

POLYSEMY OF THE VERBS YA AND TLA IN NORTHERN SOTHO

BY

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**Assignment presented in partial fulfilment of the requirements for the degree of
Master of Arts at the University of Stellenbosch.**



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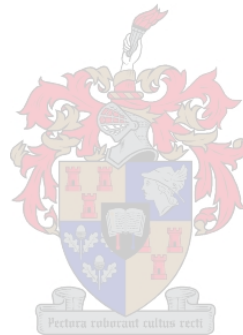
DECEMBER 2006

DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

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ABSTRACT

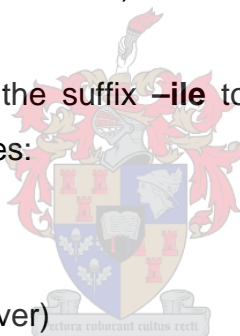
The topic of study is 'go' and 'come' verbs in Northern Sotho, which can be classified as verbs of state or motion. This study examines the semantics as well as the syntactic analysis of these verbs of state of motion within the framework of Pustejovsky's Generative Lexicon Theory.

This study will explore the polysemy of 'ya', as shown in the sentences below:

1. Bana ba ya nokeng.
(The children go/are going to the river)
2. Bašimane ba ya šokeng
(The boys go/are going to the bush.)

The verb **ya** 'go' may end with the suffix **-ile** to realise the past tense of **ya** as illustrated in the following examples:

3. Bana ba ile nokeng
(The children went to the river)
4. Bašemane ba ile šokeng.
(The boys went to the bush.)



The study also examines the polysemy of the verb **-tla** in Northern Sotho. The verb **tla** 'come' semantically denotes motion as shown in the sentences below.

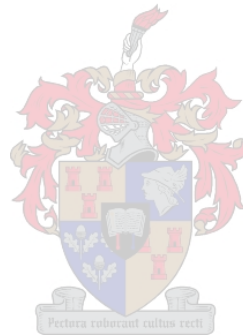
5. Basadi ba tla monyanyeng.
(The women come to the party.)
6. Banna ba tla kopanong
(Men come/are coming to the meeting.)

The verb **tla** may end with the suffix **-ile** to demonstrate the past tense of **-tla**, as shown in the following sentences.

7. Ngwana o tlile sekolong
(The child came to school)
8. Mokgalabje o tlile kgorong
(The old man came to the headkraal.)

This study will demonstrate that the agent argument of the verbs **-ya** and **-tla** may regularly occur as complement of the preposition **le** in Northern Sotho.

The range of data examined demonstrate that the verbs **-ya** and **-tla** exhibit a wide range of semantic selectional properties as regard the subject argument and the locative argument. The study also analyses the aspectual properties of the sentences with **-ya** and **-tla** with reference to the activity and achievement situation types.



OPSOMMING

Die onderwerp van die studie is die leksikaal-semantiese ondersoek van die werkwoorde **ya** ('gaan') en **tla** ('kom') in Noord-Sotho (Sepedi) as bewegingswerkwoorde. Die studie doen dus 'n ondersoek na die semantiek, asook die sintaktiese analise van hierdie bewegingswerkwoorde in Noord-Sotho binne die raamwerk van Pustejovsky se Generatiewe Leksikonteorie. Die studie ondersoek die polisemie van die werkwoorde **–ya** en **tla** soos geïllustreer in voorbeelde soos die volgende:

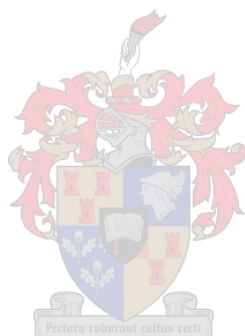
1. Bana ba ya nokeng.
(Die kinders gaan na die rivier)
2. Bašimane ba ya šokeng
(Die seuns gaan na die bos)
3. Bana ba ile nokeng
(Die kinders het na die rivier gegaan)
4. Bašemane ba ile šokeng.
(Die seuns het na die bos gegaan)
5. Basadi ba tla monyanyeng.
(Die vroue het na die partytjie gekom)
6. Banna ba tla kopanong
(Mans kom na die vergadering)

Die werkwoorde **ya** en **tla** kan die suffiks **–ile** neem om die verlede tyd aan te dui soos bo aangedui, asook in die volgende sinne.

7. Ngwana o tlile sekolong
(Die kinders het skool toe gekom)
8. Mokgalabje o tlile kgorong
(Die ou man het na die hoofkraal gekom)

Hierdie studie demonstreer dat die agent argument van die werkwoorde **ya** en **tla** reëlmatig kan verskyn as die komplement van die voorsetsel **le** in Noord-Sotho. Die

omvang van data demonstreer dat die werkwoorde **ya** en **tla** 'n wye verskeidenheid semantiese seleksiebeperkings vertoon rakende die subjek-argument en die lokatiewe argument. Hierdie studie analiseer ook die aspektuele eienskappe van die sinne met **ya** en **tla** met betrekking tot proses en toestand ('state') situasie-tipes.



ACKNOWLEDGEMENT

The completion of this thesis would have been impossible without the help support and guidance of a number of people.

I would like to thank my study leader, Professor Mariana Visser for her guidance, moral support and constructive criticism. Without her I wouldn't have completed my B.A Hons as far as my MA is concerned.

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I would also like to thank my friend Morongwa who always encouraged me to register and complete my thesis.

Lastly, I would like to extend my sincere gratitude to the course Co-ordinator who regularly posted study materials to me to complete my study.

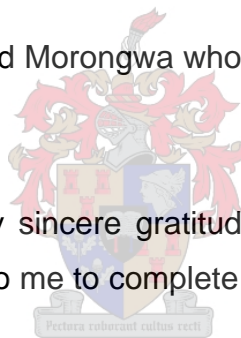


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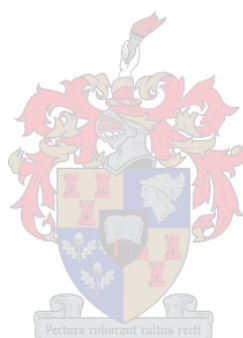
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CHAPTER ONE

1.1 PURPOSE OF STUDY

The purpose of this study is to investigate the polysemy of the verbs **-ya**(go) and **-tla** (come)in Sepedi (Northern sotho) This study will employ the framework of the generative theory of the lexicon postulated in Pustejovsky in examining semantic constructions associated with the **ya** and **tla** verbs. The study investigated the similarity in the verbs **ya** and **tla**. It also investigated how the verbs **ya** and **tla** are used in conjunction with the prepositions **le** (and) **ka**, (by) and (with) **le**

1.2 THEORETICAL FRAMEWORK

This study employs the theoretical framework of Pustejovsky (1996). According to Pustejovsky, lexical semantics studies how and what the words of a language denote and basically depends on the computational and theoretical state of the verb This theory of Pustejovsky explores the most pressing problems for lexical semantics which are:

- (a) Explaining the polymorphic nature of language.
- (b) Characterizing the semantically of natural language utterances
- (c) Capturing the creative use of words in novel contexts.
- (d) Developing a richer, co-computational semantic representation.

1.3 ORGANISATION OF STUDY

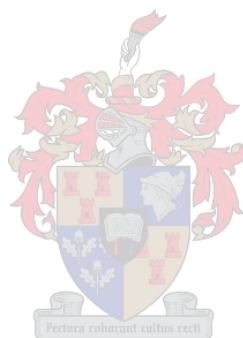
CHAPTER 1 outlines the purpose of this study, i.e the semantic study of the verbs **ya** and **tla** in Northern Sotho as verbs that denote motion.

CHAPTER 2 reviews the previous research on lexical semantics relating to. Problems of polysemy according to Pustejovsky (1996).

CHAPTER 3 examines the polysemy of the verb **YA** in Northern Sotho (Sepedi) when used inconjunction with the prepositions **KA** and **LE**

CHAPTER 4 examines the polysemy of the verb **TLA** in Northern Sotho (Sepedi) when used in sentences in conjunction with adjuncts with the prepositions **KA** and **LE**

CHAPTER 5 : Concludes the general findings on the polysemy analysis of the verbs **YA** and **TLA**



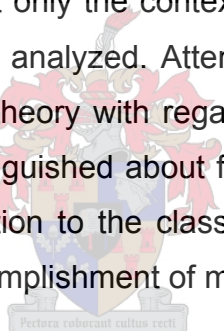
CHAPTER TWO

2.1 PROPERTIES OF GENERATIVE LEXICON THEORY

2.2.1 Introduction

The aim of this section is to analyse the properties of Pustejovsky's (1996) generative lexicon theory. This chapter deals mostly with verbs as analysed within generative lexicon focusing on Argument structure, Event structure, Qualia structure and Inherent structure.

According to Pustejovsky the meaning of words depend on the context in which they appear and are used. Wit verbs not only the contextual meaning is essential but even the selection peculiar to that verb is analyzed. Attention is also given to Pustejovsky's views about the generative lexicon theory with regard to lexical semantics and natural language knowledge where he distinguished about four processing problems for lexical semantics. We shall also pay attention to the classic diagnostic for testing whether a verb or verb phrase denotes an accomplishment of modification by temporal adverbial.



Attention is further given to the nominal alterations. Nouns have characteristic grammatical behaviour which shall be considered, depending on the semantic category that shall specifically be based on nominal semantics of count versus mass nouns.

- * Mass nouns: much sand, more water
- * Count nouns: Several houses, every child

Focus shall also be on the logistical problem of polysemy. I shall outline Pustejovsky's views on the ways in which words carry multiple meanings. This discussion will also refer to **complementary polysemy**.

According to Pustejovsky, Lexical semantics is the study of how and what the words of a language denote. The word meanings basically depend on the specific language. The

language semantics, in particular the semantics of words are based on meanings, both alone and in combination, the problem of compositionality.

Pustejovsky points out that compositional and theoretical linguistics previously treated the lexicon as a static set of word senses, tagged with feature for syntactic, morphological and semantic information. Different word senses are associated with distinct lexical items. According to Pustejovsky, formal theories of natural language semantics have done little to address two important issues:

- The creative use of words in novel context.
- An evaluation of lexical semantic models on the basis of compositionality.


Pustejovsky examines the interaction of word meanings and compositionality of the words. He argues that by adequately accounting for the problem of creative word senses, they directly address the problem of compositionality. Pustejovsky's theory of lexical meaning affects the general design of a semantic theory. According to Pustejovsky, the goal of a semantic theory is to recursively assign meanings to expressions, accounting for phenomena such as synonymy, antonymy, polysemy and metonymy. The compositionality depends on what the basic lexical categories of the language denote. Words behave either as active factors or argument. Pustejovsky reviews the lexical ambiguity in both theoretical and computational models. They incorporate "sense enumerative techniques" which distinguish word senses on the basis of finite feature distinctions.

Pustejovsky states that contrastive and complementary ambiguity in the former is basic homonymy, where a lexical item accidentally carries several distinct and unrelated meanings, whereas the latter refers to logically related word senses of the same lexical item. Pustejovsky discusses the careful representation work done by verb classes; i.e. the semantic weight in both lexical and compositional terms which usually falls on the verb. He refers to the set of word senses when an individual lexical item is combined with phrases and clauses as a Generative Lexicon, and the operations which generate

these “extended senses” as generative devices, including operations such as type coercion and co-composition.

Pustejovsky examines the goals of linguistic theory, in general, and lexical semantics. He argues that the framework of knowledge for lexical items must be guided by a concern for semanticity in addition to grammaticality. Pustejovsky states that the model of semantic interpretation constructed should reflect the particular properties and difficulties of natural language. He argues that natural languages fall within the weakly polymorphic languages, more expressive than monomorphic, but below unrestricted polymorphic languages. Pustejovsky states that the characterisation is richer to capture the behaviour of logical polysemy as well as effects of co-compositionality.

Pustejovsky identifies the levels of representation of the generative theory of the lexicon as follows:

- 
- (i) Argument structure (for the representation of adicity information for functional elements)
 - (ii) Event structure (for the representation of information related to Aktionsarten and event type and related work).
 - (iii) Qualia structure (for the representation of the defining attributes of an object such as its constituent's parts, purpose and function, mode of creation etc.)
 - (iv) Inheritance structure (for the representation of the relation between the lexical item and others in the lexicon).

Pustejovsky examines the role of coercion in the grammar and the need for other generative devices such as selective binding and co-composition. According to Pustejovsky there is no single form of polymorphism, rather polysemy and type ambiguity are result of semantic phenomena in specific interaction.

Pustejovsky postulates that nouns are characterizable in terms of three dimensions of analysis:

- (i) Argument structure.

- (ii) Event structure and
- (iii) Qualia structure.

The semantic type system and the distinction between unified types and dot objects present an analysis of nominal polysemy.

Pustejovsky outlines the area of grammar that can be simplified by applying the principles of generative lexical analysis through the use of generative devices and the type system. He discusses argument selections driven by semantic types, modulated by constraints on coercion rules, selective binding and co-composition operation in grammar. This approach permits the explanation of the polymorphic nature of verbs taking multiple syntactic types.

Pustejovsky argues on methodological grounds for a strong distinction between common-sense knowledge and lexical structure. The type of creative polysemy exhibits a regularity and systematically differs from patterns of pragmatic sense extension or modes of metaphor.

2.2 THE NATURE OF LEXICAL KNOWLEDGE



According to Pustejovsky most linguistic frameworks of both computational and theoretical linguistics are concerned with structural information of a sentence encoded from a lexicalised perspective.

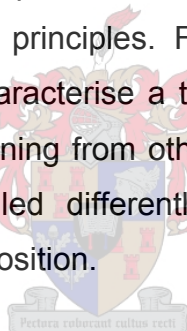
Pustejovsky argues that most pressing problems for lexical semantics are as follows:

- (a) Explaining the polymorphic nature of language.
- (b) Characterising the semanticity of natural language utterance;
- (c) Capturing the creative use of words in novel context;
- (d) Developing a richer co-compositional semantic representation.

According to Pustejovsky linguistic studies can be informed by computational tools for lexicology as well as the computational complexity of large lexical databases.

Pustejovsky observes that computational research profits from the grammatical and syntactic distinctions of lexical items, and the NLP (National Language Processing) system. Pustejovsky states that NLP must account for the differences in lexicons and grammars. He suggests two assumptions that will figure prominently in lexical semantics framework. Firstly, without an appreciation of the semantic structure of a language; the study of lexical semantics is bound to fail. Meaning cannot be completely divorced from the structure that carries it. It is an important methodological point, since grammatical distinctions are useful metric in evaluating competing semantic theories.

The second point is according to the meaning of words should somehow reflect the deeper conceptual structures in the cognitive system and the domain it operated in. The semantics of natural languages should be the image of non-linguistic conceptual organising principles. Pustejovsky points out that computational lexical semantics should be guided by the following principles. First a clear notion of semantic well formedness will be necessary to characterise a theory of word meaning. It may entail abstracting the notion of lexical meaning from other semantic influence. Discourse and pragmatic factors should be handled differently or separately from the semantic contributions of lexical items in composition.



Secondly, Pustejovsky states, lexical semantics must look for representations that are richer than thematic role description. The distinctions possible with thematic roles are much too course-grained to provide a useful semantic interpretation of a sentence. Pustejovsky argues that a principled method of lexical decomposition presupposes.

- (i) a richer, recursive theory of semantic composition.
- (ii) The notion of semantic well-formedness and
- (iii) An appeal to several levels of interpretation in semantics.

Thirdly, related to the preceding point, Pustejovsky argues that lexical semantics must study all semantic categories in order to characterise the semantics of natural language, hence Northern Sotho. The lexicon must encode information for categories other than verbs.

Pustejovsky thinks that the position of lexical research should be within the larger semantic picture, based on controlling the inferences associated with the interpretation process.

Pustejovsky's opinion is that the representation of the context of an utterance should be viewed as involving many different generative factors that account for the way that language users create and manipulate the context under constraints, in order to be understood. According to Pustejovsky within such a theory where many separate semantic levels (e.g. lexical semantics, compositional semantics, discourse structure, temporal structure) have independent interpretations, the global meaning of a "discourse" is a highly flexible structure that has single interpretation.

2.3 SEMANTIC CLASSES AND CATEGORICAL ALTERNATION.

Pustejovsky states that, within the tradition of formal semantics, the fundamental aspect, of a word's meaning is perhaps its semantic type. He states that the categorical or type information determines not only how a word behaves syntactically, but also what the elements of the category refers to. The verbs **love** and **hate**, for example, are viewed as relation between individuals, and the noun **woman** picks out the set of all individuals who are women.

2.3.1 Verbal Alternations

According to Pustejovsky the linguistic methodology for grouping the meanings of word into semantic classes is geared to study the syntactic patterns that the word participates in (e.g. common grammatical alternation.) Verb argument alternation is related to semantically unique classes, which are both transitive and intransitive, and the interpretative feature of causation relates the lexical senses. Pustejovsky points out that there are numerous examples of intransitive verbs, which have no zero-derived causative forms e.g.

1. a) The boat **sank** in stormy weather.
b) The plane **sank** the boat in stormy weather.
2. a) The ball **rolled** down the hill.
b) Bill **rolled** the ball down the hill.
3. a) The bottle **broke** suddenly.
b) Mary **broke** the bottle suddenly.
4. a) The letter **arrived** on time.
b) * The mailman **arrived** the letter on time.
5. a) My terminal **died** last night.
b) * The storm **died** my terminal last night.
c) The block tower **fell**.
6. a) * Zalchary **fell** the block tower.
b) Zalchary **felled** the block tower.

According to Pustejovsky, the sentences in (4b) – (6b) are ungrammatical. The lexical semantics should specify what is that the classes share, so that they have grammatical intransitive forms with equal characterisation of how they differ to permits no transitive form.


Other alternation patterns include, according to Pustejovsky, the conative, as shown in the following examples

7. a) Mary **shot** the target.
b) Mary **shot** at the target.
8. a) Mary **scraped** the window.
b) Mary **scraped** at the window.
9. a) The cat **touched** my leg.
b) * The cat **touched** at my leg.

10. a) Mary **shot** the arrow (at the target).
 b) *Mary **shot** at the arrow.

Sentence (9b) – (10b) are ungrammatical. Pustejovsky considers the question of how the polysemy of those verbs taking multiple forms can be represented lexically. Participation in one grammatical alternation does not sufficiently determine the semantic class of the verb. According to Pustejovsky the behaviour of a verb's semantic class can come only from acknowledging that the semantic patterns in an alternation are not independent of the information carried by the arguments characterised in the very patterns themselves.

Pustejovsky argues that alternation classification do not constitute theory. He states that another syntactic diagnostic that seems to have some theoretical utility is polyadicity more narrowly construed. Another alternation paradigm is indefinite NP deletion, as demonstrated in the following examples:

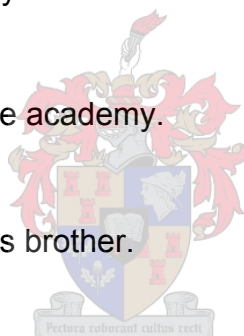
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11. (a) The woman **ate** her meal quickly.
 (b) The woman **ate** quickly.
12. (a) The dog **devoured** the cookie.
 (b) The dog **devoured**.
13. (a) John **drank** his beer feverishly.
 (b) John **drank** feverishly.
14. (a) John **gulped** his beer feverishly.
 (b) John **gulped** feverishly.
15. (a) Mary **hummed** a song, while she walked.
 (b) Mary **hummed** while she walked.
16. (a) Mary **performed** a song while she ate her dinner.
 (b) Mary **performed** while she ate her dinner

According to Pustejovsky the rule of “indefinite NP deletion” is the term for the alternation paradigm. In the examples given, there is object-drop related to an

aspectual difference between the verbs being constructed, in this case the verb **eat** denotes an activity of unbounded duration, (lexically), and **devour** denotes a transition. **Devour** is generally considered a manner specification of the verb **eat**, it carries a completive implicature that is absent from eat. **Drink** is an activity, **gulp** carries the implicature of completive aspect, **hum** is an activity, **perform** has a completive as aspect lexically.

