicalisation Rule”.

\(^*\) For the endnotes, see p. 414 and further.
In some cases, however, the conceptual-syntactic framework was less convincing. Categories were introduced, for example, that did not really fit in the system, at least were not of the same status and nature as the other “regular” conceptual-syntactic categories (they could not be filled with conceptual-semantic material, for example), but were apparently necessary to make the system run smoothly, viz. such categories as PASSIVE added after PD in IP's for <ob.n.>s, 'S and OF in the case of IP's for deverbal lexical items like sip. Another problem, in this respect, is that in some cases, the conceptual-semantic content of conceptual-syntactic categories is not conceptual-semantic, i.e. not a lexical item recycled as a feature, but rather a purely syntactic feature, as is the case in the IP for the adverb HERE: /SB <…> PD <…>/ LOC <deix.+ego>, where “deix.” stands for deixis and <ego> represents the speaker. Another example is the conceptual-semantic content of the conceptual-syntactic category SB in the IP for the personal pronoun “I”: SB <ego>/WH PD <speak>. Cases such as the above two demonstrate that the syntactic orientation/inspiration of the system may sometimes lead to rather artificial solutions, and that the system is, therefore, perhaps too rigid to capture all the subtleties of meaning. At the same time, this makes TCM stand out among the other theories/models and practical tools with which I compared it: these are less, or not at all, syntactically inspired.

It was for this reason that I decided not to include lexical items other than verbs, nouns adjectives in my application of TCM to the lexical area of <eating>.

5.2.6 Structure of the lexicon

Alinei (1980a) described the structure of the lexicon in running text and one table. The running text contained algorithms and an explanation on the structure of the whole lexicon, including Ts, LSs, and LDs. The table (Alinei, 1980a:80) gives a rather static structure of the lexicon in the form of one LS only. In this way, the dynamic character of the TCM lexicon is not done justice, which is a pity, because it is very dynamic and can be represented very well in the form of a relational network, as I did in Fig. (43), (44), (62b), and (97). Moreover, the table does not show the central and binding role of LSs, which, again, is a pity. The structures that I presented in the figures mentioned show the full implications of Alinei’s original formulation and my adjustments to it, and make the resulting structure of the lexicon competitive vis-à-vis the other theories/models and practical tools that I compared TCM with. Although the structures that I presented vary, in all of them LSs are the binding elements, or, rather, the basis on which lexical items can be related to one another. These variations are variations in representation, the theoretical underpinnings are identical.
5.3 Evaluation of application of TCM to other disciplines

The basis for my application of TCM to other disciplines as described in Chapter (3), viz. terminology, translation and terminology, is the idea that a LS is a background frame, an abstraction from an actual conceptual-syntactic structure in terms of SB, PD, OB, etc. with conceptual-semantic content that is underlyingly associated with a lexical item. As such, a LS can be said to represent the meaning of a lexical item, or, in other words, to be a short way to analyse the meaning of a lexical item. By analogy, I applied this principle to actual sentences, where LSs are now abstractions not from individual lexical items, but from the whole structure of the sentence. For this, the notion of LS had to be adjusted in terms of LS-like Structure, i.e. a structure where the conceptual-syntactic categories SB, PD, OB etc. are now filled with elements from the actual sentence in running text or from conceptual-syntactic categories in definitions of terms.

The concept of LS-like structure proved useful as a discovery procedure for determining meaning, int. al., in the case of translation-oriented terminology, translation, as well as lexicography (i.e. studying neologisms, and measuring lexical information in dictionaries). Proper LSs proved to be useful for theory-oriented terminology (establishing associative relations between terms), and lexicography (compiling dictionaries). In these instances, there were no problems with the application of this part of TCM.

5.4 Synthesis: towards a modified model of TCM

The following elements have remained unchanged in respect of the original (1980a) formulation:

Unchanged:

1. The grammar is doubled into two twin cycles, the Lexical Cycle and the Sentence Cycle; the Lexical Cycle generates lexical items, the Sentence Cycle sentences
2. Lexical items are lexicalisations, or shortcuts, of underlying concepts that have a particular conceptual-syntactic structure with such conceptual-syntactic categories as SB, PD, OB, etc. which are filled with conceptual-semantic content in the form of semantic features. These conceptual-syntactic structures resemble the syntactic structures of actual sentences with syntactic categories like NP, VP, etc., and are, in other words, syntax-oriented/inspired”
3. TCM is “PD-centred”, and syntactically oriented/inspired”, i.e. it describes phenomena in relation to PD (as in Case Grammar).
4. The generation of lexical items proceeds along the following lines:
   a. Rewriting Rules or Phrase Structure Rules insert semantic features into the above conceptual-syntactic categories,
   b. forming Deep Structures (DSs).
c. To these DSs transformations may apply that via Intermediate Structures ultimately lead to Surface Structures (SSs).
d. The resulting SSs are called Internalised Sentences (ISs) or Internalised Phrases (IPs)
e. Via the Naming Rule these SSs are then lexicalised into lexical items represented in the form of Complex Symbols (CSs) with the orthographic form of the lexical item, its lexical category label (e.g. <sb.n.>), and the IS/IP underlying the lexical item.

5. The lexicon forms the output of the Lexical Cycle and consists of Lexical Domains, which consist of Lexical Systems (LSs), which, in their turn, consist of Taxonomies (Ts) that consist of lexical items

6. LSs have the form of structures with at least, and in any case, the conceptual-syntactic categories SB and PD filled with semantic features, LDs are entities consisting of one single or complex semantic feature. All those lexical items belong to a given LS to which one and the same such structure applies. All those LSs belong to a given LD that have at any place in their structure the semantic feature making up the LD. The lexical items that belong to a LS are grouped together into smaller collections of items in the form of taxonomies.

7. In Ts, lexical items at one level may – by means of the principle of Exchange of Function – be used as semantic features at the immediately lower level (from top to bottom), and form together with other features at this immediately lower level another lexical item. Exchange of Function is also possible from lower levels to higher levels (from bottom to top) where a lexical item at a lower level may change its function to that of semantic feature at the next higher level in a T. Exchange of Function is a regular phenomenon in Ts, and, from top to bottom, this line stops at the bottom of a T, where the final semantic feature is no longer used in a next lower level lexical item. Such a feature is called “loose” or “potential” feature and indicates the direction for further development of the T.

8. Higher-level lexical items in Ts are more general in meaning than lower-level ones. Lower-level lexical items may be semantically decomposed into more general higher-level semantic features

9. Lexical items that have already been generated may be recycled as semantic features and be re-inserted into conceptual-syntactic categories of IS/Is/Is, contributing to the generation of other lexical items.

10. Semantic features may be borrowed between Ts, or between LSs.

From my adjustments to the original formulation of TCM, and the outcome of the comparison of TCM with other theories/models and practical tools a modified model of TCM has emerged. The major modifications to the existing TCM model are the following:
Based on adjustments:

1. Semantic features are not distinctive features, but prototypical features. This also holds for axiomatic features.
2. Ts start at the basic level, somewhere in the middle.
3. There are two types of axiomatic feature: axiomatic features at the top of a T that have the function of axiomatic conceptual head feature, and axiomatic features at the basic level of a T that have the function of psychological of cognitive starter by axiom.
4. Exchange of Function works both from top to bottom and from bottom to top in Ts.
5. Semantic features both at the top and at the bottom of a T have the function of “loose” or “potential” features. This means that generation of new lexical items may proceed from the basic level upwards (generalisation) and from the basic level downwards (specialisation) in a T.
6. Axiomatic features at the top of a T are not semantic primitives, but starter “by axiom.”
7. LSs do not have direct generating power; they are a-posteriori abstractions of ISs/IPs, and serve as background frames; as such, they have indirect generating power, in that they “guide” or “direct” the generation of lexical items.
8. Also a T and LD, in fact, the whole structure of the lexicon, may serve as background frames in the sense of “guiding” or “directing” generation.
9. Exchange of Function may also apply to ESs/EPs: also whole ESs/EPs may by means of Exchange of Function be recycled as complex semantic features (e.g., in the case of EP “Kick the bucket” → semantic feature <kick the bucket> → lexical item (idiom) KICK THE BUCKET.
10. Experiential factors play a role between real world and language, i.e. the relation between the real world and the inventory of axiomatic basic level features (the psychological or cognitive starts by axiom) is a two-way relation: the perception/conception of the real world influences the generation of lexical items and the ultimate structuring of the lexicon (one’s categorisation of the real world), and the way in which one categorises the real world (the generation of lexical items and the ultimate structuring of the lexicon) influences one’s perception/conception of the very same real world.
11. The lexicon is a dynamic collection of lexical items with a structure that has the form of a relational network.

Resulting from the comparison with other theories/models and practical tools:

1. TCM’s lexicon has argument structure (in the form of conceptual-syntactic structures with conceptual-syntactic categories SB, PD, OB, etc.) and inheritance structure (in the form of relations between lexical items in terms of Ts, LSs, and LDs) (cf. Pustejovsky, 1995)
2. TCM’s lexicon does not need qualia structure, it has its own system as indicated in (12) above (unlike Pustejovsky, 1995).
3. TCM does not have event structure, except for one or two clumsy cases (e.g. the perfective aspect as in DRUNK – in DRUNK WATER – /OB/ WH PASSIVE PERF SB, indicating the perfective aspect) (unlike Pustejovsky, 1995).

4. TCM can deal with quasi-polysemy in an adequate way. Regular polysemy and quasi-polysemy are differentiated from one another in that in both cases the form of lexical items is identical but that in regular polysemy there is a difference in core canonical meaning, as against identity of core canonical meaning in the case of quasi-polysemy. TCM has an adequate system for this differentiation in terms of conceptual-syntactic categories SB and PD and their conceptual-semantic fillings as represented in ISs/IPs and/ or the LSs abstracted from these ISs/IPs, it does not need recourse to quasi-polysemy (cf. Pustejovsky, 1995).

5. Lexical items are regarded access points to encyclopaedic knowledge. There is no distinction between lexical meaning and encyclopaedic meaning (= knowledge), as in the lexical entry for BOOK (cf. Cognitive Semantics, Martin:1998, e.g.).

6. Meaning is dynamic since it may be extended (borrowing, recycling, Exchange of Function, “loose” or “potential” features), prototypical, and semantically flexible and procedural: meanings are triggered by context, i.e. the context of a lexical entry (e.g. BOOK) will trigger what aspect of the encyclopaedic knowledge present in a lexical entry will be accessed in ESs/EPs (cf. Geeraerts, 1993).

7. In TCM, i.e. in the Lexical Cycle, semantic roles (e.g. Agent) do not exist. These are taken over by/are identical with the conceptual-syntactic categories SB, etc. (unlike Case Grammar). Conceptual-syntactic categories as semantic roles resemble those in Frame Semantics and FEs in FrameNet; there is a difference in labelling, and in the fact that TCM uses one uniform system, as against a variety in Frame Semantics and FrameNet.

8. TCM can handle collocations, but does not seem to be able to distinguish between free combinations and collocations, as against Martin (2006).

9. The meaning of a lexical item is a combination of Componential Analysis, the relation between the lexical item with other lexical items, and its place in the lexicon (cf. Relational Semantics [Evens, 1988], and WordNet).

For a more detailed survey of differences and similarities between other theories/models and practical tools and TCM, see Chapter (4).

5.5 Evaluation of modified model of TCM

In this section, I will evaluate the modified model of TCM on three rather general criteria: (1) requirements for a theory, (2) requirements for the structure of the lexicon, and relevance to language.
5.5.1 Requirements for a theory

A theory is a sound theory if it scores well on the following aspects: (1) explanatory power, (2) descriptive power, (3) simplicity, and (4) elegance. The first two aspects were coined by Chomsky (1964:63) as explanatory adequacy and descriptive adequacy and originated from (Transformational) Generative Grammar. I will not use these terms, but explanatory power and descriptive power instead. I will use them in a rather loose way, more or less in the same vein as Pustejovsky (1991), i.e. does a theory cover as many data as possible of the set of data that it claims to be able to describe by the mechanism chosen (cf. Pustejovsky, 1991:410), and is the descriptive mechanism of a theory adequate enough to describe the data satisfactorily and make sufficient and satisfactory generalisations.

However, since I did not include in this PhD dissertation the Sentence Cycle and the relation between Lexical Cycle and Sentence Cycle, it would not be appropriate and relevant to express any thoughts about TCM as a whole in respect to these aspects. I will, therefore, limit myself to commenting on these aspects for the Lexical Cycle and the structure of the lexicon. This proviso also holds for all the aspects dealt with in section [5.5.3].

5.5.1.1 Explanatory power

TCM has made a deliberate and principled choice for its descriptive mechanism in terms of Ts, LSs, and LDs, along with its use of stepwise lexical decomposition (cf. Dik, 1978) and the conceptual-syntactic framework for the generation of lexical items, based on a computer experiment (Alinei, 1974a) as well as existing ideas that with each lexical item a concept is associated with a particular structure. Alinei applied it to Italian (1974a), English (1980a) and Dutch (1974b). Moreover, the mechanism is such that it can predict the direction of meaning developments (see sections [4.3.2.2.1], [4.6.2.2.1] and [5.5.2.]). On the basis of all this, one can say that TCM, i.e. the Lexical Cycle and the structure of the lexicon, has considerable explanatory power. The rules for the Lexical Cycle and the lexicon are such that they are capable of generalising regularities in the generation and structuring of meaning in a significant way. However, I deliberately use “considerable” here, because the system is still somewhat coarse for the description of adjectives, and needs some refinement here.

5.5.1.2 Descriptive power

Since in the modified model of TCM, in particular the Lexical Cycle and the structure of the lexicon, the very basics of the original (1981) formulation have stayed unchanged, the same comments hold for the modified model as for the original model (see section [5.2]). This means that also in the modified model, the generation of lexical categories other than verbs, nouns and adjectives (i.e. adverbs, pronouns, prepositions, etc.) are problematic and rather “artificial”. This weak-
ens the descriptive power of TCM. More research is needed here. The question is, however, if one and the same format for generating and structuring the lexicon is possible at all, and if this is desirable. It is fact that the practical tools FrameNet and WordNet limit themselves to verbs, nouns, adjectives (and sometimes adverbs as well). FrameNet has a uniform system of frames for all these lexical categories, but employs different FEs between categories. WordNet also includes adverbs, but uses different systems for the various lexical categories. I will not go into this any further.