Pustejovsky agrees as regard complement-drop, that they seem to be difficult for many verbs for this alternation. He states that no one semantic parameter will be sufficient to explain all complement drop cases. In transitive-intransitive polyadicity, there are well-documented intransitive-transitive shifts.

17. (a) John **gave** a book to Mary.
(b) John **gave** a book.
18. (a) John **gave** a lecture to the academy.
(b) John **gave** a lecture.
19. (a) John **mailed** a book to his brother.
(b) John **mailed** a letter.
20. (a) John **mailed** a letter to his brother.
(b) John **mailed** a letter.
21. (a) Bill **showed** a book to Mary.
(b) Bill **showed** a book.
22. (a) Bill **showed** a movie to the audience.
(b) Bill **showed** a movie.



Pustejovsky states that the obligation expression of the goal argument is dropped and the verb becomes a simple transitive. Grammatical alternations can be used throughout the grammar of a language to make syntactic distinctions on the basis of semantic behavior. Pustejovsky argues that using category and selectional information, as well

as grammatical alternation data, words can be grouped into semantic classes following predictable syntactic behaviors.

The oldest semantic classifications for verbs and that of aspectual or Aktionsarten. The essential idea behind this classification is that verbs and verb phrases differ in the kinds of eventualities in the world they denote. Pustejovsky points out that there are three aspectual types viz. **state**, **activity** and event, the last class sometimes is broken down into **accomplishment** and **achievement** event. He observes that the verb **walk** denotes an activity of unspecified duration: Deictically it is an event in the past, which terminated, as shown in the following examples:

23. (a) Mary **walked** yesterday.
 (b) Mary **walked** to her house yesterday.

Pustejovsky explains that the verb **walk** in (23) denotes an activity of unspecified duration. The sentence itself does not convey information regarding the temporal extent of the activity, although it is an event in the past, which did terminate. Sentence (23a) denotes an activity. Sentence (23b) conveys the same information as in (23a), but with the additional constraint that Mary terminated her activity of walking at her house, although not making explicit reference to the temporal duration of the activity. Sentence (23b) does not assert that the process has a logical culmination, whereby the activity is over when Mary is at home. This sentence denotes an accomplishment event.

Pustejovsky maintains that the verb **walk** is lexically default to an activity, there are verbs which seem to be accomplishments. The verbs **build** and **destroy**, for example, in their typical transitive use, denote accomplishment events because there is a logical culmination to the activity performed.

- 24 (a) Mary **built** a house.
 (b) Mary **destroyed** the table.

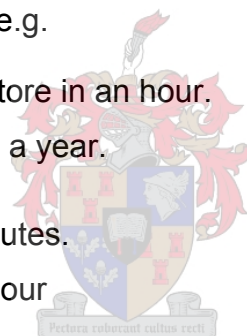
In (24a) the existence of the house is the culmination of Mary's act, while in (24b) the nonexistence of something denotable as a table is the direct culmination or consequence of her act.

Pustejovsky points out that **creation – verbs** are the best example of accomplishments. **Performance –verbs** such as **play** permit both activity usage, as in (25a) and accomplishment usages, as in (25b), depending on the complement structure.

- 25 (a) Mary **played** the piano (for hours)
 (b) Mary **played** the sonate in 15 minutes.

According to Pustejovsky, one classic diagnostic for testing whether a verb or verb phrases denotes an accomplishment is modification by temporal adverbial (i.e. frame adverbial) such as in an hour. Both derived and lexical accomplishments license modification while activities do not e.g.

- 26 (a) Mary **walked** to the store in an hour.
 (b) Mary **built** a house in a year.
27. (a) John **drank** in 20 minutes.
 (b) Mary **worked** in an hour



Pustejovsky states that the frame adverbial requires the verb or verb phrase to make reference to an explicit change of state. The change is thought of as occurring instantaneously. The change is not the gradual one, it has a point-like quality, hence modification by point-adverbial.

Pustejovsky states that adverbial modification is not restricted to achievements like with accomplishment verbs, as shown in the following examples:

28. (a) She **swam** the channel at 10:00 am.
 (b) The pianist **performed** the sanata at noon.
 (c) James **taught** his 3-hour seminar at 2:30 p.m. He delivered his lecture at 4:00 p.m.

The point-adverbial indicates the starting time of an event of some specific duration. Lexical properties of the verb can be affected by factors that cannot possibly be lexical.

29. (a) Mary **ate** cookies (activity)
 (b) Mary **ate** a cookie (accomplishment).
30. (a) Brown and Root, Inc **built** the runway in Tehran.
 (b) Brown and Root Inc **build** runaway in Asia.

A shift in meaning occurs of eat from an activity to in (29.a) an accomplishment in (29b). The lexically specified accomplishment verb build appear with a bare plural object or mass term assume an activity reading.

According to Pustejovsky the presence of a bare plural object shifts the interpretation of typically telic (or completive) event to an unbounded process. An aspectual shift resulting from pluralization of the subject of achievement predicates comes from complementation patterns with aspectual predicates such as **begin** and **finish**.

According to Pustejovsky achievement events are not grammatical as complements of the verbs in (31) but the same predicates with plural subjects, suggests an aspectual distinction.

31. (a) *John began finding a flea on his dog.
 (b) *The quests began to arrive.

Pustejovsky points out that there are two types of stative predicates: **individual-level** and **state-level**. The predicates **tall**, **intelligent**, and **overweight** are properties that an individual retains, can be identified with individual directly, they are individual-level predicates.

According to Pustejovsky properties such as **hungry**, **sick** and **clean** are identified with non-permanent states of individuals and are called stage-level predicate. This class

appears in forms of the resultative construction as the culminating predicate, as in the following examples:

33. (a) John drank himself **sick** with that cheap brandy.
 (b) Watching the commercial on TV made John **hungry**.
 (c) Bill wiped the counter **clean** before serving us our coffee.

Pustejovsky also considers the following examples:

34. (a) Bill ate himself **overweight** over the years.
 (b) John read himself **intelligent** with the Great books.

One final characteristic for distinguishing activities from accomplishments is by “imperfective paradox”, which involves entailment from progressive aspect. Pustejovsky states that entailment indicates whether an action is homogeneous in nature or has a culmination of some sort. He argues that a theory of lexical semantics should be able to account for the behavior, not just use it to classify propositions into aspectual types. Pustejovsky discusses the categorization of aspectual types for verbs, verb phrases and sentences: ACTIVITIES: **walk, run, swim drink**, ACCOMPLISHMENTS: **build, destroy, breaks**, ACHIEVEMENTS: **die, find, arrive** and STATES: **sick, know, love, resemble, think**, etc. He points out that aspectual class determines the semantic behavior of a lexical item, but the aspectual properties may change as a result of other factors, such as adverbial modification (both durative and frame), the structure of the NP in an argument position (e.g. definite vs. bare plural) or the presence of a prepositional phrase. Such non-lexical issues are, according to Pustejovsky, problems in compositional semantics of the “type-shifting” phenomenon. Pustejovsky proposes restructuring of the above classification slightly, by making reference to sub-events and to an event focusing mechanism called **event headedness**.

2.3.2 Nominal alternation

According to Pustejovsky nouns exhibit characteristic grammatical behavior, depending on their semantic category. The distinction for nominal semantics is **count versus mass**. How "stuff" is individuated determines how we talk about it, hence sand, composed of individual grains, is a mass noun and refers to undifferentiated stuff. A house is perceivable as an individuated object and is classified as a count noun. Well documented count nouns and mass nouns are selected for different quantifier types and allow different patterns of predication.

35. (a) Mass nouns: much **sand**, more **water**
 (b) Count nouns: several **houses**, every **child**.

According to Pustejovsky there are nouns that have both count and mass interpretations, as shown in the following examples:

36. (a) Texans drink **a lot of beer**.
 (b) Patsy relished **every beer she drank**.

37. (a) More e-mail is arriving every day.
 (b) Is there any e-mail for me today?

38. (a) The last e-mail I sent you was yesterday.
 (b) Every e-mail I sent gets bounced.

Pustejovsky argues that a semantic distinction related to count and mass is that between individual and group nouns, which is differentiated by predictability. Group nouns satisfy a semantic plurality requirement on selection, as shown in the following examples:

39. (a) The committee **met** for lunch.
 (b) The crowd **dispersed** after the police introduced tear gas.

According to Pustejovsky, in terms of anaphoric binding, group nouns do not parallel plural NPs completely. The noun classes are **predicative**. Both women and water, when used in full NPs refer independently to something out in the world. **Relational** nouns are dependent on another referent in terms of how **themselves** denote, e.g. **neighbor** and **brother** denote an individual relation to one individual in specific ways of how they themselves denote. The grammatical consequences of the semantic distinction give rise to the following distinctions:

40. a) The man arrived yesterday.
 b) ?The neighbor arrived yesterday.
 c) The neighbor arrived yesterday.
41. a) The brothers come home.
 b) The brothers came home together.

Pustejovsky states that nouns can denote “horizontal relations” and hierarchical relations e.g. **neighbor** and **brother** denote a horizontal relation and **father** and **daughter** denote hierarchical relations. The noun **daughter** is the dependent object in the relation and behaves differently from **father**, which is the independent individual. Contextual salience will improve acceptability of NPs.

42. a) *The daughter is in the house.
 b) John’s brother is in town.
 c) My neighbor lent me a chainsaw.
43. a) The daughters are gathering upstairs.
 b) The fathers are meeting tomorrow.

According to Pustejovsky the distinctions between count/mass, individual/group and predicate/relational are motivated by distinct grammatical behaviors as well as the semantic distinctions, which can give rise to the differences. A more traditional method of nominal classification is based on taxonomies of the speakers’ intuition or

commonsense perspective of what the nouns denote e.g. “concrete referring” nouns and “abstract referring” nouns e.g. concrete referring **woman, boy, horse** (all count nouns) **grass, water** and **gold** (mass nouns and “abstract referring” nouns: **time, place, age** and **shape**).

Pustejovsky shows that these taxonomies of entity types are common in computational treatment of language phenomenon. Selectional features were seen as a condition on lexical insertion in previous theories; sortal specification is viewed in terms of type satisfaction within an interpreted model.

Pustejovsky believes that there are important motivations in both computational and theoretical linguistics communities for modeling the conceptual or epistemological ground assumption. These motivations can differ dramatically. Pustejovsky hopes to identify the goals for the diverse communities and outline what he thinks the common goals are for the linguistic research in different approach.

2.3.3 Adjective Classes

According to Pustejovsky, the semantic of adjectives are taken to denote states. The type of stativity e.g. the individual-level vs. stage-level distinction is a useful device of distinguishing adjectives. Pustejovsky points out that the progressive aspect has the ability of stage level predicates to enter into predicates with the progressive while individual-level predicates cannot, as shown in:

44. a) The horse is being **gentle** with her rider.
 b) You're being so angry again!
 c) Stop being so **impatient**
45. a) *John is being **tall** today.
 b) *Aren't you being **beautiful** tonight?
 c) *Stop being so **intelligent**.

Pustejovsky states that adjectives can be classified by virtue of syntactically distinct behavior including the basic distinction between predicative and attributive position.

46. a) *The **alleged** criminal.
 b) *This criminal is **alleged**.
47. a) The **frightened** boy.
 b) The boy is **frightened**.

According to Pustejovsky adjectives and verbs are structurally similar, for example, there are intransitive and transitive verbs, and there are binary and unary predicative adjectives which can be seen as intransitive and transitive forms. Adjective such as old takes no complement. Adjectives such as envious and jealous are inherently relational and are transitive.

48. a) Sophia is not **old**.
 b) John is **envious** of Mary's position.

Other structural distinction differentiates adjectives, allowing movement like behavior such as **certain**, from non-alternating adjectives.

49. a) Mary is **certain** to be the next President.
 b) It is **certain** that Mary will be the next President.

Pustejovsky shows that adjectives involves the raising/control distinction seen as adjective pairs such as **easy** and **easier**.

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Adjectives such as **eager**, **anxious** and **unwilling** are subject-control predicates and have no alternating construction, while tough-movement adjectives such as **easy**, **tough**, and **difficult** enter into alternation.

50. a) It is **easy** to teach this class.
b) This class is **easy** to teach.
51. a) It is **dangerous** to drive on this road in winter.
b) The road is **dangerous** to drive on in the winter.
52. a) It is **interesting** to imagine Bill President.
b) Bill President is **interesting** to imagine.
53. a) Jim has decided to give an **easy** exam.
b) We are going to get a **difficult** exam for the final.
54. a) Bill has to take a **dangerous** road to get here.
b) John had an **interesting** suggestion.

The interpretation of the 'ellipsed' infinitival depend on local context.

55. a) John is teaching an **easy** class this semester.
b) Bill is taking an **easy** class this semester.

The “understood predicate in the NP can be determined by the governing predicate in the VP” e.g. the class is easy to teach in (55a) while it is easy to take in (55b).

2.4 INTER-LEXICAL RELATION

According to Pustejovsky Lexical semantics is the study of how words are semantically related to one another. Pustejovsky briefly examines the following classes of lexical relations:

1. Synonymy.
2. Antonymy
3. Hyponymy and Lexical Inheritance.

4. Meronymy
5. Entailment and Presupposition.

1. **Synonymy.**

According to Pustejovsky synonymy is generally the relation between words rather than concepts. He states that two expressions are synonymous if substituting one for the other in all contexts and does not change the truth value of the sentence where the substitution is made. Synonymy is basically substitutability of expressions, which is an intra-category relation, e.g. noun for noun, verb for verb, adjective for adjective, or an adverb for adverb, as shown in the following examples:

56. a) John married a beautiful **woman**.
- b) John married a beautiful **lady**.

Synonymy is still defined as sameness in meaning between two or more words. Pustejovsky provides the following examples:

57. a) Mary **traveled** by foot.
- b) Mary **walked** by foot. (verb for verb)
58. a) John married a **thin** lady.
- b) John married a **slender** lady (adjective for adjective.)

2. **Antonymy.**

According to Pustejovsk antonymy is the relation characterized in terms of semantic opposition like synonymy is properly defined over pairs of lexical items rather than concepts e.g.

- Rise – fall
 Heavy – light
 Fast – slow
 Long – short
 Near – far

Thin – stout etc.

Co-occurrence data illustrate that synonyms do not necessarily share same antonyms e.g. rise and ascend as well as fall and descend are similar in meaning yet neither fall/ascend nor rise/descend are antonym pairs.

3. Hyponymy.

According to Pustejovsky hyponymy is the lexical relation most studied in computational community, and essentially entails the taxonomic relation defined in inheritance network. For example, specifying **car** as a hyponymy of vehicle is equivalent to saying vehicle is a super-concept for **car**, or that the set **car** is a subset of those individual denoted by the set vehicle. Hyponymy refers to the relatedness of categories of certain terms that may denote sameness in meaning depending on degree of emphasis. It concerns the relation which holds more specific or subordinate, lexeme and a more general or super-ordinate lexeme. Pustejovsky maintains it is defined in terms of the inclusion of the sense of items in the sense of another e.g. **walk, run, crawling**, denoting movement/motion.

Animals

Cattle

Cow

Bull

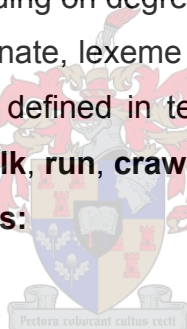
Human beings:

Man

Woman

Girl

Child



4. Meronymy.

According to Pustejovsky, meronymy entails the relation of parts to the whole. The relation is familiar from knowledge representation language with predicates or slot-names such as part of and made of. He maintains that it entails defining the necessary or optional subparts of a plan or event. It is a relation well suited to nouns, but well suited to verbs. The change in syntactic category does not overcome the fundamental meaning in differences between nouns and verbs. Even though the two activities are sequentially ordered, one is a precondition for the other.

5. Entailment and Presupposition.

According to Pustejovsky the relation entails a fairly clear distinction of an expression. A semantically entails an expression B if and only if every situation makes A true and makes B true. On the other A semantically presuppose B if and only if both (a) in all situation where A is false B is false e.g.

59. a) John killed Bill.
 b) Bill died
 c) Bill is dead.

In the above example there is a killing event and then the dying event.

Pustejovsky explains that **kill** entails rather than presuppose an event associated with dying, becomes clear when examining the negation of (59a) where no dying event occurs. The verb **manage** entails the complement event, and also carries a presupposition that the person attempts to do the action in the complement, whether it succeeds or not.

60. a) Mary **managed** to finish the exam.
 b) Mary **finished** the exam.
61. a) Mary didn't manage to **finish** the exam.
 b) Mary didn't **finish** the exam.

62. Mary **attempted** to finish the exam.

Pustejovsky maintains that the lexical semantics of a verb **manage** must presuppose that the agent of the managing event also attempts to bring this event about. The lexical semantics of verbs such as e.g. **sell** and **trade**, where possession or ownership is presupposed by the assertion of the relation.

63. a) John is selling his piano.
b) John owns a piano.
64. a) Mary is trading her piano for a computer.
b) Mary owns a piano.

2.5 THE LOGICAL PROBLEM OF POLYSEMY.

2.5.1 Varieties of Sense Extension

Pustejovsky argues that it is true that many words have more than one meaning in language, this properly is called Polysemy. He states that polysemy refers to instances where one word may have a set of different meanings. It refers to a case where a word has several very closely related senses (meanings). Pustejovsky states that the ways in which words carry multiple meanings vary. There are two types of ambiguities: contrastive ambiguity i.e. where a lexical item accidentally carries two distinct and unrelated meanings (homonymy), and systematic complementary (or regular) ambiguity.

Pustejovsky states that Homonymy is “roughly two or more words having the same pronunciation and or spelling. It is a word having the same sound and perhaps the same spelling as another, but different in meaning and origin.

65. a) Mary walked along the **bank** (the bank of a river)
b) Harbo Bank is the richest **bank** in the city.
66. a) Drop me a **line** when you are in Boston.
b) We built a fence along the property **line**.

Pustejovsky explains that the underlined items have more than one lexical sense. He maintains that whether the senses are historically related or accidents of **orthographic** and **phonological** blending are largely irrelevant for purposes of lexicon construction and the **synchronic** study of meaning. The other type of ambiguity, according to

Pustejovsky, involves lexical senses, which are manifestations of some basic meaning of the word in different context, as in the following examples:

67. a) The **bank** raised its interest rates yesterday.
 b) The store is next to the newly constructed **bank**.
68. a) John crawled through the **window**.
 b) The **window** is closed.

According to Pustejovsky these sense distinctions are **complementary polysemies**. The model of lexical meaning must be able to account for how the word refers. The word bank may refer to a building and institution or to saving money. The word window may refer to both an aperture and a physical object. The stative predicates may refer to causative acts.

Pustejovsky posits two types of senses complementation: (i) Category preserving and (ii) category changing. Pustejovsky defines logical polysemy as a complementary ambiguity, where there is no change in lexical category, and the multiple senses of the word having overlapping, dependent or shared meanings. Complementary polysemy is a slightly broader term than logical polysemy since the former describes how cross-categorical senses are related e.g. **hammer** as both noun and verb.

2.5.2 Contrastive Ambiguity.

According to Pustejovsky, the essentially arbitrary association of multiple senses is based on single word, which is complementary polysemy, and has cross-categorical ambiguity treated as a subspecies of contrastive senses. Pustejovsky refers this strategy the Sense Enumeration Lexicon (SELS) which handle the sense differentiation for both ambiguity types e.g.

69. John **shot** a few **bucks**.

Both the verb **shoot** and the noun **buck** are contrastively ambiguous. The sentence asserts either that John was successful on a hunting trip or that he spent some money gambling. The sentence may be pragmatically constrained disambiguation, since the comprehension of such an utterance may be performed in a specific context of who John is and what activity was he involved in. Pustejovsky argues that lexical disambiguation does not occur independently for one lexical item, but once the context or domain for an item is chosen or identified, the ambiguity of the other items is also constrained. A property of contrastive ambiguity does not characterize sense narrowing in logical polysemy.