5.5.1.3 Simplicity

When one considers the conceptual-syntactic framework of TCM for the generation of lexical items, their representations, and the resulting structure of the lexicon – in other words – the (conceptual-)syntactic orientation/"inspiredness" of TCM, one cannot but say – certainly in comparison with other models such as FrameNet, Martinian frames, and WordNet – that the model is less simple, regardless if it is the original model or the modified one. The (conceptual-)syntactic orientation/"inspiredness" of TCM often results in problems with determining the appropriate conceptual-semantic features and "squeezing" them in conceptual-syntactic categories. Also the labelling of conceptual-syntactic categories may sometimes be difficult just because of this, e.g. in the case of the object in phrasal verbs: what should be the conceptual-syntactic category for the object of e.g. LISTEN TO: OB or PREP. OB? Certainly, the latter would be rather questionable for a conceptual-syntactic category, it is more a pure syntactic category. The problem of labelling of conceptual-syntactic categories may be overcome, but the other problem is certainly a serious problem. The other theories/models and practical tools mentioned are simpler in this respect. On the one hand, in the other theories/models and practical tools, meaning descriptions in terms of frames (FrameNet and Martin) or synsets (WordNet) do not have a conceptual structure as elaborate as TCM, on the other, however, TCM may need more than one IS/IP/LS to for a lexical entry where e.g. Martin needs only one frame. Simplicity is a difficult criterion.

5.5.1.4 Elegance

If elegance is defined as simplicity, then TCM is less elegant than other theories/models and practical tools (see section [4.5.1.4]). If, however, elegance is defined in terms of informativity, then TCM, i.e. its Lexical Cycle and (structure of the) lexicon, is more elegant, because TCM indicates clearly the place of lexical items in the lexicon and their relations with other lexical items by means of Ts, LSs and LDs in their Complex Symbols and entries, i.e. their conceptual structure, as appears from Fig. (43), (44), (62b), and (97). Elegance expressed in terms of informativity comes close to explanatory adequacy.
5.5.2 Requirements for the structure of the lexicon

In the general introduction to this study, I outlined the requirements for the structure of the lexicon as put forward by Aitchison (1987) and Martin (2007). In the course of this study, also because of the comparison with other theories, a number of additional requirements emerged. I will discuss all of them in this section. Since there is some overlap between them, I will deal with them in one section.

Aitchison (1987)

Aitchison’s requirements for the structure of the mental lexicon are that it should be (1) flexible and vary in size, as well as in detail and specification of information, and (2) be infinite as regards the information stored, and (3) be regularly updated and up-to-date. All these requirements apply to TCM’s lexicon, except perhaps for the last one, but this is a practical matter: someone should do this. Aitchison’s requirements have some overlap with the requirements formulated by Pustejovsky (1995) and Martin (2007), for which see below. TCM’s lexicon is very flexible, and there is no limit on the information stored because of the possibility of new sense developments “directed” by Ts, LSs, LDs, “loose” or “potential” features, recycling, Exchange of Functions, and borrowing.

Pustejovsky (1995)

Pustejovsky (1995) proposes three requirements for the structure of the lexicon: (1) creative use of lexical items in new contexts (context-dependent meaning variation) should be possible without quasi-polysemy being introduced, (2) there should be permeability of senses, i.e. the lexicon should be such that also the finest meaning differences can be handled, and (3) the expression of multiple syntactic forms should be standard practice, i.e. multiple syntactic realisation patterns of a lexical item should not lead to quasi-polysemy.

The creative use of meaning is a strong point for TCM’s lexicon because of it can predict and generate new meanings “directed” by Ts, LSs, LDs, “loose” or “potential” features, recycling, Exchange of Functions, and borrowing (see under Aitchison).

The second requirement is met by the combination of recycling and borrowing: as Pustejovsky argued, the fine-grained distinctions in meaning will probably mean specifying further the direct object of the verb. In TCM terms this means that OB contains a lexical item that has been generated in another LS, but has been recycled as feature and is now borrowed in the LS under consideration. In this way, it brings with it all the specifications of the other LS. Together the specifications of both LSs may account for a fine-grained distinction such as between bake potatoes and bake a cake.

The third requirement is met in that all syntactic realisations of a verb like to forget are accounted for by a variation in OB in its underlying conceptual-syntactic
structure. Yet, all these instances belong to one and the same LS. This is possible because of the definition of LS: only SB and PD and their conceptual-semantic content matter for its determination. In this way, quasi-polysemy is not necessary.

Evans and Green (2006)

The requirement that Evans and Green postulated, i.e. that the lexicon should not only contain semantic information, but also encyclopaedic information, can certainly be met by TCM's lexicon as I demonstrated in the case of the lexical entry for BOOK (cf. Fig. [62] and [62a]).

Martin (2007)

As indicated in the general introduction to this PhD dissertation, Martin (2007) requires of the lexicon that there is (1) dynamism/dynamic extensibility, (2) relational organisation, and (3) preferential organisation. In Chapter (4) these have been supplemented by the criteria of simplicity and elegance that I discussed before (see section [5.5.1.]). Therefore, I will restrict myself to the first three.

The first requirement is similar to Pustejovsky's creative use criterion. The same arguments hold for TCM. TCM's lexicon does not have any problems with the requirement of relational organisation. It is relational all over. In section [2.7] I called this aspect "relatedness" (the presence of relations between lexical items) and "relatability" (the ability to establish relations between lexical items). The binding factors are the Ts, LSs, and LDs. The third criterion is met by my adjustment to TCM in terms of changing the status of features (and thus meanings) from distinctive into prototypical (some meanings/meaning elements are more prominent than others), and the adoption of Natural Categorisation.

5.5.3 Relevance to language

Last but not least, there is the general requirement of relevance to language. Any sound theory should be able to deal with (1) language acquisition, (2) language production, and (3) language understanding.

Language acquisition

The conceptual framework of TCM's Lexical Cycle, and in particular the Naming Rule point in the direction of language acquisition. Although Alinei (1980a) does not say much about acquisition in relation to TCM, except for a few lines in his closing remarks where he sums up a number of considerations for the motivation of the doubling of the grammar:

"Should we accept lexicon as <<given>>? The fact that words must be created before they can be learned, as well as the earliest stages of language development in chil-
dren, and the life-long process of learning new words, provide strong evidence to the contrary. ... A Lexical Cycle, syntactically based, is what we need as an explanatory model for the One-Word stage of children, for example” (Alinei, 1980a:94).

What Alinei probably means by the above statement is that children do not learn “ready-made” words, that is to say at the earliest stages of language acquisition – at later stages they certainly may learn ready-made lexical items –, but instead develop concepts that are lexicalised through naming and whose senses are then narrowed down.

Clearly, he had language acquisition in the back of his mind when developing TCM. This was even encouraged by a number of discussions that he had with Melissa Bowerman – an expert in psycholinguistics, in particular language acquisition – when he worked on TCM for one year at the Netherlands Institute for Advanced Studies in the Humanities and Social Sciences (NIAS) and because Bowerman read and commented on the (1980a) formulation of TCM (see the acknowledgements in Alinei, 1980a:33). In particular the Naming Rule (see Alinei, 1980b for a detailed discussion) and the whole generating mechanism of the Lexical Cycle lend themselves well to account for language acquisition. In fact, the term “Naming” is also used in psycholinguistics, in particular the study of language acquisition (e.g. Clark & Clark, 1977; Rice, 1980), though in a slightly different way. In TCM, Naming focuses on the relation between concepts and lexical items; in psycholinguistics, objects in the real world and lexical items are related to one another through Naming, Cf. Rice (1980):

“[The naming process] ... involves an intimate relationship between non-linguistic conceptual categories and linguistic bundles of information.