70. Nadia's **plane** taxied to the terminal.

Pustejovsky maintains that both the nouns **plane** and **terminal** are ambiguous. Plane has two senses, (i) as an aircraft and (ii) as a tool used in carpentry. The noun terminal has two senses as: (i) a computer terminal and (ii) as a building at an airport, train station or bus station. Pustejovsky argues that the computational concern in the disambiguation of lexical items is the question of how to arrive at the appropriate word sense within a given sentence, given particular strategies for contextual and pragmatic priming, as in the following examples:

71. Ross was escorted from the bar to the dock.

72. (a) The judge asked the defendant to approach the bar.

(b) The defendant was in the pub at the bar/

Pustejovsky states that in sentence (72a) the judge could be at the drinking establishment or it refer to the individual as a defendant at the location. In this case is an intuitive notion of priming and context setting providing for the disambiguation of the lexical items in the sentence by virtue of the discourse within which the sentence appears.

Pustejovsky states that, from a theoretical perspective, a major problem posed by contrastive ambiguity that involve issues of discourse infencing and correct intergration of contextual information into processing, that do not require context and pragmatic information for disambiguation, so much as the predication relation in the sentence. The appropriate sense for the noun **club** is arrived at by virtue of **sortal** knowledge of the NP appearing in the inverted subject position e.g.

73. (a) Nadia's favourite **club** is the five-iron.
 (b) Nadia's favourite **club** is The Carlton.

According to Pustejovsky, the way the appropriate sense is identified in the above example: he refers this as sortally constrained disambiguation.

2.5.3 Complementary Polysemy.

Pustejovsky states that complementary polysemy entails different types of relation between senses. It entails alternations called **Figure Ground Reversals**, which include a large class of noun in language. According to Pustejovsky the sense alternation is one of the nominal alterations that can describe logical polysemies, where the noun can have systematically related senses, as shown in the following examples:

74. (a) **Count/mass alternations; lamb;**
 (i) The **lamb** is running in the field.
 (ii) John ate **lamb** for breakfast.
 (b) Container containee alternation; bottle
 (i) Mary broke the **bottle**.
 (ii) The baby finished the **bottle**.
 (c) Figure/Ground Reversals; door, window.
 (i) The **window** is rotting.
 (ii) Mary crawled through the **window**.
 (d) Product/Producer alteration; newspaper, Honda

- (i) The **newspaper** fired its editor.
- (ii) John spilled coffee on the **newspaper**.
- (e) Plant/food alternations, fig, apple.
 - (i) Mary ate a **fig** for lunch.
 - (ii) Mary watered the figs in the garden.
- (f) Process/Result alternation, examination, merger.
 - (i) he company's merger with Honda will begin next fall.
 - (ii) The merger will produce cars.
- (g) Place/People alternation; city; New York.
 - (i) John travelled to New York.
 - (ii) New York kicked the mayor out of office.

According to Pustejovsky the correct sense within a logical polysemy is identified by virtue of the context around it. What distinguishes the senses in a logical polysemy from contrastive cases is the manner in which the senses are related.

Pustejovsky states that contextual priming and discourse setting helps disambiguate contrastive sense. Contrastive senses are contradictory in nature (i.e. one sense is available only if every other sense is not available), complementary sense have weaker shadowing effect. Both senses of a logically polysemous noun seem relevant for the interpretation of noun in the context; but one sense seems "focused" for purpose of a particular context.

According to Pustejovsky complementary polysemy is also seen in other categories like adjective e.g. the word **good** has multiple meanings depending on what they are modifying.

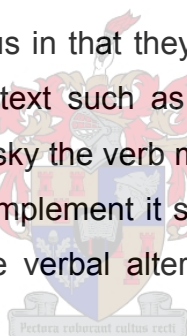
75. (a) a good car.
 (b) A good meal.
 (c) A good knife.

Pustejovsky maintains that the adjective good has merely a positive evaluation of the nominal head, and it is modifying. The nominal polysemy above does not seem to be alternation of focusing effect, but rather a functional dependency on the head being modified. Such adjective senses are classified as complementary polysemies rather than contrastive senses.

According to Pustejovsky logical polysemy can be seen as relating the multiple complement types that verbs select, as in the following examples:

76. (a) Mary **began** to read the novel.
 (b) Mary **began** reading the novel.
 (c) Mary **began** the novel.

Verbs such as **begin** are polysemous in that they must select for a multiple number of syntactic context and semantic context such as Verb Phrase, Gerundive Phrase, or Noun Phrase. According to Pustejovsky the verb must retain the same meaning, varying slightly depending on the type of complement it selects. Hence it is a legitimate logical polysemy. Other related senses are verbal alternations such as inchoative/causative alternation, e.g. The bottle broke.



77. (a) The bottle broke.
 (b) John broke the bottle.
78. (a) the window opened suddenly.
 (b) Mary opened the window suddenly.

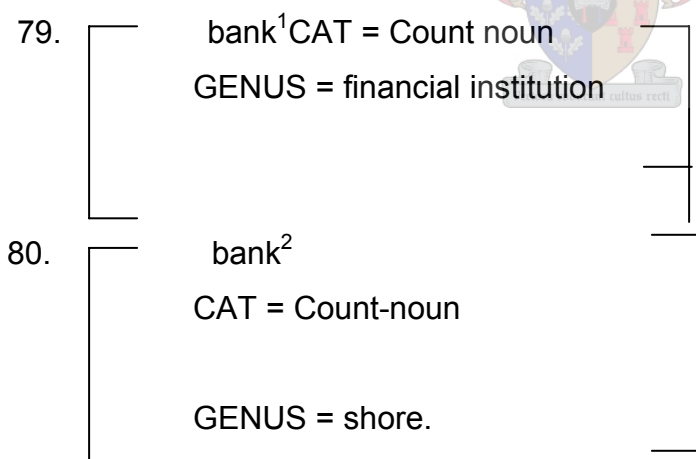
2.5.4 An Elementary Lexical Semantic Theory.

Pustejovsky presents the simplest model of lexical design, which is widely assumed in both computational and theoretical linguistic. He states that the form that such a lexical design takes influences the overall design and structure of the grammar. The major part

of semantics is on logical form and the mapping from a sentence-level syntactic representation to a logical representation in language.

Pustejovsky maintains that, to account for the polysemies, is to allow the lexicon to have multiple listings of words, each annotated with a separate meaning or lexical sense variation in a lexical form has the smallest effect on the nature of the semantic operation in grammar, namely a Sense Enumeration Lexicon (SEL). According to Pustejovsky “A lexicon L is a Sense Enumeration Lexicon if and only if for every word W in L, having multiple senses. $S_1 \dots S_n$, associated with that word, then the lexical entries expressing these senses are stored as $(W_{s_1} \dots W_{s_n})$.”

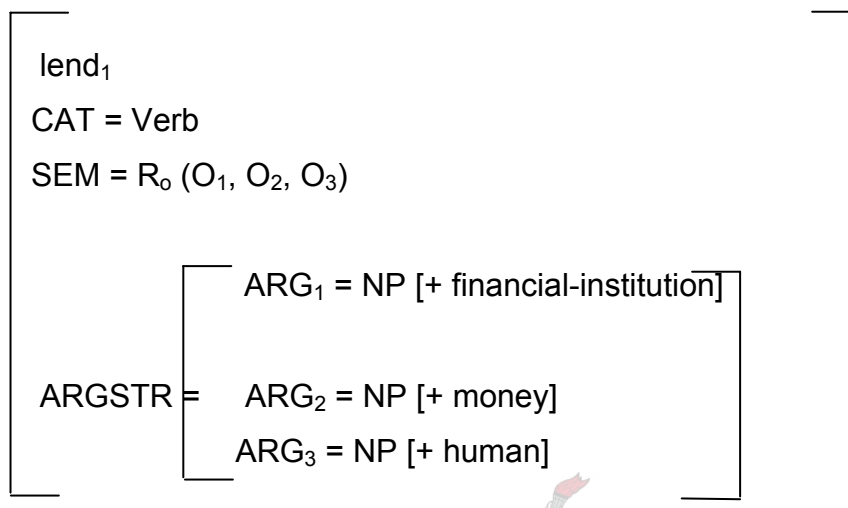
Pustejovsky argues that the fact that a word-form is ambiguous does not seem to compromise the compositional process of how words combine in the interpretation of a sentence. The word **bank** is used as standard lexical data structure of category type (CAT) and a basic specification of the genus term (GENUS) which locates the concept within the taxonomic structure of the dictionary.



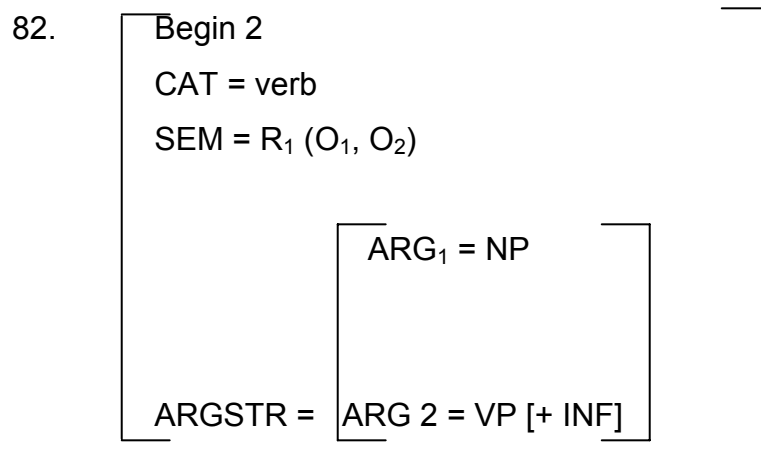
Pustejovsky states that the selectional requirements for verbs are defined from the same set of features (or types) as the genus terms themselves, disambiguation appear to be merely the process of correctly matching the features of factor and arguments from the available set of lexical entries. The verb lend might select in one of its senses (for it will

certainly have many senses in an SEL) for financial-institution as subject. Pustejovsky presents the following lexical representation:

81. The **bank** will **lend** the money to the customer.

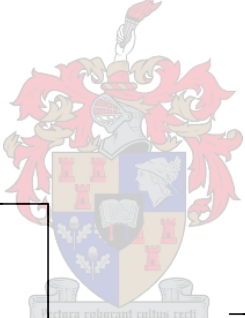


The verb **begin** has a uniquely selective approach in lexical item, in syntactic environment. The semantic property of each form indicated as a relation R₁ (O₁, O₂) can be related to each other by a lexical redundancy rule or meaning postulate e.g.



83. $\left[\begin{array}{l} \text{begin}_2 \\ \\ \text{CAT} = \text{Verb} \\ \\ \text{SEM} = \text{R2} (O_1, O_2) \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 = \text{NP} \\ \text{ARG}_2 = \text{VP} \end{array} \right] \quad [+ \text{prog}] \end{array} \right]$

84. $\left[\begin{array}{l} \text{begin}_3 \\ \\ \text{CAT} = \text{Verb} \\ \\ \text{EM} = \text{R}_3 (O_1, O_2) \\ \text{ARFSTR} = \left[\begin{array}{l} \text{ARG}_1 = \text{NP} \\ \text{ARG}_2 = \text{NP} \end{array} \right] \end{array} \right]$



According to Pustejovsky the contrastive senses are sortally constrained or differentiated, hence discourse context is not really needed to select the appropriate sense. The sortal restriction on the predicate taxi, the subject is disambiguated by strict type selection.

85. $\left[\begin{array}{l} \text{taxi}_1 \\ \\ \text{CAT} = \text{Verb P} (\square) \\ \\ \text{SEM} = \\ \text{ARGSTR} = [\text{ARG}_1 = \text{NP} [+ \text{aircraft}]] \end{array} \right]$

According to Pustojevsky, once contrastive sense has been fixed in a sentence, pragmatically constrained disambiguation facilitates the narrowing of other contrastive senses in subsequent processing. Two senses of the noun terminal are terminal₁ (computer) and terminal₂ (a build for an aircraft). The variations in verbs complementation have been encoded as enumerated lexical senses since the **Aspects – Model** appear to describe syntactic distribution.

Pustojevsky refers the cases of nominal polysemy in terms of SEL representations involve figure/ground reversal, container/containee alternations and count/mass alternations, as in the following examples:

86. (a) The **lamb** is running in the field.
 (b) John ate **lamb** for breakfast.

87. (a) Mary broke the **bottle**.
 (b) The baby finished the **bottle**.

88. (a) the window is rotting
 (b) Mary crawled through the window.



Pustojevsky maintains that the noun **lamb** is well-motivated like the listings for plane, e.g.

89.

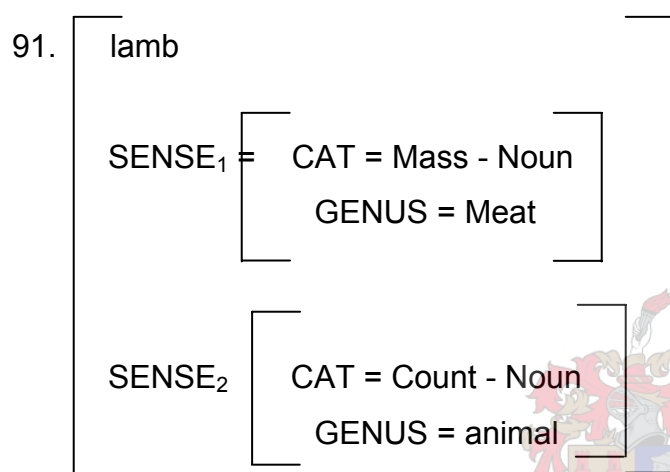
lamb ₁
CAT = count – noun
GENUS = animal

90.

lamb ₂
CAT = Mass – noun
GENUS = Meat.

The two senses are logically related but senses are distinguished by type, which is the most important consideration for compositionality.

According to Pustejovsky the purpose of modification of an SEL framework is to differentiate contrastive from complementary senses for the lexical item would be to store complementary senses in a single entry distinguished by sense – identification number. He considers the following example:



The definition, of a sense enumeration lexicon to account for the distinction is in how senses are stored. According to Pustejovsky a lexical L is a sense Enumeration Lexicon (SEL) if and only if for every word W in L, having multiple senses. $S_1 \dots S_n$ associated with that word.

- (i) If S_1, \dots, S_n are contrastive senses, the lexical entry expressing these sentences are stored as W_{s1}, \dots, W_{sn} .
- (ii) If S_1, \dots, S_n , are supplementary senses, the lexical entry expressing these senses are stored as $W_{(s1, \dots, S_n)}$.

Every ambiguity is either represented by (i) and (ii) above.

2.6 LIMITATION OF SENSE ENUMERATIVE LEXICONS (SELS)

According to Pustejovsky the standard assumption in current semantic theory requires that words behave as either active functors or passive arguments. Pustejovsky argues

that if categories are changed the way they denote the form of compositionality will change itself. Hence lexical semantics actually force re-evaluation of the very nature of semantic composition in language.

According to Pustejovsky there are three basic arguments showing the inadequacies of SELs for the semantic description of language:

92. 1. THE CREATIVE USE OF WORDS: Words assume new senses in novel contexts.
2. THE PERMEABILITY OF WORD SENSES: Word senses are not atomic definitions but overlap and make reference to other senses of the word.
3. THE EXPRESSION OF MULTIPLE SYNTACTIC: A single word sense can have multiple syntactic realisations.

2.6.1 The goals of Lexical Semantic Theory.

Pustejovsky states that the primary goal of a theory of lexical semantics and a compositional semantics are both described adequately by two points that is as mentioned: the system must be learnable and the various phenomena of polymorphisms be determined. The notion of semanticity ranges over semantic expressions rather than syntactic structures. According to Pustejovsky semanticity refers to the semantic well formedness of expressions in grammar. The standard assumptions of logical languages with truth-functional interpretations is an expression of logical languages with the truth-functional interpretations, an expression is either well formed or not, and a sentence may simply be binary judgement on whether the expression is truth-functional or not e.g.

93. (a) Mary kicked me with a foot.
- (b) Mary kicked me with her left boot.
94. a) John buttered the toast with butter.
- b) John buttered the toast with an expensive butter from Wisconsin.

2.6.2 The Creative Use of Words.

Pustejovsky states that the inadequacy of a theoretical model of description is to demonstrate that the model is unable to sufficiently account for the data being investigated. The sense enumerative model concerns the creative use of words, how words can take on an infinite number of meanings in novel context. The ambiguity of adjectives as in the context – dependence of creative words illustrates clearly the adjectives such as **fast** and **slow**, where the meaning of the predicates also varies depending on the head being modified. The SEL model requires an enumeration of different senses of words to account for the ambiguity. For example a **fast typist** refers to a person who performs the act of typing quickly

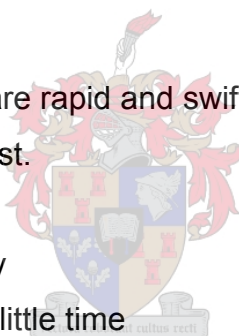
95. Rackets is a **fast game**.

The motions involved in the game are rapid and swift. The adjective **good** involves three distinct word senses for the word fast.

Fast (1) to move quickly.

Fast (2) to perform some act quickly

Fast (3) to do something that takes little time



Pustejovsky argues that for an actual lexicon, word senses would be further annotated with selectional restrictions. The object belonging to a class of movable entities should predicate **fast** (1) by the object belonging to a class of movable entities . **Fast** (3) should ideally, know how to relate the action “that takes a little time reading. Any finite enumeration of word senses will not account for creative applications of the adjective in the language. Pustejovsky considers the example phrases **the fastest motorway** and a **fast garage**.

96. (a) The Autobahn is the **fastest motorway** in Germany.

(b) I need a **fast garage** for my car since we leave on Saturday.

The adjective fast in sentence (96a) refers to a new sense fast that is the ability of vehicle, on motorway to sustain high speed. The new sense fast 4, with fast 3, given above, that is the reference to road is implicitly a reference to a route, resulting from the goal PP within the NP; subsequently allows a durative interpretation for the adjective, fast, meaning quickly traversed.

Pustejovsky states that the ability of an SEL to completely enumerate the senses for a particular lexical item is not limited or constructions by any means e.g. there are many ways to want, begin, or finish something:

97. (a) Mary **wants** another cigarette.
 (b) Bill **wants** a beer.
 (c) Mary **wants** a job.
98. (a) Harry **began** his class.
 (b) John **fished** his article.
 (c) We had better **postpone** our coffee until 11:00

Pustejovsky maintains that the goal of semantic theory is to determine the well-formedness of an expression and then provide the interpretation of that expression. There is a contextual variability with a verb want in (100a) it means “want to smoke” in (100b) it means, “want to drink” and in (100c) it presumably assumes a general “want to have” interpretation. The only way within an SEL to capture each use of want is by explicit reference to the manner of the wanting relation.

99. (a) want 1: to want to smoke:
 (b) want 2: to want to drink:
 (c) want 3: to want to have:

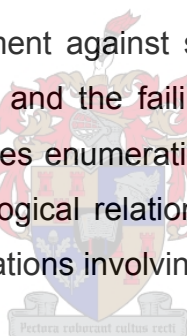
According to Pustejovsky, enumeration is unable to exhaustively list the senses that the verbs assume in new contexts. The difficulty is that computational lexicons is that word

sense enumeration cannot characterise all the possible meanings of the lexical item in the lexicon. Lexical semantics must be able to account for the creative use of words in different contexts, without allowing for completely unrestricted interpretations.

Pustejovsky argues that if an SEL is to adequately explain senses extension and the creative use of words, then there must also be in the grammar some system-giving rise to the generation of new senses. The system must be sensitive enough to generate new senses that are semantically appropriate to a particular context; hence there is not a single generator. There must be many sense generators as there are derivative senses for how an adjective applies to a noun.