There are two components involved in the child’s ability to refer to objects, actions, attributes, experiences, and so on: the thing to be named and the name (“Rice, 1980:31).”

That the notion of Naming plays such a central role in TCM makes it plausible to think that the model can be used to account for language acquisition. Acquisition proceeds, furthermore, along the lines of Ts, LSs and LDs with the help of such principles as recycling, Exchange of Functions, and borrowing, and “loose” or “potential” features.

Language production

The same principles that play a role in language acquisition, may be used for language production, together with the existing structure of the TCM lexicon and Complex Symbols and lexical entries. The data given there may serve as guidelines for production.
Language understanding

Once generated, the TCM lexicon, and with it its relations between lexical items on the basis of Ts, LSs, and LDs, may be used as a model for language understanding. A case in point is the application of LSs and LDs to theory-oriented terminology and the compilation of dictionaries, but also the application of LS-like Structures to translation-oriented terminology, translation, as well as to studying neologisms in dictionaries, as outlined in Chapter (3).

5.5.4 Modified model of TCM and Cognitive Linguistics

As mentioned before, the number of transformations in TCM, even despite my reduction of it (cf. Thelen, 1980:267, where I suggested to reduce them to movement and deletion only), is still larger than in later developments in Generative Grammar. Chomsky (1995) reduces the number further to only one transformation, i.e. Move-α. This is a good reason for rethinking the syntactic part of TCM. As far as I can judge at this point, there are in principle two options for dealing with the generative part of TCM's Lexical Cycle with its rewriting rules and transformations: (1) try to bring it in line with the most recent developments in Generative Grammar and subsequently try to reconcile the result with cognitivist principles, or (2) try to remodel the generative part drastically in terms of Cognitive Linguistics. In both cases, the results would have to be (made) compatible with the formalism of TCM's Lexical Cycle (or rather, TCM's lexicon and lexical structure), and ultimately, the whole Sentence Cycle would have to be "tackled" and probably remodelled completely. Both options provide interesting challenges that need careful elaboration and further investigation. The first option would, obviously, be far too much to be carried out in the framework of this PhD study. It would involve two huge undertakings that have to be carried out both, one after the other: leaving it to the first step only would not make much sense because the result would still be theoretically incompatible with the cognitivist adjustments that I proposed for TCM, i.e. a prototypical categorisation in line with the Theory of Natural Categorisation (Langacker 1987:5 “[Cognitive Grammar] considers discrete categorization based on necessary and sufficient conditions to be cognitively unrealistic, and emphasizes instead a prototype or ‘central tendencies’ model …”). Moreover, the second step will probably be the most difficult and elaborate one and require a separate in-depth study. Therefore, I will restrict myself to the second option, which I consider more direct and promising, but even this option would be far beyond the limits of the present study. Nevertheless, I will make a first and modest attempt in what follows.

Despite the fact that in the modified model of TCM a number of important principles of Cognitive Linguistics have been included, bringing it more in line with Cognitive Linguistics, there still remain even more fundamental issues that stand in the way of possibly calling the model a “true” cognitivist approach to language. As was made clear in the general introduction, these are:
1. In TCM, syntax is central and autonomous, unlike in Cognitive Linguistics.
2. In TCM, all structures, whether conceptual-syntactic or syntactic, have to be generated computationally from primitive building blocks as in Generative Grammar. This is different in Cognitive Linguistics.
3. In TCM, structures are related to one another by means of transformations, unlike in Cognitive Linguistics.
4. TCM distinguishes two cycles, the Lexical Cycle and the Sentence Cycle. It interprets the relation between the two as “twinhood”, i.e. both have a similar set of rules and structures and the nature of these rules and structures is syntactic, analogous to the syntax of sentences, albeit that their scope varies between the two cycles. Cognitive Linguistics is different. However, on the one hand, TCM’s rigour and formalism in terms of the system of transformational-generative rules are in sharp contrast with the schemas of Cognitive Linguistics. On the other hand, it is not clear whether and how TCM’s rigour and formalism in terms of its system of Lexical Taxonomies, Lexical Systems and Lexical Domains – in other words, its system of lexical structure as a whole –, is compatible with Cognitive Linguistics.

I will elaborate on them below and then make a first and modest attempt at removing these barriers between TCM and Cognitive Linguistics.

5.6 Barriers between TCM and Cognitive Linguistics

5.6.1 Centrality of syntax vs. iconicity

It is a fact that the rules (i.e. the rewriting rules and transformations) and structures of the Lexical Cycle (e.g. the conceptual-syntactic structures in the form of Internalised Sentences and Phrases) as well as the division into Deep Structures and Surface Structures) are explicitly reminiscent of the formal generativist approach to language. TCM’s Lexical Cycle rewriting rules, transformations and conceptual-syntactic structures can be typified – in terms of Langacker’s words (1991:1) where he sums up the main features of generativist theories – as “… algorithmic characterization[s], with sufficient autonomy to be studied in essential isolation from broader cognitive concerns”. Another viewpoint that is also applicable to the syntactic system of TCM’s Lexical Cycle is that “… grammar (syntax in particular) is an independent aspect of linguistic structure distinct from both lexicon and semantics” (ibid.). Both aspects apply to TCM. The cognitive standpoints are radically different:

“… ‘cognitive grammar’ … assumes that language is neither self-contained nor describable without essential reference to cognitive processing … Grammatical structures do not constitute an autonomous formal system or level of representation: they are claimed instead to be inherently symbolic, providing for the structuring and conventional symbolization of conceptual content. Lexicon, morphology, and syntax
form a continuum of symbolic units, divided only arbitrarily into separate components; it is ultimately as pointless to analyze grammatical units without reference to their semantic value as to write a dictionary which omits the meanings of its lexical items” (Langacker, 1991:1).

All in all, in the Sentence Cycle, syntax is autonomous from semantics as far as rules (rewriting rules and transformations), (syntactic) structures (Deep vs. Intermediate vs. Surface Structures) and (syntactic) categories (NP, VP, etc.) are concerned. In the case of the Lexical Cycle, this is equally true of (conceptual-syntactic) structures (Deep vs. Intermediate vs. Surface Structures), rules (rewriting rules and transformations), and (conceptual-syntactic) categories (SB, PD, OB, etc.). This autonomy is a feature of formal, generativist models. Cognitive Linguistics is radically different as becomes clear form the following.

Iconicity

In Cognitive Linguistics, there is iconicity instead of this strict autonomy of syntax vis-à-vis other components of the grammar. Roughly, iconicity refers to the idea that the relation between a sign and its referent or denotatum is non-arbitrary, in contrast to what de Saussure believed. As Evans and Green (2006) put is:

“The way in which grammatical organisation mirrors experience is called iconicity” (Evans and Green, 2006:197).

Iconicity, in short, means that grammar is symbolic in nature:

“… a language needs at least three kinds of structures: semantic, phonological, and symbolic. The pivotal and most distinctive claim of CG [Cognitive Grammar (MT)] is that only these are needed. [bold by the author (MT)]. This is one aspect of its theoretical austerity. What makes it possible is the notion that lexicon, morphology, and syntax form a continuum fully reducible to assemblies of symbolic structures. If valid, this notion represents a fundamental conceptual unification” (Langacker, 2008:15).

Langacker (2008) defines these three types of structure as follows:

Semantic structures: “... are conceptualizations exploited for linguistic purposes, notably as the meanings of expressions” (Langacker, 2008:15)

Phonological structures: “... include not only sounds but also gestures and orthographic representations. Their essential feature is that of being overtly manifested ...” (ibid.)

Symbolic structures: “... are not distinct from semantic and phonological structures, but rather incorporate them” (ibid.).

Iconicity is present at various levels of grammar, i.e. phonology, morphology, and syntax. At the level of morphology, for example, “... the Roman numeral III is iconic in that it embodies a clear manifestation of the notion of ‘threeness’ in its
form, whereas the Arabic numeral 3 does not, and thus is arbitrary” (Cruse, 2006:16). At the level of syntax, iconicity can take two forms:

1. **Iconicity of distance (or closeness) in syntactic patterns:** “The distance between expressions corresponds to the conceptual distance between the ideas they represent” (van Langendonk, 2007:405);

2. **Word-order iconicity:** e.g. (1) found in the ordering of events in narrative sequences (“she married and got pregnant” vs. “she got pregnant and married”), (2) involving the concept of closeness to the speaker (“here and there”) (van Langendonk, 2007:407-413).

### 5.6.2 Generation of structures vs. inventory of ready-made structures

In terms of Generative Grammar, be it the earlier version on which TCM is based or a later one as in the Minimalist Program (1995), sentence structures emerge from “computational processes” (Chomsky, 1995:244) and these “computational processes are strictly derivational, guided by output conditions only” (ibid.), or as Evans and Green (2006) put it, these structures are:

“... ‘built’ by the application of grammatical structure building rules and transformational rules”, and emerging “... as the output of more fundamental primitives and processes ...” (Evans and Green, 2006: 754).

In the case of TCM’s syntactic system, this means rewriting rules, transformations, phrase markers (deep structures and surface structures). It also means that some constructions are more basic (deep structures) than others (surface structures). As TCM claims the grammar to consist of two twin cycles with a syntactic system similar in form but different in scope between the two cycles, this means that this generating mechanism goes for both cycles, although Alinei (1980a) is not very informative and explicit about how the system works in the Sentence Cycle.

Cognitive Linguistics takes a different view, represented in a number of different cognitivist theoretical models, e.g. Construction Grammar (CG – Kay and Fillmore, 1999), and Cognitive Grammar (CG – Langacker, e.g. 1987, 1991). Both theories

“... agree that the most explanatory model of language is one that assumes constructions [i.e. “ready-made’ grammatical constructions” (Evans and Green, 2006:660) (MT)]. In other words, both approaches favour a unified representation that links together syntactic, semantic, pragmatic (and phonological) information rather than representing these as properties of distinct components of the grammar ... This means that both approaches subscribe to the symbolic thesis as construed by cognitive linguistics” (Evans and Green, 2006:660).
Another common aspect of both theories is that

“... they take an inventory approach to the psychological representation of grammar. This type of approach assumes that the language system does not work predominantly by building structure, but by storing it in a complex network of interlinked constructions [bold by authors (MT)]” (Evans and Green, 2006:661).

This means that the grammar

“... is not conceived as a constructive device giving expressions as ‘output’, but simply as providing a speaker with an inventory of symbolic resources that he – the speaker – can employ for the construction of novel expressions, using all the information and abilities at his disposal” (Langacker, 1001:265).

The two theories differ in that Construction Grammar

“... rests upon broadly generative assumptions [bold by the authors (MT)] and therefore assumes Universal Grammar as a working hypothesis [and] ... sets out to develop a set of statements, albeit stated in terms of constructions, which underlie competence or knowledge of language in the Chomskyan sense” (ibid.).

Cognitive Grammar, on the contrary, is a “usage-based” theory:

“... usage-based models of language reject the Universal Grammar hypothesis, and argue instead that knowledge of language emerges from language use” (ibid.).

Putting it differently, generally, the focus in generativist approaches is on the generation of structures on the basis of a universal syntax-based grammar, in cognitivist approaches this is on grammar as a repository of ready-made constructions that the language user may turn to for creating new constructions, i.e. on the storing of structures on the basis of usage of language. On the basis of these characteristics, TCM may – in essence – be characterised as a generativist model rather than a cognitivist model, although – as indicated in this Chapter and as will be discussed in Chapter (4) – in its reformulated form it also has important features of a cognitivist approach.

### 5.6.3 Transformations vs. links

In TCM, structures (i.e. deep structures, intermediate structures, and surface structures) are related to one another by means of transformations. Transformations also play an important role in linking Internalised sentences and Phrases to one another. This relating or linking takes the form of computational derivation.

Cognitive Linguistics takes a different stance and uses transformational links, similarity links, and instance links instead. These link symbolic representations to one another in the form of cognitive (sub-)schemas or image schemas.

Lakoff (1987a) defines these links as follows:
“In the case of similarity links, the link is defined by shared subschemas. … the transformational link is not a matter of shared subschemas, but of related subschemas” (Lakoff, 1987a:426).

An instance link relates an abstract schema to a more concrete instantiation of it (cf. Lakoff, 1987a:424).

This means that structures are not derived computationally from one another, but related to one another by one of the above links. The following would be an example of a transformational link between two sentences (not represented as image schemas but in a conventional way):

“(a) A line of trees extends from the highway to the river”
“(b) A line of trees extends from the river to the highway” (Langacker, 2008:32).

Although these sentences depict the same “objective situation” or scene (Langacker, 2008), they represent different conceptualisations or perspectives, one from the highway to the river (a) and the other one from the river to the highway (b). The scene depicted in both sentences is the same, but “construed” differently (Langacker, 1987:138). It is this different construal (or these “alternate contruals” – ibid.) that makes the link transformational.

Image schemas are:

“… schematized patterns of activity abstracted from everyday bodily experience, especially pertaining to vision, space, motion, and force. Image schemas are seen as basic, “preconceptual” structures that give rise to more elaborate and more abstract conceptions …” (Langacker, 2008:32).

As an example of an image schema Langacker (2008) gives:

![Image schema of ENTER](image)

where “… the concept ENTER can be analyzed as a combination of the image schemas [or rather subschemas (MT)] object, source-path-goal, and container-content” (ibid.).
Obviously, for the Lexical Cycle and the lexicon in TCM to be in line with Cognitive Grammar, transformations have to be abandoned and replaced by constructions/schemas and relations between constructions/schemas, but this is not done easily and requires thorough research.

5.6.4 **TCM’s twinhood of cycles and TCM’s formalism vs. Cognitive Linguistics**

The twinhood of cycles requires some comments. In the first place, although Alinei claims a symmetry between the two cycles, this claim has not been supported by experimental psychological data; it is based on Alinei’s empirical (1974) computer analysis of all the lexical items in Italian in the field of “horse”. In other words, there is no psychological validity attached to it.