2.6.3 Permeability of Word Senses.

According to Pustejovsky the argument against sense enumerative models illustrated the sense incompleteness problem, and the failing of SELs concerns the problem of **fixed senses**. The problem for senses enumeration models of lexical knowledge is the inability to adequately express the logical relation between senses in cases of logical polysemy. For example sense alternations involving nouns **window** and **door**.



100.

Window ₁ CAT = count – noun GENUS = aperture

101.

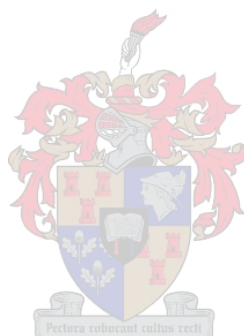
Window ₂ CAT = count-noun GENUS = phys-obj

Pustejovsky states that the problem is that the logical relation that exists between the things in the world denoted by these expressions is not expressed and these senses are embodied in the use of the word, for example

102. John crawled through the broken window.

Sense permeability involves adjectives, which have complementary senses in well-defined contexts. Pustejovsky suggests that the distinction seems to relate to the fact that the adjectives differ in their relational structure. The **sad**-adjectives do not take a prepositional object, except by adjunction i.e. sad about that. The **frighten**-adjectives being passive participles are underlying afraid-adjectives i.e. afraid of swimming. Only the non-relational adjectives permit the shift in sense. Pustejovsky holds that most of the interval or event denoting nominal carry a type of causative interpretations when modified by sad-adjective – a sad occasion is one that causes one to be sad – then the polysemy is similar to the inchoative/causative pans such as break. Another related type of adjectival polysemy involves modifiers such as noisy, which predicates of an individual or of a particular location.

103. (a) a noisy₁ car
 (b) the noisy₁ dog
 (c) a noisy₂ room
 (d) a noisy cafeteria.



Pustejovsky posits that dictionary definitions require two senses for the adjective **noisy** in (104) an object making noise, and (105) a location accompanied by noise.

104 .

Noisy ₁
CAT = adjective
ARG ₁ = phys-obj

105.

Noisy ₂
CAT = adjective
ARG ₁ = location

Pustejovsky argues that the representation above does not do justice to the meaning of adjective. They are unrelated senses, since even with the location reading there is obviously a “noise-maker” present. Mechanisms to strongly type an adjective like noisy, such that the first reading is made available through a type of indirect modification.

2.6.4 Difference in Syntactic Forms.

Pustejovsky argues that it is arbitrary to create separate word senses for a lexical item because it can participate in distinct lexical realisation – and yet is the only approach open to computational lexicons, which assume the ambiguity resolution framework. A striking example is provided by verbs such as **believes** and **forgot**. The syntactic realisation of the verb complement determines how the proposition is interpreted semantically.

According to Pustejovsky sensitivity to factivity would affect the interpretation by a question-answering system. The sensitivity of **forgot** is factive and non-factive depending on the posting separate word senses for each syntactic type, but on the other side misses the obvious relatedness between the two instances of **forgot**. Pustejovsky observes that the property of multiple sub-categorization associated with a common underlying meaning is illustrated by the term **remember**:

- 106. John probably won't **remember** that he already fed the dog. (factive)
- 107. The neighbour **remembered** to feed the dog (factive)
- 108. Mary can never **remember** where she leaves her car keys (embedded question)
- 109. Edith finally **remembered** her husband's name. (Concealed question)
- 110. John couldn't **remember** his lines for the play. (concealed question)
- 111. Mary **remembered** the keys before she left. (Elapsed factive)

Pustejovsky points out that the underlined phases syntactically appear as NPs, their semantics is the same as if the verbs had selected an overt question or exclamation.

The predicate regret takes S and NP complements, where both are interpreted factively e.g.

112. (a) Mary **regretted** that she had published the article in illustrated semantics.
 (b) Mary **regretted** the article in illustrated semantics.
 (c) John **regretted** publishing the photos in magazines.
 (d) John **regretted** the photos in the magazine.

The SELs simply list the alternative structures along with their apparently distinct but related meanings. The underlying generalisation behind syntactic form involves the range of subjects possible with causative and experience verbs.

113. (a) Driving a car in Boston **frightens** me.
 (b) Driving **frightens** me.
 (c) John's driving **frightens** me.
 (d) Cars **frighten** me.
 (e) Listening to this music **upsets** me.
 (f) This music **upsets** me.



114. (a) John **killed** Mary.
 (b) The gun **killed** Mary.
 (c) The war **killed** Mary.
 (d) John's pulling the trigger **killed** Mary.

According to Pustejovsky, the syntactic argument to a verb is not always the same logical argument in semantic relation. He suggests that the inherent inability of SELs to capture the relatedness between senses without the addition of more powerful mechanisms, such as meaning postulates, emerges from the three independent arguments is the view that the sense enumerative model of lexical description is simply inadequate for describing the semantics of natural language utterances.

2.6.5 Semantic Expressiveness.

According to Pustejovsky, in order to characterize the expressive power of natural language in terms of semantic expressiveness, it is natural to think in terms of semantic system with increasing functional power. A natural way of capturing this might be in terms of the type system which the grammar refers to for its interpretation. Pustejovsky maintains that the existence with the entire range of nominal types in natural languages all have logical polysemous e.g. fireplace, pipe, room etc. they have a meaning of both physical object and spatial enclosure. Pustejovsky further explains that the logical relationship of a door as an aperture defined by as a physical object in a particular way has been missed out. This leads to a complex typing for the nominal rather than as a simple set of individuals. The standard theory of lexical ambiguity can be characterised as a **monomorphic** language (ML) of types.

Monomorphic Languages: According to Pustejovsky a language where lexical items and complex phrases are provided a single type and denotation. In view of the assumption that every word has a literal meaning. Pustejovsky states that lexical ambiguity is treated by multiple of word senses, both for contrastive ambiguity and logical polysemy. According to Pustejovsky a theory might be termed an **unrestricted polymorphic language** (UPL) since the meaning is determined more by the context than any inherent properties of such a system are:

Unrestricted Polymorphic Language: Pustejovsky states no restriction on the type that a lexical item may assume. No operational distinction occurs between subclasses of polymorphic transformation.

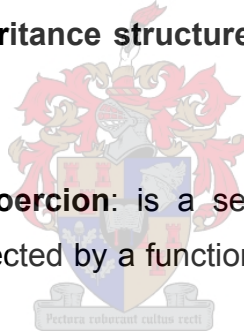
Weakly Polymorphic Language: According to Pustejovsky all lexical items are semantically active, and have a richer typed semantic representation than conventionally assumed; semantic operations of lexically-determined type changing (e.g. type coercion) operate under well-defined constraints. He argues that different subclasses of polymorphic operations are defined, each with independent properties

and condition on their application. What natural languages data require is a semantic system falling outside of monomorphous languages (ML), but well below the language of unrestricted polymorphous languages (UPL) called weakly-polymorphous language (WPL).

2.6.6 Generative Lexical Models.

According to Pustejovsky the basic requirements for a theory of computational semantics requires a generative framework for the composition of lexical meaning. Two distinct approaches in word meaning are primitive-based theories and relation-based theories. Pustejovsky states that a generative lexicon can be characterised as a system involving at least four levels of semantic representations. They include the **notion of argument structure**, specifying the number of sufficient richness to characterise not only the basic event type of lexical item, but also internal, **sub-eventual structure**; a **qualia structure** and **lexical inheritance structure** identifying lexical structure related to other structure.

According to Pustejovsky **type coercion**: is a semantic operation that converts an argument to the type which is expected by a function, where it would otherwise result in type error.



2.6.7 Strong vs. Weak Compositionality.

According to Pustejovsky semantic devices are characterised by:

- A. The degree of composition within an expression (i.e. how much unilateral or bilateral function application occurs within a phrase).
- B. How many explicitly defined senses are necessary to accomplish a unique interpretation of the phrase? The first point refers to how functionally the elements in the phrase are treated, relative to the resulting interpretation.

The second point refers to the linguistic and logical tradition of simply multiplying senses on demand for new contexts as needed to create new word senses. Compositionality is achieved by enumeration of word senses. It results in number of distinct lexical senses.

2.7 THE SEMANTIC TYPE SYSTEM.

2.7.1 Levels of Representation.

According to Pustejovsky generative lexicon is characterised as a computational system involving four levels of representations.

115. ARGUMENT STRUCTURE: Specification of number and type of logical arguments and how they are realised syntactically.
116. EVENT STRUCTURE: Definition of the event type of a lexical item and a phrase. Sorts include STATE, PROCESS and TRANSITION and events may have sub-eventual structure.
117. QUALIA STRUCTURE: Modes of explanation, composed of FORMAL, CONSTITUTIVE, TELIC and AGENTIVE roles
118. LEXICAL INHERITANCE STRUCTURE: Identification of how a lexical structure is related to other structures in the type lattice, and its contribution to the goal organisation of a lexicon.

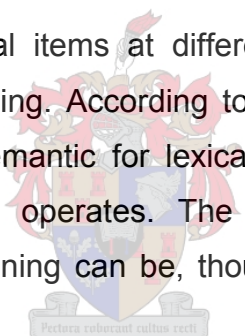
Pustejovsky states that a set of generative devices connects the four levels, providing for the compositional interpretation of words in context. The generative operations are the following semantic transformation, all involving well-formedness conditions on the type combinations:

- TYPE COERCION: where a lexical item or phrase is coerced to a semantic interpretation by a governing item in the phrase, without change of its syntactic type.
- SELECTIVE BINDING: where a lexical item or phrase operates specifically on the substructure of a phrase, without changing the overall type in the composition.

- **CO-COMPOSITION**: where multiple elements within a phrase behave as functors, generating new-lexicalised senses for the words in composition. It also includes cases of under specified semantic forms becoming contextually enriched, such as manner co-composition, feature transcription, and light verb specification.

Pustejovsky states that these three semantic transformations are important to capture the semantic relatedness between syntactically distinct expressions: Argument, event and qualia type conform to the well-formedness conditions defined by type system and lexical inheritance structure when undergoing operations of semantic composition. Lexical items are strongly typed yet are provided with mechanism for fitting to novel typed environments by means of type coercion over a richer notion of types.

The functional behaviour of lexical items at different representation will arrive at a characterisation of sentence meaning. According to Pustejovsky **meta-entries lexical conceptual** paradigm (lcps) of semantic for lexical items plays an important role in restructuring of how composition operates. The theoretical claim characterisation contain what a possible word meaning can be, though the mechanism of well-formed semantic expressions.



2.7.2 Argument Structure.

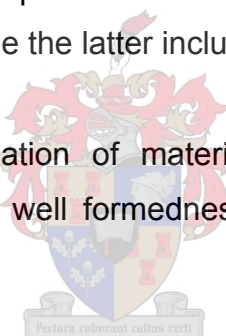
Pustejovsky illustrates a distinction between four types of arguments for lexical items illustrated for verbs:

119. **TRUE ARGUMENTS**: Syntactically realised parameters of the lexical item; e.g. "John arrived"
120. **DEFAULT ARGUMENTS**: Parameters which participate in the logical expression in qualia, but which are not necessarily expressed syntactically e.g. "John built the house **out of bricks**"

121. SHADOW ARGUMENTS: Parameters, which are semantically incorporated into the lexical item. They can be expressed only by operations of sub-typing or discourse specification e.g. “Mary buttered her toast **with an expensive butter**”
122. TRUE ADJUNCTS: Parameters which modify the logical expression, but are part of the situational interpretation, and are not tied to any particular lexical item’s semantic representation. These include adjunct expressions of temporal or spatial modification; e.g. “Mary drove to New York **on Tuesday**”

According to Pustejovsky true arguments define parameters which are necessarily expressed at syntax. This domain is generally covered by the Θ -criterion and other surface conditions on argument structure. Verbal alternations between polysemous forms of a verb, which result in the expression of true arguments, are distinguished from those alternations involving the expression of an optional phrase. It includes the inchoative/causative alternation while the latter include material/product alternation.

The optional arguments in alternation of material/product pair are called **default arguments**. They form the logical well formedness of the sentence but may be left unexpressed in the surface syntax.



According to Pustejovsky compositional operations may create an argument or shadow an argument at a phrasal projection, by virtue of compositionality in the phrase. A true argument is defaulted by virtue of complement semantics. The verb show is the true argument expressing the GOAL argument and can be defaulted by virtue of the semantics of the complement, becoming optional argument e.g.

123. (a) Mary showed her paintings to John.
 (b) Mary showed a movie (to John.)

Pustejovsky points out that the phrase shows a movie denotes the true Goal argument to a default argument giving an optional status in syntax. Default arguments can be

satisfied by full phrasal expression as a PP or as a phrase incorporated into a true argument e.g.

124. (a) Mary built a house with wood.

(b) Mary built a wooden house.

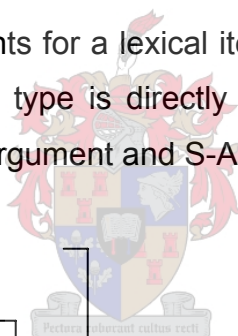
125. Mary built a wooden house out of pine.

Pustejovsky explains that the material is expressible as a shadow argument e.g. Mary built a wooden house out of pine. In (124b) the default argument has effectively been saturated indirectly as a modifier in the direct object, while in (125) further specification by the phrase out of pine licensed in the same manner as in shadow argument⁴

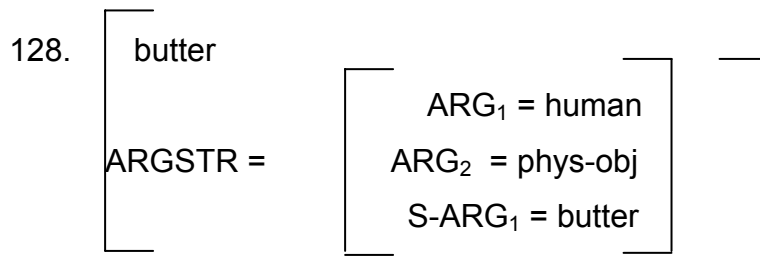
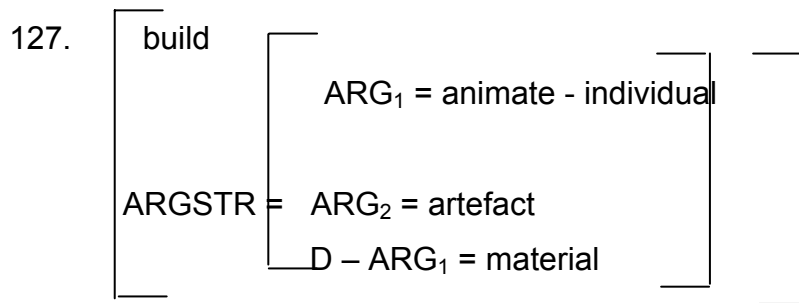
Pustejovsky illustrates the arguments for a lexical item, $ARG_1 \dots ARG_n$, are represented in a list structure where argument type is directly encoded in the argument structure ARGSTR, the D-ARG is a default argument and S-ARG is a shadow argument e.g.

126. α

ARGSTR = $\left[\begin{array}{l} ARG_1 = \dots \\ ARG_2 = \dots \\ D-ARG_1 = \dots \\ S-ARG_1 = \dots \end{array} \right]$



The lexical semantics for the verbs is represented with argument structure specification e.g.



2.7.3 Extended Event Structure

According to Pustejovsky the event variable for a verb within a single event-based semantic is listed as a single argument along with the logical parameter defined by a particular predicate or relation. He observes that an atomic view on event structure, where internal aspects of the event referred to by the single variable are inaccessible. Pustejovsky argues that finer-grained distinctions are necessary for event descriptions in order to capture some of the phenomena associated with aspect and Aktionsarten.

Pustejovsky outlined a mechanism called **Orthogonal Parameter Binding** which allows to bind into an expression from independent parameter lists i.e. argument structure and event structure e.g.

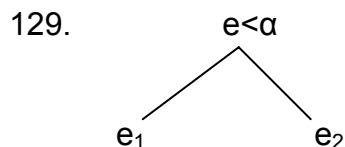
$[\text{ARGSTR} = \text{ARG}_1, \text{ARG}_2 \dots \text{ARG}_n]$

$[\text{EVENTSTR} = \text{EVENT}_1, \text{EVENT}_2 \dots \text{EVENT}_n]$

The semantics of the verb is centrally defined by the qualia, but constrained by type information from the two parameters. The predicators in the qualia refer directly to the parameters:

QUALIA = [... [Qi = PRED (EVENTj, ARGk)]...]

The events can be sub-classified into three sorts: PROCESS, STATES and TRANSITIONS. According to Pustejovsky evidence from unaccusativity and the varied nature of causative constructions shows that this notion of event structure does not fully capture the underlying semantics of unaccusative constructions, with respect to how the subevent project to syntax. According to Pustejovsky an event structure with structured subevents are show as follows:



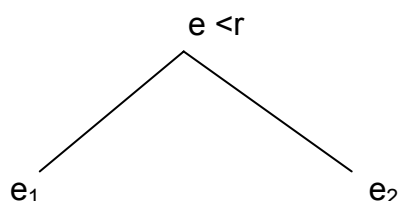
This can be defined as an event tree structure in terms of the relation of exhaustive ordered part of," $< \alpha$. The event e_3 is a complex event structure constituted of two sub-events, e_1 and e_2 , where e_1 and e_2 are temporally ordered such that the first precedes the second, each is a logical part of e_3 and there is no other event that is part of e_3 . According to Pustejovsky event headedness provides a way of indicating a type of foregrounding and back-grounding of event arguments. An event structure provides a configuration where events are not only ordered by temporal precedence for an event e is provided by the HEAD marker, annotated as e .

Pustejovsky explains that when adjoined to predicates denoting transitions, prepositional and adverbial phrases can only modify the entire event, but can also take scope over the individual sub-events e.g.

- 130 (a) John ran home for **an hour**
 (b) My terminal died for **two days**.
 (c) Mary left town for **two weeks**.

- (d) Peter left Phalaborwa for **some time**.
- (e) John stayed in Cape Town for **a month**.

The tree structure is illustrated as follows:



[run (j)] [at-home(j)]

Pustejovsky maintains that the process and states license durative adverbials, yet modification by an adverbial in (130) is grammatical, even though the sentences denote telic events. The interpretation has the adverbial modifying the duration of the final state, in (130a) John spent an hour at home in (b) the terminal was dead for two days in (c) Mary was out of town for a period of two weeks in (d) Peter was out of Phalaborwa for some time, and in (e) John was in Cape Town for a period of a month.

Pustejovsky states that similar phenomenon occurs with left headed events (e.g. TRANSITIONS) when modified by certain manner adverbs such carelessly and quietly, namely, modification is over the initial (headed) sub-event e.g.

131. (a) John built the house **carelessly**.
 (b) Mary **quietly** drew a picture.
 (c) Mary shifted the glass **carefully**.
 (d) The accident occurred **unexpectedly**.

In (131a) carelessly modifies the act of building which brought the house into existence.

2.7.4 Qualia Structure.

According to Pustejovsky the structural representation which gives the relational force of a lexical item is called qualia structure. In some sense a generative lexicon analyses all lexical items as relational to a certain degree but the manner in which this property is expressed functionally differ of course from category to category as well as between semantic classes.

According to Pustejovsky qualia structure specifies four essential aspects of words meaning (or qualia):

- CONSTITUTIVE: the relation between an object and its constituent parts.
- FORMAL: that which distinguishes it within a larger domain.
- TELIC: its purpose and function
- AGENTIVE: factors involved in its origin or “bringing it about”

According to Pustejovsky by looking at modes of explanation for a word a permit for a richer description of meaning than either a simple decompositional view or a purely relational approach to word meaning would allow. The qualia are in fact structure like phrase structural description for syntactic analyses, which admit something similar to transformational operations in order to capture polymorphic behaviour as well as sense creation phenomena.

Pustejovsky discusses two general points that should be made concerning qualia roles:

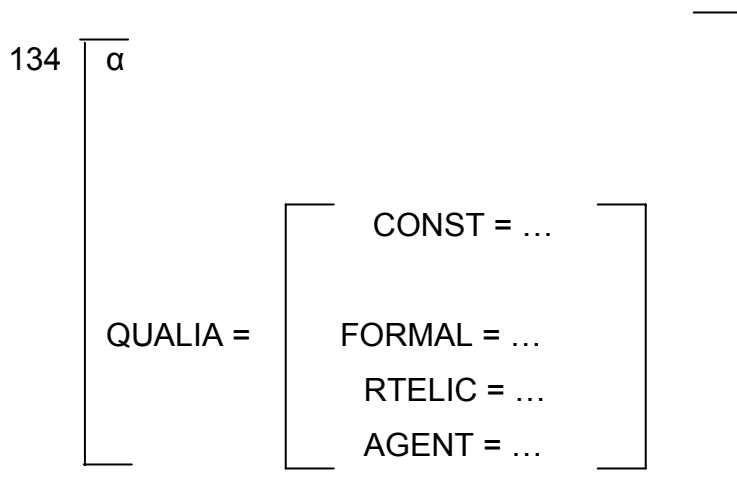
132. Every category expresses a qualia structure;
133. Not all lexical items carry a value for each qualia role.

The first point denotes how a generative lexicon provides a uniform semantic representation compositionally from all elements of a phrase. The second point views qualia as applicable or specifiable relative to particular semantic classes.

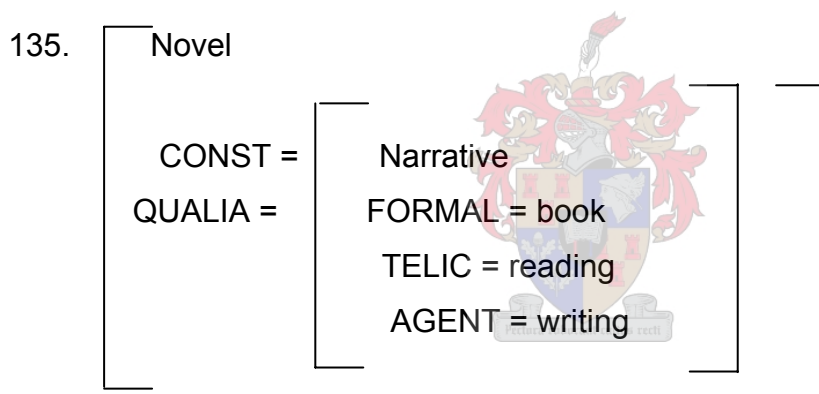
According to Pustejovsky qualia structure encodes the meaning of nominal. Quale in some sense is a set of properties or events associated with a lexical item which best explain what that word means. For example the nouns **cookie** and **beer** mean that they are foodstuff and a beverage respectively. **Cookie** describes a particular kind of object, the noun foodstuff denotes making functional reference to what we do with something i.e. how it is used for. The term is defined in part by the fact that food is something one eats, for a specific purpose.

Pustejovsky explains TELIC quale for the noun food encodes a functional aspect of meaning represented as [TELIC – eating]. He also discusses a distinction between semantically related nouns novel and dictionary stems from what are used for, with these objects that are different. Though both objects are books in general sense, their uses are different; a novel is for reading and a dictionary for consulting. Hence, the respective qualia values encoding functional information for novel and dictionary are [TELIC = reading] and [TELIC = consulting]

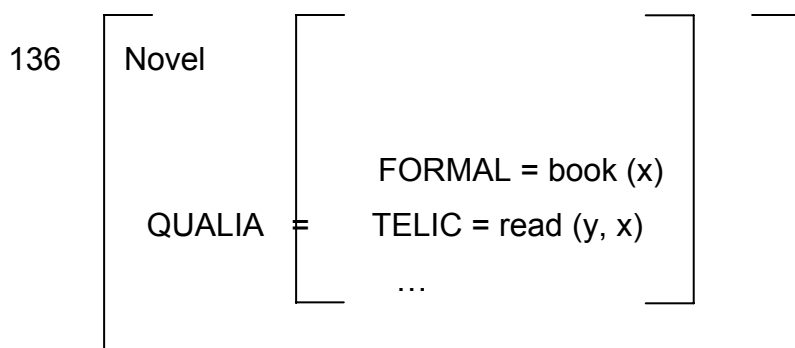
According to Pustejovsky these distinctions are not the only way these concepts differ, the structure of the text in a novel is characteristically a narrative or story, while dictionary is by definition a listing of words. He suggests that these distinctions are captured by the CONST(constitutive) role expressing the internal structural similarity as expressed in identical FORAMAL roles, novel and dictionary differ in how they come into being. The generic feature structure as the initial representation for qualia structure is as for a lexical item e.g.



The listing in 134 above tells nothing about a particular lexical item denotes. The qualia values for an item, e.g. **novel** is given s follows by Pustejovsky:



According to Pustejovsky the solution to treat qualia values as expressions with well-defined types and relational structure for an argument to relation read are explicitly given in 136 below indicating the proper binding of predicating term:



According to Pustejovsky the expression in 136 above is equivalent to the λ – expression as a partial denotation of the noun semantic for novel: e.g.

137. λX [novel (X) A ... TELIC = λy [read (y,X)] ...]

To see **where** contextual information come from to derive the “sense in context” effect 138 below illustrate the verbs **begin** and **finish** to determine how these readings are derived, e.g.

- 138 (a) Mary **began** a novel.
 (b) John **finished** the cigarette.
 (c) John **began** his second beer.

Pustejovsky explains that qualia structure enables NOUNS and consequently the NPs containing them, to encode information about particular properties and activities and associated with them. It provides the verb, which governs the complement NP with the information required for “**contextualizing the sense**” of begin or finish.

According to Pustejovsky a stative predicate corresponds to the FORMAL role in the qualia structure e.g. that state of affairs which exists without reference to how it came about. For example, the predicate tall might be ignoring the details of argument structure e.g.

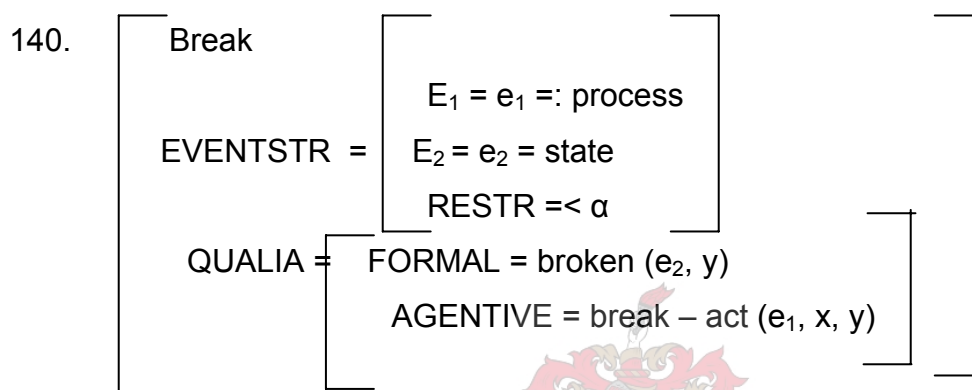
139.

tall EVENTSTR = [E = e ₁ : state] QUALIA = [FORMAL = tall (e ₁ , X)]

The semantic motivation or generalisation is captured by such a strategy. Pustejovsky argues that the distinction between stage-level and individual-level predicate is actually no one of event-type, but rather is a qualia-based distinction, where stage level

predication involves reference to the bringing into being of the resulting state i.e. the AGENTIVE quale.

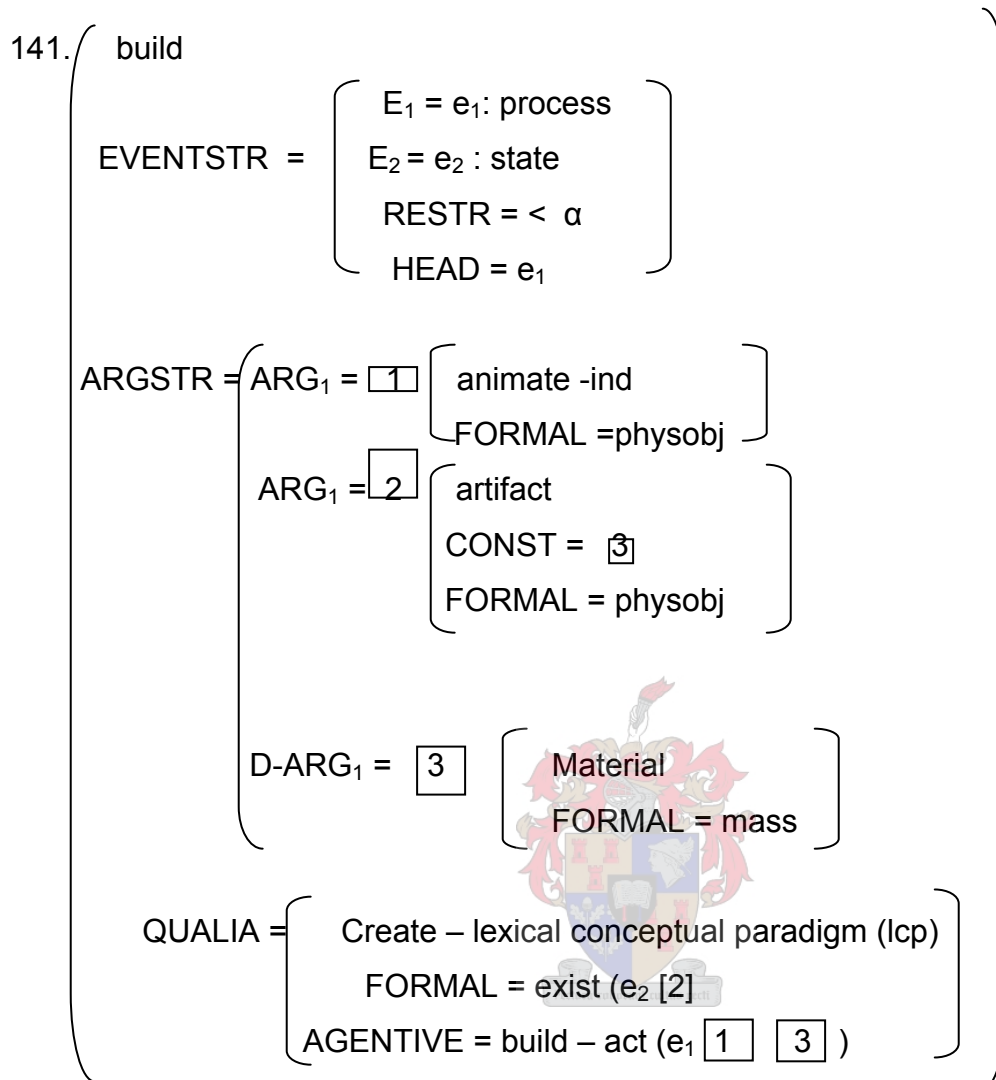
Pustejovsky discusses the qualia structure associated with causative predicates (i.e. TRANSITION). These verbs are typically analysed as involving an initial act or process followed by a resulting state. These two phases map directly into the AGENTIVE and FORMAL qualia roles e.g. the transitive form of **break**



The above example relates specific events and relational expressions to particular qualia roles. Pustejovsky maintains that predicates denoting process are distinguished according to which mode of explanation, the predicate is associated with. He considers the distinction between AGENTIVE AND FORMAL processes. The distinction in qualia binding is that processes are quantifiable in different ways, one of which is to specify explicitly the resulting state in the FORMAL role, by means of co-composition.

2.7.5 The Interaction of Semantic Levels.

Pustejovsky integrates the three levels of argument, event and qualia structure, in order to construct a uniform language for lexical semantic representations. According to Pustejovsky there are two TRUE ARGUMENTS and one DEFAULT ARGUMENT, to analyse the verb as a lexical accomplishment, containing two sub-events need a process and a resulting state e.g.



According to Pustejovsky the process is identified as that AGENTIVE act involving both the deep syntactic subject, ARG₁ and the default argument, D-ARG₁, which is related to the logical object by the CONSTITUTIVE relation of ARG -2. The FORMAL role expresses the resulting state of there being such an object ARG-2. The individual is defined as being made of the material of the default argument D-ARG₁ and yet is logically distinct from it, e.g.

142. John is building a house.

143. John built a house.

According to Pustejovsky there are several consequences of the above representation. One result is that the binding problem in the imperative (143) is overcome in a fairly natural way. There is no assertion that a house exists in this atelic form of the event. The representation asserts no more than that the substance making up some (future) house has been acted upon.

Pustejovsky argues that the notion that concepts are associated with other concepts by some sort of explicit listing is a very new or controversial notion. He further argues that A_1 and computational approaches to word meaning have been concerned with providing “Looks” on word meanings, in order to facilitate inference. According to Pustejovsky Qualia structure shares with these traditions the goal of capturing the meaning of a word as it relates to reasoning viewed in broader sense. He further says that the principal motivation for qualia structure is not simply a listing of properties for a word. It can rather only be appreciated in the context of the generative mechanism in the grammar, which allows speakers to use the language creatively.

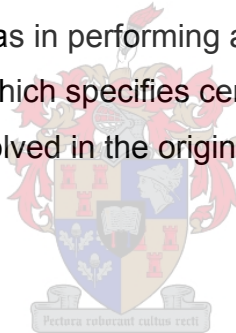
2.8 QUALIA STRUCTURE

Pustejovsky examines the question of how items encode semantic information in the qualia and what the qualia structure conveys. He argued for associating functional semantic information with all categories and how it helps achieving a more generative description of lexical sense derivation. Pustejovsky’s point is to explore more the syntax of qualia structure and its descriptive and explanatory role in a theory of word and meaning and compositionality.

2.8.1 Models of Explanation

According to Pustejovsky lexical semantic structure is defined by the four interpretative levels $\langle A, E, Q, U \rangle$ and there are four basic roles that constitute the qualia structure Q for a lexical item:

144. CONSTITUTIVE the relation between an object and its constituents, or proper points.
- (i) material
 - (ii) weight
 - (iii) Parts and component elements
145. FORMAL: that which distinguishes the object within a larger domain.
- (i) orientation
 - (ii) magnitude
 - (iii) shape
 - (iv) dimensionality.
 - (v) Colour
 - (vi) Position.
146. TELIC: Purpose and function of the object.
- (i) Purpose that an agent has in performing an act.
 - (ii) Built-in function or aim which specifies certain activities.
157. AGENTIVE: Factors involved in the origin or “bringing about” of an object.
- (i) creator
 - (ii) Artifact.
 - (iii) natural kind.
 - (iv) causal chain.



According to Pustejovsky there are many ways of approaching the definition of a word and qualia seem to be the first simple listing of case roles or named features associated with lexical items. Qualia structure relates to the set of semantic constraints to understand a word when embedded within a language. Pustejovsky states that the definition to do with dramatisation or grammatical behaviour. He also points out that the models of semantics assume that words have simple denotations and methods of composition borrowed from general logical inference mechanisms.

According to Pustejovsky qualia provides the structural template over which semantic transformations may alter the denotation of a lexical item or phrase. He further states

that these transformations are the generative devices of type coercion, which formally map the expression to a new meaning. These operations syntactic and semantic environment within the phrase e.g. the combination of the qualia structure of an NP with that of a governing verb brings the richer notion of compositionality emerging in the creative use of words and the “sense in concept”

According to Pustejovsky qualia “suggests” interpretation of words in context; e.g. on how NPs of both in subject and complement position specifying the interpretation of the verb use in the sentence in 148 and NPs in 149.

148. (a) John used the **new knife** on the turkey.
 (b) Mary has used **soft contact lenses** since college.
 (c) This car uses **unleaded gasoline**.
 (d) My wife uses the **subway** every day.

149. (a) The toners used in **copying machine**.
 (b) The yeast used in **beer**

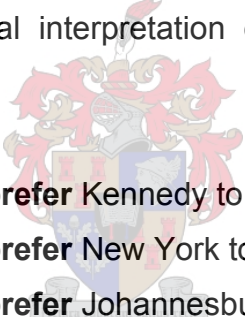
Pustejovsky explains that in sentence (148a) a knife is a tool that can cut and permits an economy of expression whereby mention of a particular activity of cutting may be elapsd. In sentence (148b) contact lenses are visual aids, refers to the act of wearing them. The utility of a verb use is semantically light. The NPs in the sentences (149) illustrate the distinction where the objects in (149a) are understood as standing in a functional part-of-relation, and in (149b) the substance is a material use in the process of making beer. The factors are two-fold:

- (i) the qualia structure for each phrase in the construction and
- (ii) a richer made of composition e.g.

- *150.(a) Mary **enjoyed** the movie last night (watching).
 (b) John quite **enjoys** his morning coffee (drinking).
 (c) Bill **enjoyed** Steven King’s last book (reading)

Pustejovsky postulates that there are many ways of enjoying something these sentences are facilitated by default interpretations of properties and activities associated with objects. The qualia of an object can be seen as the initial points from which to construct interpretations that ill-formed. Hence, the Telic roles for movie, coffee and book project the activities of watching the movie, drinking his morning coffee and reading Steven King's last book, respectively to the interpretation of the VP.

According to Pustejovsky the contextualizations of sense for a verb do not come from the semantics of the complement, but can be influenced by the subject as well. In sentence (151a) there are two factors contributing to the interpretation of the elapsed predicate, the qualia structure associated with the subject NP and the double object NPs. Pustejovsky explains that the complements are identified as names of airports, allowing a default co-compositional interpretation of **landing, taking off**, as in the following examples:

- 
151. (a) Most commercial pilots **prefer** Kennedy to Logan,
 (b) Most commercial pilots **prefer** New York to Boston.
 (c) Most commercial pilots **prefer** Johannesburg to Stellenbosch.

The sentence in (152) hold the semantic contribution made by the AGENTIVE nominal, the interpretation is not “suggested” by the VP semantics.

152. (a) Midwestern fish farmers **prefer** catfish this year.
 (b) Booksellers usually **prefer** cookbooks to textbooks around Christmas.

Pustejovsky states that in the above sentences the case is not that fish farmers prefer to eat catfish and the book sellers prefer to read the books, in real sense or actual fact, the farmers are raising the fish and the book sellers are selling the books. The TELIC roles from the AGENTIVE nominal override the VP – internal interpretation.

According to Pustejovsky the utility of qualia-based representation extends to other categories to the phenomenon of adjectival sub-modification.

153. (a) a **bright** bulb.
 (b) an **opaque** bulb.
154. (a) a **fast** typist.
 (b) a **male** typist.
155. (a) a **careful** driver.
 (b) a **careless** driver.
156. (a) a **good** driver.
 (b) a **bad** driver.

The adjectives **bright** and **fast** are event predicates, modifying some aspect of the head noun. They make reference to a qualia derived event associated with a noun. **Bulb** is a reference associated to the function it had, namely TELIC role which is illumination.

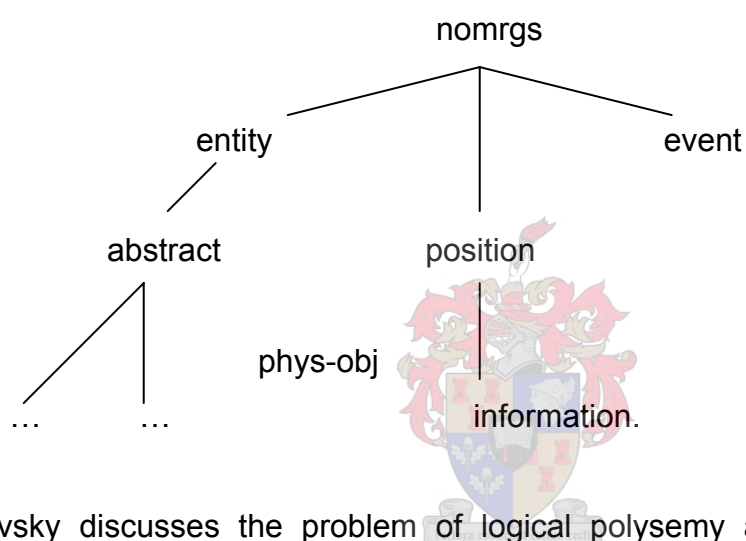
Pustejovsky maintains that an AGENTIVE nominal such as **typist** is TELIC makes direct reference to the process denoting verb from which the nominal is derived. The adjectives opaque and male make reference to the FORMAL role of the head. According to Pustejovsky, adjectives are able to sub-select on the basis of typing information contained within the qualia structure of the phrases they **modify**, though it does not show how it is accomplished. The adjectives do not select a particular type which is or not available within the value of a quale role.