In the second place, as it is, the alleged symmetry or “twinhood” between the two cycles is “blurred”, as it were, by the syntactic element in the Lexical Cycle, even if the structures generated by it are called conceptual-syntactic structures in my terms (as generalisations of Alinei’s Internalised Sentences and Phrases). The fact is that in essence they are syntactic as in the Sentence Cycle from which they have been “copied”, and as in the Sentence Cycle they are manipulated by purely syntactic rules; even if the scope of the syntactic rules and structures is different (conceptual-syntactic vs. syntactic), their nature is identical. It would, therefore, at least be counterintuitive and psychologically doubtful that mental concepts and conceptual structure in general should be manipulated by a set of formal rules that are inherently purely syntactic in nature. The name “Two-Cycle Model” is, furthermore, not fully justified, because the “twinhood” between the two cycles has been described only rather loosely, and the Sentence Cycle has not been elaborated enough so as to actually demonstrate this “twinhood” in terms of both syntactic and semantic mechanisms.

It is evident that, in the light of the above, the twinhood between the two TCM cycles is incompatible with Cognitive Linguistics, in particular, Cognitive Grammar. If the treatment of syntax could be altered, and if the whole transformational system in TCM could be replaced by a system compliant with that of Cognitive Grammar, all in the light of iconicity, TCM might be brought even more in line with Cognitive Linguistics. However, even then it is by no means certain that TCM’s semantic formalism could be brought in line with Cognitive Linguistics. In the next section I will make a first and modest attempt.
5.6.5 Combining TCM’s formalism with a cognitively-based structure of the lexicon

5.6.5.1 Essentials of Cognitive Grammar

Schematicity and schematisation

The structures (i.e. semantic, phonological and symbolic structures) mentioned above are represented in schemas such as:

\[ \Sigma \]

\[ S \]

\[ P \]

\[ | \]

\[ \text{ indicates that there is a symbolic relation between the two poles connected by it.} \]

As can be seen, schemas can be simple ([a]), and complex ([b] and [c]).

The relation between S and P is such that “… either is able to evoke the other” *(ibid.)*. A unit of language (regardless of whether it is a sentence, a word, a morpheme, a sound) unites form (the phonological structure) and meaning (the semantic structure), where one cannot be interpreted without the other: form always evokes meaning, and meaning is always associated with form. This schematic representation may be put in a formulaic representation or construction as follows:

“[[MOON]/[moon]]” *(ibid.),*

where the slash is the equivalent of the “|” symbol in the schema above. This construction or expression, i.e. the morpheme *moon* (which is “… definable as an expression whose complexity is zero, i.e. it is not at all analyzable into smaller symbolic components” *(Langacker, 2008: 16)*), is to be interpreted as a representing a symbolic unit with the semantic structure (or meaning) MOON and the phonological structure (or form) moon. This example corresponds to the (a) schema above. Schemas (here represented in formulas) can be complex in varying degrees:

“[[[[MOON]/[moon]] – [[[LESS]/[less]]]] for moonless

[[[[MOON]/[moon]] – [[[LESS]/[less]]] – [[[NIGHT]/[night]]]] for moonless night” *(ibid.)*.
The hyphens in the latter two examples are used to indicate that here there are combinatory relationships (between moon and less, on the one hand, and between moon and less and night, on the other).

An important note should be made here about meaning. As Langacker (2008) puts it,

“... a meaning consists of both conceptual content and a particular way of constructing that content. The term construal which is preferable to imagery, used in earlier works ... [Langacker, 2008:43, f.n. 12 (MT)] refers to our manifest ability to conceive and portray the same situation in alternate ways [called “profiling”, ibid., f.n. 13 (MT)]” (Langacker, 2008:43).

In other words, meaning always involves both conceptual content and construal. In what follows, I will not include construal.

Schemas are the result of the process of schematisation, which is defined as:

“...the process of extracting the commonality inherent in multiple experiences to arrive at a conception representing a higher level of abstraction. Schematization plays a role in the acquisition of lexical units, if only because their conventional forms and meanings are less specific than the usage events [bold by the author (MT)] (i.e. the actual pronunciations and contextual understandings) on the basis of which they are learned” (Langacker, 2008:17).

Schematicity, i.e. the process involved in schematisation, is the converse of specificity (Langacker, 2008:55). The lexical item relative is schematic in relation to aunt, and this situation corresponds more or less to that of superordinate vs. basic level in terms of taxonomies.

The grammar in Cognitive Grammar consequently contains both schemas (abstractions) and instantiations (concretisations of these schemas). Instantiations are also called “specific instances” (Langacker, 1991:265) or “content units” (Langacker, 1991:113). As examples he gives:

Schema: $[[\text{COUNT N}] – \{\text{PL} \}/ [(\text{X}) – \{z\}]]$

Content unit[[[\text{DOG}] – \{\text{PL} \}/ [(\text{dog}) – \{z\}]] (Langacker, 1991:114)

where the schema categorises the content unit, and “group[s] it with other instantiations as manifestations of the same general pattern” (ibid.).

So-called “constituent trees” (Langacker, 1991:114). Such trees

“...represent the order in which simple structures combine to form progressively more complex composite structures” Langacker, 1991:214).

Constituent trees are the Cognitive Grammar equivalent of transformational derivations with the difference that in transformational derivations “… a set of fully-formed constituency (or phrase-structure) trees” are related to one an-
other”, whereas a constituent tree in Cognitive Grammar “… pertains instead to the composition of a single constituency tree” (Langacker, 1991:115).

As an example he gives:

![Constituent tree in Cognitive Grammar](image)

where the arrows indicate that what is at the tail of the arrow is dependent on what is at the head of the arrow, which is autonomous. The square brackets indicate that what is “embraced” constitutes schematic units, whereas what is in between parenthesis does not, but represents novel material. The underscores indicate that the items in question are “profile determinant[s]” (ibid.). For more details I refer to Langacker. Not only formulas ranging from simple formulas to complex ones like \([\text{MOON}]/[\text{moon}]\), \([\text{MOON}]/[\text{moon}] - [\text{LESS}]/[\text{less}]\] and \([\text{MOON}]/[\text{moon}] - [\text{LESS}]/[\text{less}]\) – \([\text{NIGHT}]/[\text{night}]\)] may constitute constituent trees, but also schemas as presented in Fig. (98) above (cf. Langacker, 2008:203). I will not go any further into this.

Note that the various levels in constituent trees are formulaic representations of schemas which, in their turn, are abstractions from sets of instantiations. From bottom to top, however, there is no progressive abstraction from lower levels upwards as in taxonomies. The leading thread form bottom to top is compositionality into more complex schemas/formulaic representations of schemas. This will be important for any attempt at combining TCM’s lexical structuring formalism with Cognitive Grammar.

Cognitive domain and complex matrix

Important notions in this respect are “(cognitive) domain” and “complex matrix”. A “(cognitive) domain” is “any kind of conception or realm of experience”. An expression is said to evoke a set of cognitive domains as the basis for its meaning (i.e. as the content to be construed). Collectively, this set of domains is called a matrix. For most expressions the matrix is complex in the sense of comprising multiple domains ([bold by the author (MT)])” (Langacker, 2008:44). Langacker (1991) gives the following example:
If I interpret Langacker correctly, all this (and perhaps even more) forms the conceptual content comprised in the meaning [KNIFE] that is – as a semantic structure – combined with the phonological structure [knaif] into the symbolic structure of the expression (or, in this case, lexical item) *knife*. Formulated differently, the complex matrix, i.e. the set of domains, represented in Fig. (101) forms the conceptual content evoked by the expression (the lexical item) *knife*.