2.8.2 The Qualia Structure of Nominals.

Pustejovsky states that the typing system necessary to characterise the semantics of NPs, and the logically polysemous behaviour of nominal of window and door. The terms of nominal viewing the semantic classification from the perspective of event structure, argument structure and qualia structure show how fine-grained distinctions are possible

in the semantic behaviour of the nominal types based on the interaction of argument and qualia structure.

According to Pustejovsky the type system includes the type hierarchy and the constraint system operating over the types. He states, for example, that the hierarchy below illustrates how features are organised in a lattice structure where norms refers to the upper bound type for the type entity, proposition and event. The linguistic aspects of how a generative lexicon makes use of typed feature structures.



Pustejovsky discusses the problem of logical polysemy and how nominal such as **window** and **door** carry two distinct interpretations, each logically related to the other.

157. (a) John crawled through **the window**
 (b) Mary broke **the window**.
- 158 (a) Mary painted **the door**.
 (b) Mary walked through **the door**

In the above sentences, Pustejovsky explains, each noun has two word senses: a physical object denotation and an aperture denotation. Pustejovsky characterises the meaning of “Double Figure-Ground” nominal as inherently rational, where both arguments are logically part of the meaning of the noun. In the true corresponding to the two senses, there is a default argument.

159. (a) The **newspaper** attacked the President for raising taxes.
 (b) Mary spilled coffee on **the newspaper**.
 (c) John got angry at **the newspaper**.

Pustejovsky points out that notion of an lcp allows not treating these as distinct senses, but as logical expression of different aspects to the meta-entry for newspaper. These alternations analyse the nominal alternations exhibiting following instances of logical polysemy.

160. (a) Count/Mass alternation, lamb.
 (b) Container/Containee alternations; bottle.
 (c) Figure/Ground Reversals; door, window.
 (d) Product/Producer diathesis, newspaper, Honda.
 (e) Process/Result diathesis, examination, and merger.
 (f) Plant/Food alternation, fig, apple.
 (g) Place/People diathesis, city, New York.

The application rule of conventional rules of projection and abstraction are needed. According to Pustejovsky two types are able to combine to become a complex type treated as a coercion type. The lcp is represented by the type cluster consisting of the two base types and its dotted type, i.e. the lexical conceptual paradigm (lcp). Pustejovsky states that the paradigm of types associated with a lexical item by virtue of the type constructor lcp. The senses for a noun such as door represented as types phys-obj and aperture respectively. Pustejovsky states that the lcp result from the type constructor lcp types, as in the following example:

161. phys-obj. aperture –lcp = {phy-obj. aperture, phys-obj, aperture}

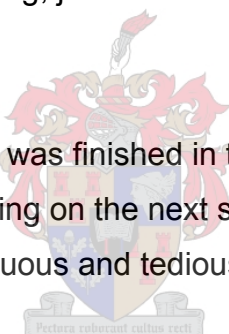
The above example is an lexical conceptual paradigm (lcp) assigned to the lexical item **door**. All the three types are available for expression by the noun. According to

Pustejovsky the lexical conceptual paradigms illustrate that syntactic information is inheritable between lexical items.

To illustrate this point Pustejovsky considers the class of process/result nominal such as merger, joint venture, consolidation, etc. The nominal are ambiguous between process interpretations, (the act of merging) versus the resulting entity or state (the merger which results). According to Pustejovsky it is a property of the whole paradigm indicating that the alternation can be captured by an lexical conceptual paradigm (lcp).

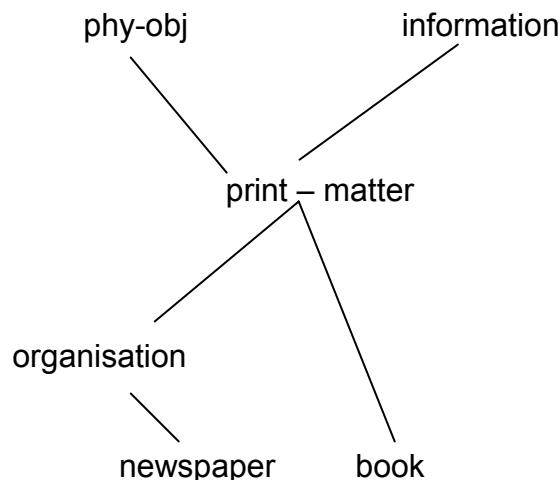
According to Pustejovsky, the above statement suggests that there are three senses available to a lexical item associated with an lcp constructed from two base types. The above merger of sense essentially allows reference to the entire event of the merging as well as either process or result reading, just as the tensed sentence equivalent of the NP does, as in the following examples:

162. (a) The house's construction was finished in tow months.
 (b) The construction is standing on the next street.
 (c) The construction was arduous and tedious.



The above sentences make reference to the entire dotted type, the process and the result of the process respectively e.g. the hierarchy illustrating what the association is between types resulting from the constructor lexical conceptual paradigm (lcp). With the view of types the sense of the nouns newspaper and book explain the difference in logical polysemies available to nouns, as shown in the following examples:

163.



2.8.3 The Interpretation of the FORMAL Quale.

According to Pustejovsky the most familiar equivalence class associated with nouns is its basic categories description. The FORMAL quale distinguishes an object from a larger set. He states that there are two possible structures associated with the FORMAL quale.

164. (a) **Simple typing:** Value for FORMAL role is identical to sortal typing of the argument.
- (b) **Complex (Dotted) Typing:** Value of FORMAL role defines the relation between the arguments of different type.

Pustejovsky explains that in the first case, the typing of an argument for a nominal may exhaustively define the information contributed by the FORMAL quale. The NOUNS denoting simple types (and not dotted types), the FORMAL quale is itself the typing restriction on the argument structure (i.e. the one referential argument). Such a case has the quale structure minimally.

$$165. \left[\begin{array}{l} \alpha \\ \text{ARGSTR} = [\text{ARG}_1 = x: r] \\ \text{QUALIA} = [\text{FORMAL} = x.] \end{array} \right]$$

Pustejovsky states that **man** and **woman** are sorts of human distinguished by gender, a binary characterising predicate. The distinction is inherent in the compositional make-up of the separation of the two sorts within the type man and hence the feature is represented as a CONSTITUTIVE distinction, utilising the predicate male, as shown belowL

$$166. \left[\begin{array}{l} \text{man} \\ \text{ARFSTR} = [\text{ARG}_1 = X: \text{human}] \\ \\ \text{QUALIA} \left[\begin{array}{l} \text{CONST} = \text{male}(x) \\ = \text{FORMAL} = x \end{array} \right] \end{array} \right]$$

The complex objects denoting dotted types are implicitly rational NOUNS viz: door, book, newspaper, window are as well process-result alternating nominal such as destruction and examination are classic cases of logical polysemy is encoded directly into the type of the object in the following manner. For a noun α denoting a complex (or dotted) type e.g. T_1, T_2 , the FORMAL quale defines how the arguments are related to each other. The type of the overall nominal is the complex type, as illustrated below:

$$167. \left[\begin{array}{l} \alpha \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 X : T_1 \\ \text{ARG}_2 Y : Y_2 \end{array} \right] \\ \\ \text{QUALIA} = \left[\begin{array}{l} T_1 \cdot T^2 - \text{lcp} \\ \text{FORMAL} = P(Y, X) \end{array} \right] \end{array} \right]$$

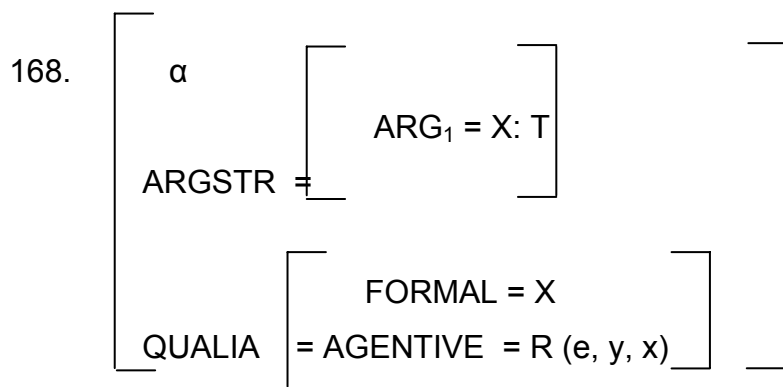
According to Pustejovsky, to conform to the behaviour of dotted types, to the FORMAL quale defining the relation between arguments, there must be reference to the dotted argument x-y in the qualia structure for the representation to be well formed e.g. R (e, w,

$\chi.y$). Example illustrating this point is the noun *book* and the related verb **read**. The activity of reading requires not just that the complement is information or prepositional in nature, but that it is “readable”, that it must have some physical manifestation in order to be interpreted as symbolic.

According to Pustejovsky having only the property of physical manifestation is not sufficient for something to be readable, it must be something one can “read” that is it must be informative. Pustejovsky argues that an alternative interpretation of the dotted object is possible. One may build the relation between the types specified in the FORMAL role directly into the dot object, e.g. the resulting type lattice. Pustejovsky states that judging between these alternatives seems difficult, since the exact semantics of the resulting types is not yet well understood. The relations’ possible in the FORMAL quale, which defines how the types are related, must be constrained in a way that it does not give rise to unattested complex types in language.

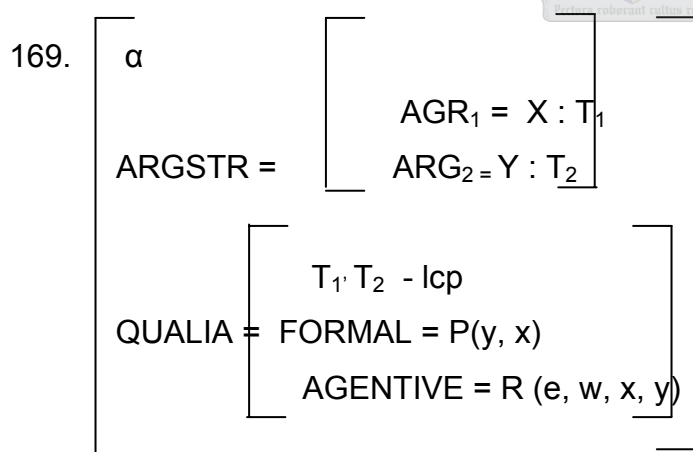
2.8.4 The Interpretation of the AGENTIVE QUALE.

According to Pustejovsky the manner in which something comes about is an important mode of explanation for distinguishing natural kinds from artifacts. How something comes about is an important mode of explanation for distinguishing objects and events. Pustejovsky argues that if the lexical form is a NOUN, the AGENTIVE is represented as an event predicate where the object being defined is typically bound to the second argument of the relation.



According to Pustejovsky the representation in (168) above corresponds to the semantics of artifacts. Viewed from the constraint of AGENTIVE, qualia coming into being, objects such as cookies, cakes and bread are typically baked. The process of baking, module such as objects, is a creative activity, while relative to objects such as potatoes, carrots and other natural kind, is simply a change of state predicate. According to Pustejovsky certain objects come into being by virtue of an activity which can otherwise simple change the internal state of an object. The sense is the same, but manifests itself with overall effects differently resulting in the “sense in context” phenomenon.

Pustejovsky points out that the explanation of what brings something about is of course not restricted to nouns, and within nouns certainly not to artefacts and simple typed object. He explains that the machinery of dotted types can provide a unique value for the AGENTIVE quale of a lexical item. The methodological goal of the Generative Lexicon is to associate individual qualia distinction, except when motivated by the semantic of particular lexical items. The AGENTIVE may refer to the dotted argument directly, as shown below:



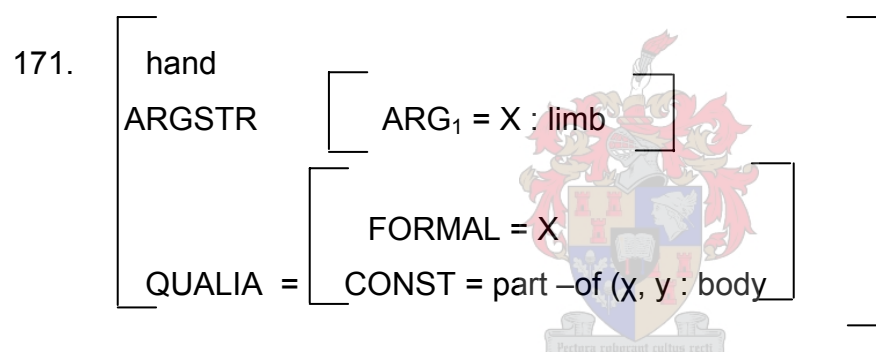
2.8.5 The Interpretation of the CONSTITUTIVE QUALE.

According to Pustejovsky the CONSTITUTIVE (henceforth-CONST) quale refers not only to the parts or material of an object, but defines, for an object what that object is logically part of, if such a relation exists. The relation part-of allows for both abstractions:

170. (a) $\lambda X = Y$ [part – of (Y.X)]

(b) $\lambda X = Y$ [part – of (X, Y)]

In the examples given above the function in (170a) defines the more conventional part – of – relation while (170b) defines the relation between e.g. hand and body. The noun hand below shows an example of how it encodes what it is logically a part of:

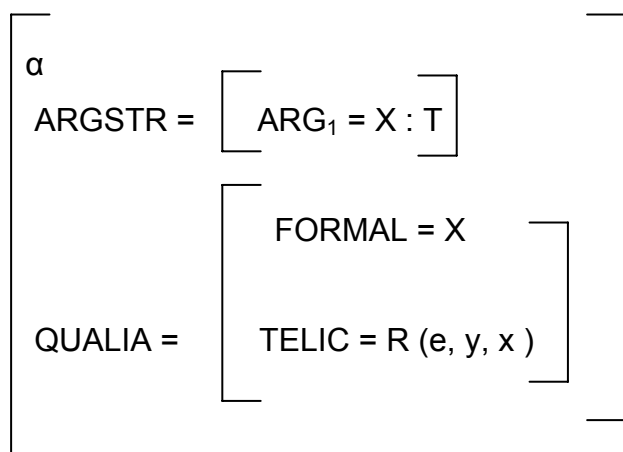


The relation in the CONST allows for reference to what something is constituted of as well as what it constitutes, in part, e.g., a hand is part of a body, and a body has a hand.

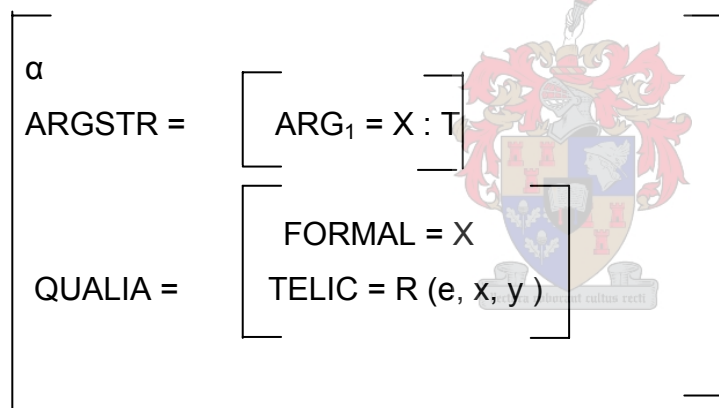
2.8.6 The Interpretation of the TELIC Quale.

Pustejovsky states that the TELIC quale defines what the purpose or function of a concept is, if there is such a constraint associated with it. Rather than viewing the semantic functions associated with a lexical item (or concept) in terms of traditional thematic role descriptions. Pustejovsky argues that lexical knowledge encodes the modes of explanation associated with a word. There is no simple one-to-one mapping between O role and qualia. How TELIC quale captures aspects of several different O-roles, but cannot be associated with any one of them exhaustively mode of TELIC.

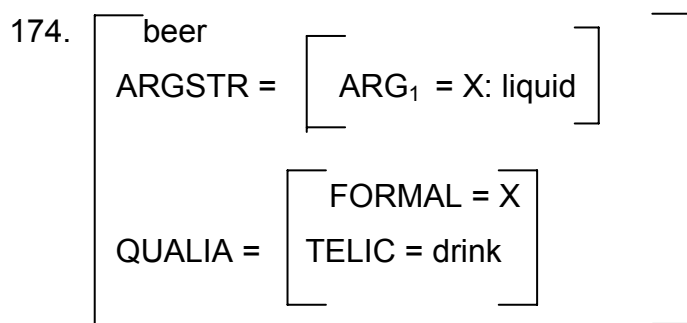
172. Direct TELIC: something, which one acts on directly.



173. Purpose Telic : something which is used for facilitating a particular activity.



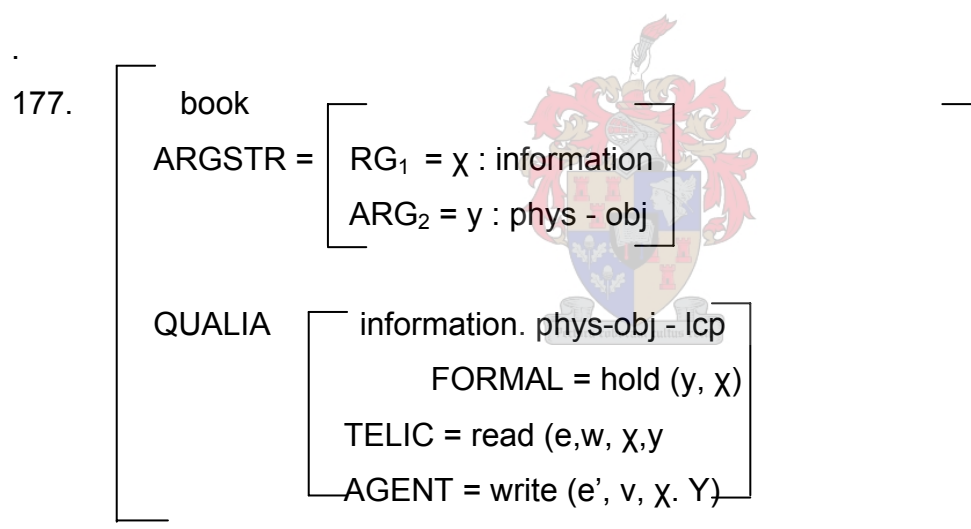
Pustejovsky refers to the first type the TELIC quale for a noun such as **beer**, where reference to the activity of drinking incorporates a variable for a noun as object of the predicate **drink**. The object's purpose is the activity given in the TELIC role.



According to Pustejovsky these sorts of relations between types of qualia that allow for some of the alternations seen in agents and instrumentals sharing causative structure

175. (a) The hammer broke the glass.
 (b) Mary broke the glass with the hammer.
176. (a) The knife cut the bread.
 (b) John cut the bread with the knife.

Book can express the TELIC of a dotted type by direct reference to the dotted argument directly; read (P, w, x, y). The representation of the TELIC for dotted types and the AGENTIVE quale of **book** given above represent the complete qualia structure, as shown below:



Pustejovsky explains that the predicates **read** and **write** select for object of the dotted type specified by the restriction.