Langacker (2008) distinguishes two types of domain: (1) basic domains, and (non-basic domains (in previous publications of his called “abstract” domains):

“A basic domain is … cognitively irreducible, neither derivable from nor analyzable into other conceptions. … Some prime examples are space [the experience of space (MT)], time, and the ranges of unanalyzed experiences associated with the various senses: color space (the range of colors we are capable of experiencing), pitch (the range of pitches we can perceive), temperature, taste and smell, and so on” (Langacker, 2008:44).

“Conceptions fall under [nonbasic domains] whether they are sensory or intellectual, static or dynamic, fixed or novel, simple or complex. Included as nonbasic domains are instances of immediate sensory, emotive, and motor/kinaesthetic experience (e.g. the sensation of wetness, of being afraid, or of blowing up a balloon), as well as the abstracted products of intellectual operations (e.g. concepts like JUSTICE, VERTEBRATE, and BATTING AVERAGE). Also included are conceptions manifested instantaneously at the level of conscious awareness (e.g. the image of a circle), as well as elaborate scenarios that we can only conceptualize stage by stage through processing time (like the successive steps in a complicated recipe). There is no requirement that a nonbasic domain be fixed, established, or conventionally recognized” (Langacker, 2008:45).

As for the terms Idealised Cognitive Model (ICM – Lakoff, 1987a) and frame (Fillmore, e.g. 1982), and other similar terms, Langacker (1987) says:
“An abstract [nonbasic (MT)] domain is essentially equivalent to what Lakoff (1982, 1987) and terms an ICM (for idealized cognitive model) and what others have variously called a frame, scene, schema, or even script (at least in some uses)” (Langacker, 1987:150, f.n.4).

This would imply that basic domains would not be frames or ICMs. In the case of the complex matrix for [KNIFE], this would, furthermore, mean – if I interpreted Langacker correctly – that domain 1 (SPACE) would be a basic domain, whereas domains 2 and 3 would also be nonbasic domains.

5.6.5.2 TCM’s formalism combined with Cognitive Grammar mental structures

In this section, I will only deal with conceptual content (leaving out construal or profiling) when elaborating further on TCM’s conceptual structures and their content as represented in Lexical Systems and Lexical Domains.

Representation

A closer look at Fig. (101) shows that domains (1) (SPACE) and (3) (SILVERWARE) correspond more or less to TCM’s “descriptive way” for describing lexical items by means of such Lexical Systems as SB <…> PD <have…> OB <properties/shape/…>, and domain (2) (CUTTING) to TCM’s “functional way” for describing lexical items by means of such Lexical Systems as SB <human> PD <cut> OB <…> INSTR <knife>. Domain (3) (SILVERWARE) would, furthermore, relate to the place in a taxonomy which the lexical item knife (whose conception is evoked as being part of this domain SILVERWARE) would be a part of, and in which the lexical item silverware would be at the superordinate level and knife at the basic level. In terms of TCM, the three domains taken together, i.e. the entire complex matrix, would be represented by the Lexical Domain <knife> that unites all the Lexical Systems in which <knife> plays a role.

At this point, it is necessary to have a closer look at symbolic structures and the nature of symbolisation. This is best visualised by using Langacker’s (1991) schematic representation of the symbolisation of the plural noun dogs:
where “s” = symbolisation, “c” = composition, and “I” = integration.

This figure is to be interpreted as follows.

“There are symbolic relationships between [DOG] and [dOg], between [PL] and [z], and between the composite structures [DOG – PL] and [dOg – z]. Syntagmatic relations, involving the integration of component structures, exist between [DOG] and [PL] at the semantic pole, and between [dOg] and [z] at the phonological pole. Relations of componentiality also exist between each composite structure and the components out of which it is assembled. … because both poles are involved, by any reasonable definition this grammatical construction [i.e. the lexical item dog pluralised into dogs (MT)] is therefore symbolic in nature …” (Langacker, 1991:106)

Formulated in terms of domains and complex matrices, this means that the semantic structure [DOG] evoked by the expression dog would comprise a complex matrix consisting of a number of domains (e.g. ANIMAL, BITING, BARKING, SPACE [relating to body form], etc.). I take it that, since in this case the expression is a single lexical item, the label of the complex matrix is [DOG] which corresponds on a one-to-one basis with the semantic structure [DOG]. This may, I presume, be different or require a different representation if the expression consists of more than just a single lexical item, as e.g. in the case of a clause or whole sentence. If this interpretation of Langacker is correct, this might open up possibilities for a combination of TCM’s lexical structuring system with Cognitive Grammar.

Support for equating a Cognitive Grammar (CG) domain with a LS is may be found in the definition of domain as given by Evans (2007):

“A domain constitutes a coherent knowledge structure possessing, in principle, any level of complexity or organisation. For instance, a domain can constitute a concept, a semantic frame or some other representational space of conceptual complex. Crucially, a domain provides a particular kind of coherent knowledge representation against which other conceptual units such as a concept are characterised” (Evans, 2007:61).
On the basis of all this, I suggest the following (on a very speculative basis):

- **CG matrix** = Lexical Domain in TCM
- **CG nonbasic domain** = Lexical System in TCM
  (comparable to ICM (Lakoff, 1987a), frame (Fillmore, 1982)

For the lexical item *dog* this would mean:

- **Lexical item dog** → **Conceptual content** = **LD [dog]**

**“Functional way”**
- LS: dog (SB) – bite (PD)
- LS: dog (SB) – produce (PD) - sound
- LS: human (SB) – breed (PD) - dog

**“Descriptive way”**
- LS: dog (SB) – has (PD) – (…) characteristic
- LS: dog (SB) – is (PD)

**Fig. (103): LD and LSs for the lexical item “dog” according to TCM**

If LSs and LDs can be combined in this way, also the option of Taxonomies is possible, further specifying the LSs and thus structuring the lexicon into a TCM kind of network structure of the lexicon.

Recall that symbolic structures in CG may be represented in the form of schemas or formulas. The formulaic representation of a TCM IP like OB <food> /WH PD <eat> PASS SB <human> would be:

```
[[[FOOD]/[fu:d]] – [[[EAT]/[i:t]]->[EN]/[i:n]]] – [[[BY]/[bai]] [[HUMAN]/[hju:man]]]
```

This semantic structure could, at the same time, be the representation of a TCM EP like “*the pie eaten by John*”. In other words, there would not be any difference in structure between the IP and the EP, in other words, between a conceptual-semantic structure in the lexical Cycle and a actual phrase in the Sentence Cycle. There would be just one structure. If this is correct and possible, this would be an important step in the direction of iconicity, and be another aspect that would bring TCM more in line with Cognitive Grammar.

LSs might, moreover, be represented as higher-order units in a constituent tree in the following way:
The LS HUMAN – EAT – FOOD could, tentatively, be represented in a formula as follows:

\[[\text{HUMAN}]/[\text{hju:m} \text{ə}] – [\text{EAT}]/[\text{i:t}] – [\text{FOOD}]/[\text{fu:d}]\]

Additional complements in TCM’s terms such as MANNER, SPEED, QUANTITY, etc. could be added in a similar way. This formula should also be representable in a schema in line with the schemas in Cognitive Grammar, but I leave this for the moment, as this would require further study.

**Links instead of transformations**

A very challenging but difficult aspect is transformations. Since TCM is more or less “built” around transformations and these thus are among the core features of TCM, simply removing them from the building without any replacement or support could possibly demolish the building. I will make a first and speculative attempt at “squeezing out” transformations.