2.8.7 Mapping from Qualia

Pustejovsky examines the consequences of qualia-based representations for how arguments are mapped to syntax. He posits that projecting semantic arguments to syntax from underlying forms is general, and over generate unless constraints are

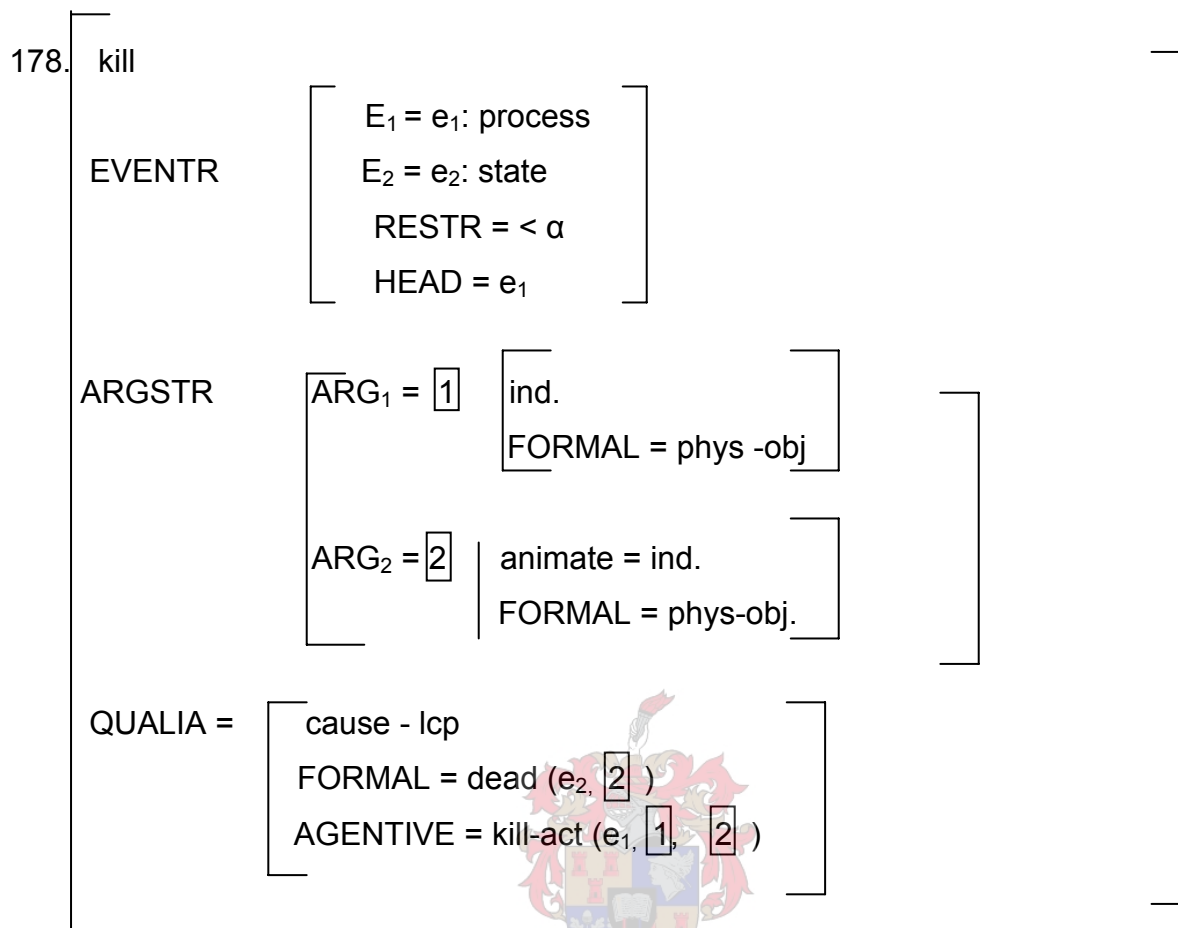
operative in the grammar which block the expression of certain predicate-argument mapping. Event-headedness acts to foreground or “focus” a single quale of the verbal semantic representation which abstracted quale that results from headedness abstracted at s-structure. If projection as specifying the appropriate grammatical functions to the arguments of a lexical item.

177. $V(\underline{x},y) \rightarrow X: \text{SUBJ}, Y: \text{OBJ}$

According to Pustejovsky the task for a qualia-based representation is clear, namely to project from multiple semantic expressions to the appropriate grammatical functions in syntax. The Predicate Argument Structure (PAS) strategy accounts for how (176) and (177) above is realised in syntax, projection in the Generative Lexicon must make reference to qualia potentially complicating the lexicon to syntax mapping.

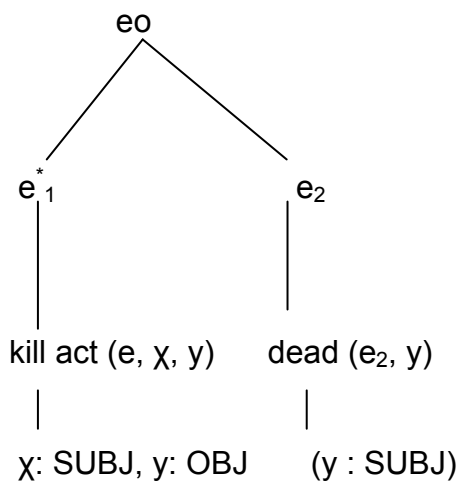
According to Pustejovsky the presence of more than one qualia role, individual qualia compete for projection and mechanism such as headedness act as a filter to constrain the set of projectable qualia. He further states that the headed event e^* projects the configuration (or template) associated with that event’s predicate (i.e. its quale value). There are two possible mapping in the qualia above.

The demonstration of the principle of the lexical representation for the verb kills.



Pustejovsky suggests that headedness determines that the argument associated with the second sub-event, e_2 , cannot be expressed since the qualia for the headed event express the template associated with that relation

179.



For an unergative verb such as run, the projection to subject follows from the qualia structure e.g.

$$180. \left[\begin{array}{l} \text{run} \\ \text{EVENTSTR} = \left[E_1 = e_1: \text{process} \right] \\ \text{QUALIA} = \left[\text{AGENTIVE} = \text{run-act} (e_1 \chi) \right] \end{array} \right]$$

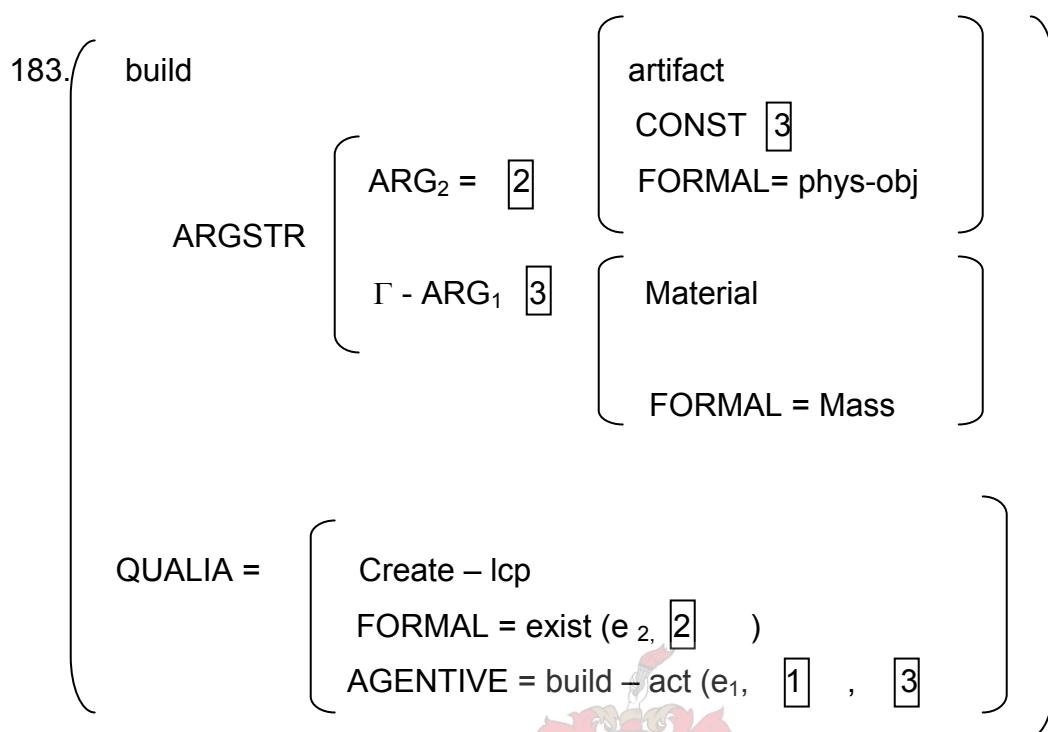
In addition to mapping the qualia of a lexical expression must be “saturated” by the syntax. The variable in the qualia structure must be fully interpreted in the resulting syntactic structure e.g.

181. QUALIA SATURATION: A qualia structure is saturated only if all arguments in the qualia are covered.

182. COVERING an argument X is covered only if:

- (i) X is linked to a position in s-structure; or
- (ii) X is logically dependent on a covered argument Y, α
- (iii) X is existentially closed by virtue of its type.

Pustejovsky points out that the verb **build** is referred constitutive causative, and additional constraint is at play, because there is a default argument in the semantics of build (the material \geq used by X to bring about y), the binding is different than for a default causative relation, such as the abbreviated qualia structure.



The initial event is headed, except the default argument, namely: the material to surface as the direct object, but is not the case. Pustejovsky maintains that such a default argument can be viewed, as a skolem function of the argument is dependent on viz.: $f(y)$. The calculus of relations in the qualia and the template associated with them, the FORMAL argument in this case ends up bound to the object position in syntax.

Pustejovsky points out that a lexically left-headed events such as **kill** has the effect of shadowing the agent, and allowing expression of this argument only by adjunction. unergative and unaccusative verbs are distinguished by their qualia structure, but Unergative are not homogeneous class by any means. He maintains that agents like process **run** is associated with the AGENTIVE quale while processes sleep are lexically associated with the FORMAL role. It determines the manner in which adjuncts may co-compose with the verb to derive non-lexical senses such as **run to the store** vs. **sleep a restful sleep**.

2.9 GENERATIVE MECHANISMS IN SEMANTICS

According to Pustejovsky the machinery is necessary in order to make use of the representations presented i.e. event structure qualia structure and an argument structure with dotted types, so that the criteria of descriptive and explanatory adequacy can be satisfied for semantic theory. He posits that the mechanism responsible for polymorphic behaviour of language is a set of generative devices connecting the different levels of lexical semantics, providing for the compositional interpretation of words in context.

Pustojovsky argues the generative operations are the semantic transformations of **type coercion selective binding and co-composition**. Co-compositional operations are transformations making use of semantically under specified forms, as manner co-composition, feature transcription and light verb specification. Pustojovsky asserts that the isomorphism between syntactic and semantic categories cannot be maintained for all levels of linguistic description or desirable. A syntactic phrase cannot be interpreted outside of the syntactic and semantic context within which it appears. Pustojovsky views the role played by type shifting and of type coercion elaborated by the mechanism of coercion and the use of the richer semantic representations presented to explain polysemy phenomenon.

2.9.1 Coercion and Type Structure.

Pustojovsky argues that type shifting is a way of allowing operations such as negation and conjunction to change type according to what they modified or took as arguments. The types for an expression are related a **type ladder**. The utility proposal allows a compositional semantics also accounting for the different manifestations of an expression in a principled way.

2.9.2 Parametric Polymorphism and Type Shifting.

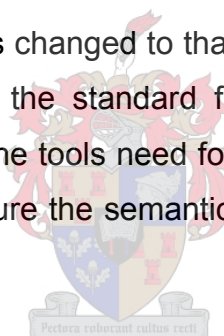
According to Pustojovsky the type-shifting phenomenon in natural language is related to **parametric polymorphism**. Lexical items are said to be parametric polymorphic for example, an individual, **John** of type e is coordinated with a quantified.

184. **John** and **every woman** arrived.

Type shifting is useful for bringing together two distinct approaches to the semantic of interrogatives. According to Pustojovsky type shifting is illustrated in this way:

185. John considers Mary **a fool**.

In (185) the type of the NP **a fool** is changed to that of a predicate, $\langle e, t \rangle$. Mary (of type e) and predicate can combine in the standard fashion. Pustojovsky states that the selection of type shifting provides the tools need for expressing the semantics-to-syntax mapping in the grammar, can capture the semantic relatedness between systematically ambiguous lexical items.



186. (a) John believes **that Mary is honest**.

(b) John believes **Mary to be honest**.

187. (a) Mary prefers to program in common lisp.

(b) Mary prefers **for her students to program in common lisp**.

Pustojovsky argues that the type-shifting operator performs a destructive operation which the meaning postulate essentially acts to correct. A particular grammatical usage of a verb is recorded in a separate lexical entry which characterized as sense enumeration. The relatedness between words is captured via meaning postulates, and there is no single, “deep” type shifting of a phrase is often “licensed” by a particular

lexical item. The governing verb considers the licensed shift in the second NP to be interpreted as a predicate. In order to reduce the amount of lexical ambiguity that grammar requires there are several constructions that have been treated ambiguous verbs but lend themselves to a type-shifting explanation:

188. (a) John wants to **have a car** until next week.
 (b) John wants **a car** until next week.

Pustejovsky maintains that the hidden adverbial until next week modifies a hidden or understood predicate in (188b) as it modifies the overt predicate in (188a).

Pustojovsky refers to the limitation with Montague Grammar, where the information from the complement can in no way contribute to the overall composition of the phrase. The problems encountered with contextualization of senses for verbs such as **enjoy**, **begin**, **finish**, namely the sense enumeration necessary to account for the behaviour of verbs are systematically associated with the complements as they are with constraints from the verb. The other way establishes the relation between verb senses is by meaning postulates. The meaning postulates solution for relating the different senses of solution for relating the different senses of want seems arbitrary powerful and unconstrained.

Pustejovsky asserts that Type shifting does allow various complement structures to be accepted by the same verb, what the operations are doing to create new sub categorization frames or semantic categories for each different complement types. There are two major problems with this approach. First, Pustejovsky notes, in most cases it is the meaning postulate and not with any more restricted mechanism. The second problem is that it fails to capture the polysemous behaviour of the complements when they appear in other syntactic environments. The natures of the complements as **beer** and **book** exhibit systematic polysemies that are independent of the verb **want**.

189. (a) Mary wants John to leave (S[+inf]
 (b) Mary wants to leave. (VP[+inf]

(c) Mary wants a beer (NP)

Pustejovsky points out that in type-shifting the verb accommodates a syntactic environment, the type of the verb remains the same; it is monomorphic with respect to semantic selection. The syntactic type of the complement to the verb which undergoes a type-shifting operation by virtue of lexical governance from the verb. This type of operation is called type coercion, because it is lexically governed type-shifting.

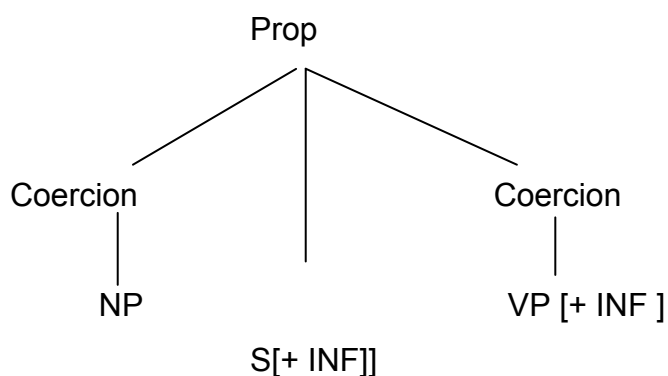
Pustojovsky defines coercion as follows:

190. TYPE COERCION: a semantic operation that converts an argument to the type, which is expected by function, where it would otherwise result in a type error.

Pustojovsky extends the proposal and suggests that each expression of α may have available to it, a set of shifting operators, which is called $\Sigma \alpha$, which may operate over an expression, changing its type and denotation. He explains that the rules of function application and composition may make reference to these operators directly, allowing treating the function as behaving polymorphically, while the argument is actually the shifting type. Hence an initial formulation of the rule of function application incorporates type coercion.

Pustojovsky argues that there are two things to explain: first, the different syntactic environments that are available as the complement types to the verb want and secondly, the different interpretations that arise for the NP complement examples which seem to require an enumeration of sense along with pragmatic enrichment for the cases. Proposing different semantic type for the verb i.e. separate and distinct lexical entries entails that verb's type remained constraint where the internal argument is uniformly typed as a proposition. If the syntactic form in complement position matches the type, the resulting structure is well-formed. Pustejovsky explains the appropriate type is not present in complement position; it is coerced by the verb to match the type required by the typing restrictions on the verb. The tree diagram illustrates the relation between the "deep semantic type" and the syntactic realizations.

191.



Pustejovsky observes that from the perspective of syntactic categories, a syntactic expression does not denote a single semantic type. It assumes a particular semantic type virtue of context. He suggests that the syntactic forms associated with the argument of *want*, which appear to be a prepositional type of some sort, are not uniquely realizable as three syntactic forms for *want*, but are expressible by virtue of semantic type itself. The methodology is fairly classic one in generative linguistics, arguing for the properties of an expression on the basis of its distributional behaviour.

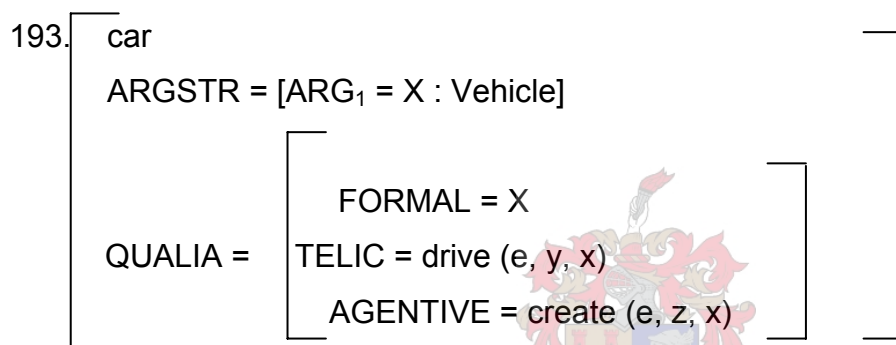
Pustejovsky formalizes the operation of type coercion and shows how it is an integral component to the grammar. The semantic system that allows to capture the semantic creativity and sense extension phenomena, with a richer representation system as embodied in the level of argument event, and qualia structure, can coerce appropriately apply to give rise to creative senses.

2.9.3 Sub-type Coercion.

According to Pustejovsky the formal properties of type coercion the simplest case of coercion involving a specific kind of semantic shifting, namely the case of sub-type coercion is required. The formal properties accompanying types and sub-types are known in the semantics and knowledge representation literature. The subject and object NP are sub-type of the sortal specifications to the argument of the verb, e.g.

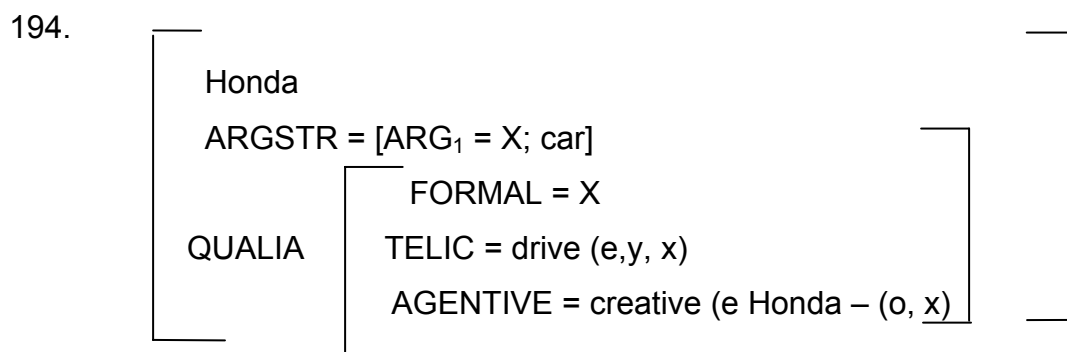
192. (a) Mary drives **a Honda** to work.
 (b) **Tom** reads the **Tractatus** on holiday.