LSs are abstract structures, since they symbolise as semantic structures in a formulaic way abstract schemas. The same holds for ISs and IPs. While in TCM the trend is to generate ISs and IPs computationally from fundamental and primitive building blocks and then abstract LSs and LDs from these structures in an a-posteriori way, in Cognitive Grammar these structures seem to be pre-existent to a large degree and form an inventory from which the language user may retrieve structures as required and appropriate.

Relations between ISs and IPs that were part and parcel in TCM in the generation from Deep Structures through Intermediate Structures to Surface Structures might be expressed in terms of links, viz. similarity links and transformational links. Instead of:
the picture would be:

**Deep Structure**: WH SB <human> PD <eat> OB <food>

\[
T \rightarrow \text{Deletion}
\]

**Int. Structure**: OB <food> WH PD <eat> PASS SB <human>

\[
T \rightarrow \text{Deletion}
\]

**SS**: SB <human> PD <eat>

**SS**: OB <food> WH PD <eat> PASS SB <human>

**LS**: SB <human> PD <eat> OB <food>

\[a\text{-posteriori abstraction}\]

**Fig. (105): The generation of ISs and IPs in TCM and their relation to a LS**

Clearly, in the CG case, there is no structure building. The relation between LS and ISs and IPs could then be indicated by means of instance links. This in itself would mean a change in perspective: from a-posteriori abstractions to pre-existing abstract structures.

Although this is rather rudimentary and speculative, the suggestions given in this section show that it might be possible to combine TCM’s formalism with CG’s symbolic structures. If this is possible, it would at least be a first step in the direction of a version of TCM without syntax-centrality and transformations, opening up the way for iconicity, which may then shed new light on the twin-hood between TCM’s cycles. In this way, TCM’s lexical structuring principles could, in my opinion, be a valuable contribution to the study of the lexicon. However, this would require additional in-depth research, which at this stage would be far beyond the scope of this PhD dissertation. However, only if the barriers described in this section can be removed, TCM may – if also the adjustments described in Chapters [2] and [4] are taken into account – rightfully be called a cognitivist approach.
5.7 Epilogue

TCM’s original (1980a) formulation may have been sketchy, unclear, questionable, imprecise, vague, and not developed well enough at points – since it was a beginning, as Alinei admitted – despite all this, it was and still is an interesting model right from the start. It had and has more in it than one would think on a first reading. I have discovered this over the past 30 years, studying and applying TCM. Although the model was conceived in 1979 on the basis of prior study (e.g. Alinei, 1974) and formulated in English in 1980, it is still relevant and has not lost any of its attractiveness. There are many elements that can be compared directly to contemporary theories/models and practical tools, and it is striking that TCM comes out quite well on a number of important aspects, the most important one being the concept of Lexical System (LS).

In this PhD study, I compared TCM (i.e. only the Lexical Cycle and the structure of the lexicon according to TCM – I left out of consideration all the other elements of TCM), with frames in Cognitive Linguistics, as well as in Case Grammar, Frame Semantics and FrameNet, and with the frame model put forward by Martin. I also compared TCM on these points with Pustejovsky’s Generative Lexicon, and WordNet. All these comparisons revealed strong and weak points of TCM, and together with my own studies on TCM over the years and my application of it to other disciplines, I synthesised these into a modified model of TCM. Then I checked this modified model against a number of criteria on the adequacy of theories, on the requirements for the structure of the lexicon, and the relevance to language. The modified model of TCM stood the test very well. And this is very promising for the future.

As this PhD study shows, TCM’s Lexical Cycle and the (structure of the) lexicon can without any problems be studied without involving the Sentence Cycle and the relation between the two cycles. For this, the latter two are not necessary. This may indicate that the relation between the two cycles as described in the original formulation is rather loose. The Sentence Cycle itself is another chapter. It has not been developed well enough, and, on top of this, it is based on an earlier version of a syntactic theory in the form of Transformational-Generative Grammar. The question is if an update of this syntactic theory would fit at all since it would obviously also have a serious impact on the Lexical Cycle. It would, moreover, by no means be certain if such an updated version of TGG could at all be used in conjunction with and in the Lexical Cycle of the modified model of TCM. In my opinion, it would be an uphill battle. Instead of concentrating on improving the syntactic part, it would therefore be better to focus on trying to combine the assets of the Lexical Cycle with the cognitive approach to language, as I have tried in this study.

My focus was on the structure of the lexicon, and in particular on the very useful notions of Lexical Taxonomy (T), Lexical System (LS), Lexical Domain (LD), recycling, Exchange of Function, borrowing, etc. I contrasted them with Cognitive
Linguistics and other relevant theories/models and found that they needed adjustment on a number of points in order to make them more compliant with cognitivist ideas. I hope that with this PhD dissertation I have made a small, but nevertheless valuable, contribution to the study of the structure of the lexicon. I realise that this is not enough. For a really useful contribution of the structuring mechanism of the Lexical Cycle to a true cognitivist description of the lexicon, it is necessary to rid TCM’s Lexical Cycle of its syntactic orientation without losing the cycle’s generative power in order to reconcile it with Cognitive Linguistics even further. This requires further and in-depth investigation and is a great and interesting challenge. I touched upon this difficult task only briefly and gave some first and rudimentary suggestions. Yet I hope that these will be useful signposts for future research.

Notes

1. I leave aside whether transformations are “structure changing” or “structure building” (cf. Wikipedia on “Transformational Grammar”) or whether they are syntactic or lexical, what seems to be indicative of their nature is that they operate on items of a similar kind, i.e. syntactic structures in this case.

2. Wikipedia: “In functional cognitive linguistics as well as in semiotics, iconicity is the conceived similarity or analogy between the form of a sign (linguistic or otherwise) and its meaning as opposed to arbitrariness”. Last visited: 6 May 2011.

   Nöth (1990:124):
   “Structuralist linguistics for a long time adhered to the Saussurean dogma of arbitrariness. Only recently has the importance of the opposed principle of iconicity become a topic of more intensive research”.

3. As an example van Langendonk refers to Haiman (1983) who gives the following sentences:
   “We can do it quickly and well” vs. “We can do it quickly and we can do it well”.

   Haiman (1983):
   “[In the second sentence] it is possible to do something well under one set of conditions and to do it quickly under another; but grouping quickly and well together, [as in the first sentence], implies that these are realized under the same set of circumstances” (Haiman, 1983:808).

   Another example by Haiman (1983): “red ribbons and white ribbons” vs. “red and white ribbons” (The colors red and white may occur on the same ribbon in the second sentence) (ibid.).

4. Langacker (2008) gives the following example:
   “For example, the basic sense of ring – roughly ‘circular piece of jewelry worn on the finger’ – is schematic relative to the conception of specific rings in specific contexts which vary in such details as size, material, identity of the wearer, and so. Schematicization can be
carried to different degrees, depending on the diversity of the elements it is based on. Since ring is also used for adornments worn in other places than on the finger, we can posit for it the more schematic value ‘circular adornment worn on the body’, with respect to which ‘circular piece of jewelry worn on the finger’ constitutes an elaboration or specific instantiation [bold by the author (MT)]. Still more abstractly, ring can mean ‘circular object’ (consider the rings in gymnastics) or even just ‘circular entity’ (e.g., the ring of dirt left around a bathtub)’ (Langacker, 2008:17). In this way, schematicity seems to equal generalisation in terms of TCM’s taxonomies.

5. The immediate question then would be what they should be then.