Pustejovsky examines from the viewpoint of syntax, for semantics with types to establish a relation between the type denoted by the NP in argument positions and the type that is formally selected for by the **verbs** drives and **read**. He explains that the conventional relation given between types is one of sub-typing. Hence, within typing system, we need to ensure that if a function select for type T_1 ($T_2 \leq T_1$) it too should be accepted by the function as a legitimate argument:

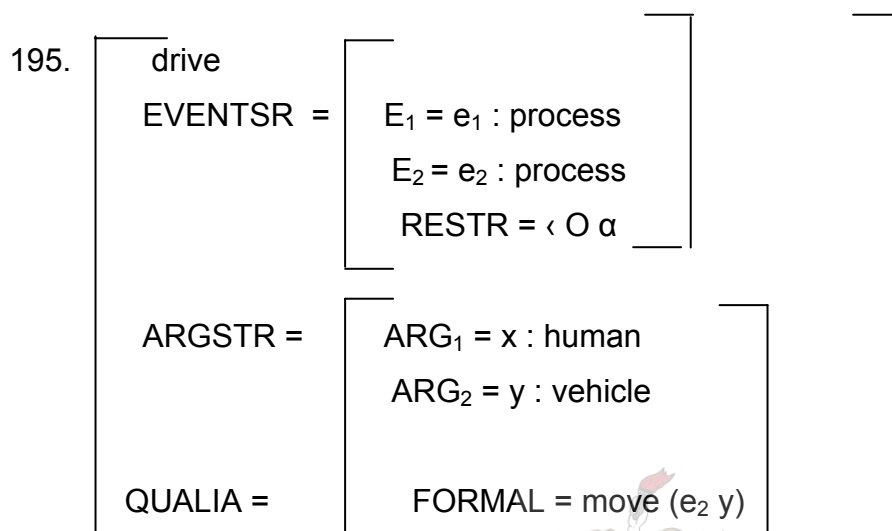


In the above example, the noun **car** is the lexical representation by typing Honda as a sub-type of a car to establish a relation between $\text{Honda} \leq \text{car} \leq \text{vehicles}$.

Pustejovsky asserts that the AGENTIVE role supersedes the more general value associated with an artifact in car, qualia. AGENTIVE and TELIC values are both inherited, the types specified of the AGENTIVE for Honda is defined as follows:



Pustejovsky states that the internal type selected by the verb **drive** is vehicle, the lexical for drive the selectional requirements can be satisfied in sub-typing relations which acts to formally relate the type of the actual object to the lexically specified type, represented as follows:



According to Pustejovsky, an expression α of type σ_1 , which is a sub-type of σ_2 there is a coercion between σ_1 and σ_2 , which changes the type α in this composition, from σ_1 to σ_2 . The typing relation between the sub-type Honda and the type selected by governing verb drive is respected by the coercion relation θ e.g.

196. (a) $\theta [\text{Honda} \leq \text{car}] : \text{Honda} \longrightarrow \text{car}$
 (b) $\theta [\text{car} \leq \text{vehicle}] : \text{car} \longrightarrow \text{vehicle}$

The Tractatus \leq book \leq text defines a relation between the type selected by the verb read and the actual individual. The general mechanism of type coercion with the sub-typing relation returns to complement coercion cases.

Pustejovsky points out that the sub-typing polymorphism and the complement coercion are similar in that they permit the variable function of a lexical item to be expressed in a single form, they are formally quite different. Sub-type coercion follows the inferences available in a single type lattice, true complement coercion requires reference to multiple types lattices making use of information available through the qualia.

2.9.4 True Complement Coercion

According to Pustejovsky polymorphism, true type coercion, involves the strict shifting of a type to another specified type, licensed by lexical governance. The shift is not arbitrary, but embeds the existing type into the resulting type by the proper coercion operation.

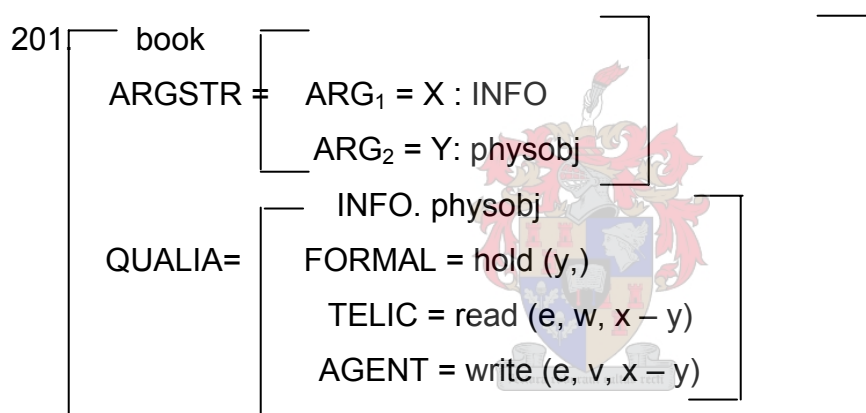
197. (a) Mary wants **a beer**.
 (b) Mary wants **a cigarette**.
198. (a) Mary enjoyed **the movie**.
 (b) Mary enjoyed **watching the movie**.
199. (a) John began **a book**
 (b) John began **reading a book**.
 (c) John began **to read a book**.

Pustejovsky states that to capture the semantic relatedness of different verb forms, need to involve a coercion rule to ensure that the semantic type of the verb is satisfied regardless of syntactic form.” The rule of function application with coercion (FAC) given describes how the semantic transformation comes about. A lexical structure associated with the verb **begin** given below show an incomplete form, for the typing on the second argument is explicitly given as an event

$$202. \left(\begin{array}{l} \text{begin} \\ \text{EVENTSTR} = \\ \\ \text{ARGSTR} = \\ \\ \text{QUALIA} = \end{array} \right. \left. \begin{array}{l} \left[\begin{array}{l} E_1 = \text{transition} \\ E_2 = \text{transition} \\ \text{RESTR} = < \alpha \end{array} \right] \\ \\ \left[\begin{array}{l} \text{ARG}_1 = X : \text{human} \\ \text{ARG}_2 = e_2 \end{array} \right] \\ \\ \left[\begin{array}{l} \text{FORMAL} = P(e_2, X) \\ \text{AGENTIVE} = \text{begin-act}(e_1, x, e_2) \end{array} \right] \end{array} \right)$$

Pustejovsky explains that the complement to **begin** is actually an event of some sort. Regardless of the surface syntactic form of the complement, the semantic typing environment is the same viz: an event. The coercion is successful only if the NP has available to it as **alias** of the appropriate type.

According to Pustejovsky an alias can be thought of as an alternative type that is available to an element, be it lexical or phrasal. In (199a) the event type is forced on the complement a book and comes about by reconstructing an event reading from the qualia of a NP. The lexical structure for book is a dot object, making reference to two types **info** and **physobj** 12



Pustejovsky argues that the NP **a book** does not satisfy the type required by the predicate **begin**, the verb coerces the NP into an event denotation, which is available from the NP's qualia structure through projection. There are two event readings associated with NP, namely the value of the ADJECTIVE and TELIC qualia roles.

Pustejovsky states that an event is actually reconstructed to satisfy the typing environment is a result of the coercion operation. The tree representation below where semantic types are notated in brackets. According to the lexical structure in (201) above, the verb **begin** has two arguments, [human] and [event] can be viewed as occupying a minimal syntactic projection for the verb, independent of any particular syntactic expression. Pustejovsky states that the statement of coercion on the complement from

the governing verb, **begin** can be seen as requiring it to recover an event-denoting expression embedded on the NP semantics within this expression. He posits that the semantic typing of an environment can be respected without changing the syntax of the expression. The expression coerced projects the appropriate semantic type required by the application rule. Pustejovsky maintains that interpretations are formally derived by the complement variations possible with the propositional attitude verb **believe**, as shown in the following examples:

202. (a) Mary believes that he left (S [+ TNS])
 (b) Mary believes him to have left (S [+ INF])
 (c) Mary believes the book (NP)
 (d) Mary believes John (NP)

The verb believes selects for a propositional type, as its complement, the tensed sentential complement in (202a) can be viewed as direct satisfaction of selected type.

According to Pustejovsky, the interpretation of the complement in (202c) is a definite NP as the book is formally a generalized quantifier, with type $\langle\langle e, t \rangle, t \rangle$ the interpretation it assumes in this position is that of a proposition. In (202) above, Pustejovsky maintains that there are at least two possible events, interpretations associated with a noun **book** (subsequently with the NP containing it) but there is neither an event reading for (202c) nor is there a “reconstructed proposition” from the qualia structure in the semantics of the book is more complex than assumed for nominal term phrase, namely, the noun book is a complex (or dot) object, and its type info-physobj.

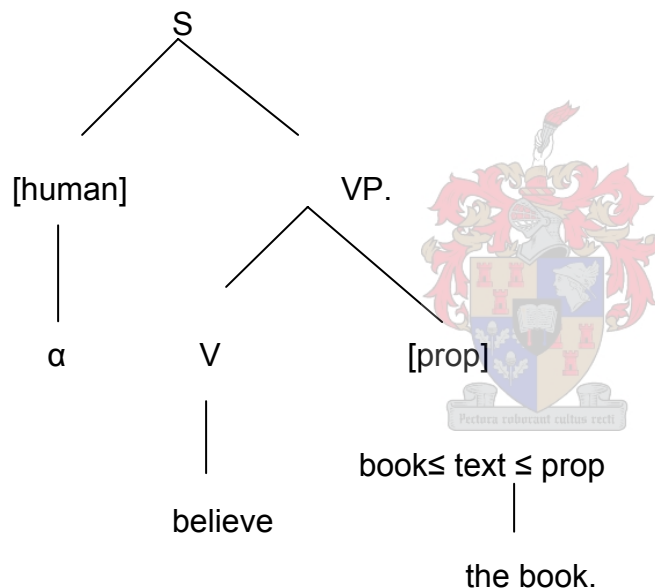
203. $\alpha = \text{info } \alpha : \text{physobj}$
 $1cp(\alpha): \text{info. physobj}$

Pustejovsky argues that the dot object is the logical pairing of the senses denoted by the individual types in the complex type. The relational nominal assumes that nominal such as **book** is a sort of container that is further specified as a relation contained within it.

The complex type need to define the operations over object which effectively foreground a particular sense. Pustejovsky asserts that the coercion operations projecting one from the complex type are a special case of projection and can be defined as Σ_1 and Σ_2 . Pustejovsky points out that the two operations together with the dot object itself form the definition of the type cluster called lexical conceptual paradigm.

Pustejovsky states that **a book** always denotes in part, textual information, because of the sub-typing relations between these two types and the type proposition (prop): $\text{book} \leq \text{text} \leq \text{prop}$. The NP the book is able to “stand in” for a full propositional expression, as shown by the following tree structure.

204.



Pustejovsky asserts that the deep typing on the complement is satisfied by enriching the semantics of the object description as well as adding functionality of the manner in which phrases compose. The typing requirement for a verb sell selects for a complement of type ind, is satisfied by the lexical conceptual paradigm of **book**:

205. a. Mary sold the book to John.
 b. Sell (John) θ (Σ_2 (the book))) (Mary) \rightarrow
 c. Sell (John) θ (the book: physobj) (Mary) \rightarrow

- d. Sell (John) (the book): ind (Mary)

The type physobj is available by application of the coercion operator Σ_2 and the type ind is available through sub-typing with the coercion operator θ : i.e. $\text{physobj} \leq \text{ind}$

206. Mary believes John (NP).

2.9.5 Co-composition.

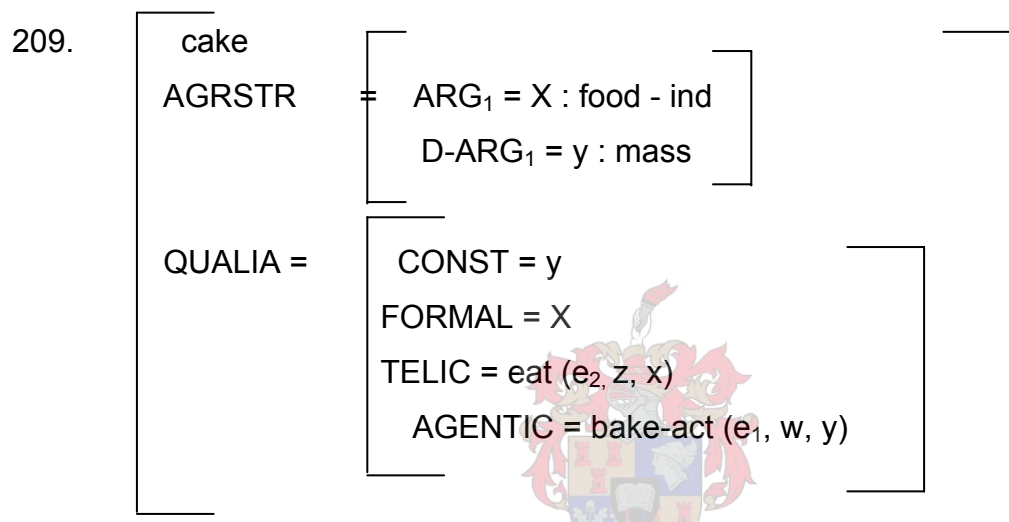
According to Pustejovsky, verbal polysemy involves co-composition. He states that co-composition describes a structure which allows superficially more than of function application e.g. the verb baking is a polysemy and has two meanings, namely: a change of state and that of creation sense.

207. (a) John **baked** the potato
(b) John **baked** the cake.

To capture the logical polysemy and obviate the need for multiple listings of words. Pustejovsky proposes that the complements carry information which acts on the governing verb essentially taking the verb as argument and shifting its event type, e.g. the lexical structure for a verb **bake**.

208. $\left(\begin{array}{l} \text{bake} \\ \text{EVENSTR} = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ \text{HEAD} = e_1 \end{array} \right] \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 = \boxed{1} \text{ animate - ind.} \\ \text{FORMAL- physobj} \\ \text{ARG}_2 = \boxed{2} \text{ MASS} \\ \text{FORMAL} = \text{physobj} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{State - change - lcp} \\ \text{AGENTIVE} = \text{bake - act} (e_1 \boxed{1} \boxed{2}) \end{array} \right] \end{array} \right)$

Pustejovsky argues that it is only one sense for **bake** and that any other readings are derived through generative mechanism in composition with its arguments. What needs to be explained is why nouns such as cake, bread and cookie “shift” the meaning of the verb bake while other nouns such as potato and garlic do not. To capture the fact that the former objects are prototypically brought by the activity they are in composition with something that the qualia structure should be able to express. The qualia for cake make reference to an AGENTIVE value of $\lambda y \lambda \chi [\text{bake} (e, y \chi)]$



Pustejovsky states that the AGENTIVE makes reference to the very process with in which it is embedded in this phrase in the relation called co specification.

According to Pustejovsky the semantics for the VP **bake a cake** results from several operations. The conventional function application binds the object into the argument structure of the verb bake. Pustejovsky posits that a type of feature unification occurs, licensed by the identity of qualia values for AGENTIVE in the verb and its argument. The operation of co-composition results in a qualia structure for the VP that reflects aspects of both constituents:

- A) The governing verb bake applies to its complement.
- B) The complement co-specifies the verb.

- C) The composition of qualia structure result in a derived sense of the verb, where the verbal and complement AGENTIVE roles match and the complement FORMAL quale become the FORMAL role for the entire VP.

Pustejovsky refers to the operation, of **qualia** unification. Word senses of verbs like **bake** by putting some of the semantic weight on the NP suggests that the verb itself is not polysemous. He asserts that the creation sense of **bake is** contributed in part by the meaning of **a cake**, by virtue of it being an artifact. The verb appears polysemous because certain complements (i.e. those co-specifying the verb) add to the basic meaning by co-composition.

$$\begin{array}{l}
 210. \left(\begin{array}{l}
 \text{bake a cake} \\
 \text{EVENTSTR} = \left[\begin{array}{l}
 E_1 = e_1 : \text{process} \\
 E_2 = e_2 : \text{state} \\
 \text{RESTR} = < \infty \\
 \text{HEAD} = e_1
 \end{array} \right] \\
 \\
 \text{ARGSTR} = \left[\begin{array}{l}
 \text{ARG}_1 = \boxed{1} \left[\begin{array}{l}
 \text{animate -ind} \\
 \text{FORMAL} = \text{physobj}
 \end{array} \right] \\
 \\
 \text{ARG}_2 = \boxed{2} \left[\begin{array}{l}
 \text{artifact} \\
 \text{CONS} = 3 \\
 \text{FORMAL} = \text{physobj}
 \end{array} \right] \\
 \\
 \text{D-ARG}_1 = \boxed{3} \left[\begin{array}{l}
 \text{material} \\
 \text{FORMAL} - \text{mass}
 \end{array} \right]
 \end{array} \right] \\
 \\
 \text{QUALIA} = \left[\begin{array}{l}
 \text{create - lcp} \\
 \text{FORMAL} = \text{exist} (e_2, \boxed{2}) \\
 \text{AGENTIVE} = \text{bake -act} (e_1, \boxed{1}, \boxed{3})
 \end{array} \right]
 \end{array} \right)
 \end{array}$$

The result of co-composition is a semantic representation at the VP level that is identical in structure to the lexical form for a creation verb such as **build**. The creation sense of **bake** embeds the change of state reading within it by systematic rules of composition? The sense arises not by lexical enumeration, but generatively in the semantic itself. Pustejovsky suggests that directional PPs act as functions over the verb to give rise to a derivative verb sense through co-composition e.g.

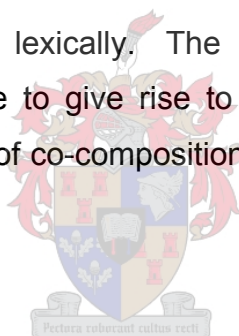
$$\begin{array}{l}
 211. \left(\begin{array}{l} \text{into the cave} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 = \boxed{1} \text{ [physobj]} \\ \text{ARG}_2 = \boxed{2} \text{ [the cave]} \end{array} \right] \\ \\ \text{EVENTSTR} = \left[\begin{array}{l} E_1 = e_1 : \text{process} \\ E_2 = e_2 : \text{state} \\ \text{RESTR} = < \infty \\ \text{HEAD} = e_2 \end{array} \right] \\ \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = \text{act} (e_2, \boxed{1}, \boxed{2}) \\ \text{AGENTIVE} = \text{move} (e_1, \boxed{1}) \end{array} \right] \end{array} \right)
 \end{array}$$

Pustejovsky posits that the PP carries the motion sense as part of its qualia structure, in composition with the verb float, the interpretation of the VP is roughly equivalent to where the matrix predicate is temporally and functionally subordinated to the application of the PP.

$$212. \lambda \chi \lambda e_1 e_2 [o e_1, e_2) \wedge \text{float} (e_2, \chi)] \text{ while floating.}$$

$$\begin{array}{l}
 213. \left(\begin{array}{l}
 \text{float into the cave} \\
 \text{ARFSTR} = \left[\begin{array}{l}
 \text{ARG}_1 = \boxed{1} \quad [\text{phys obj}] \\
 \text{ARG}_2 = \boxed{2} \quad [\text{the - cave}]
 \end{array} \right] \\
 \\
 \text{EVENTSTR} = \left[\begin{array}{l}
 E_1 = e_1 : \text{state} \\
 E_2 = e_2 : \text{process} \\
 E_3 = e_3 : \text{state} \\
 \text{RESTR} = \langle \alpha (e_2, e_3) \circ \alpha (e_1, e_2) \rangle
 \end{array} \right] \\
 \\
 \text{QUALIA} = \left[\begin{array}{l}
 \text{FORMAL} = \\
 \text{AGENTIVE} = \left[\begin{array}{l}
 \text{move } e_2, \boxed{1}, \text{float } (e_1 \boxed{1})
 \end{array} \right]
 \end{array} \right]
 \end{array} \right)
 \end{array}$$

Pustejovsky states that this analysis shows that the conflated sense for the verb float exists only phrasally and not lexically. The co-compositional operations can contextualize the underlying sense to give rise to the interpretation. There are three applications to illustrate the notion of co-composition, feature transcription and light verb specification.



2.9.6 Selective Binding.

According to Pustejovsky there are three types of polysemy with adjectival modification, as illustrated below:

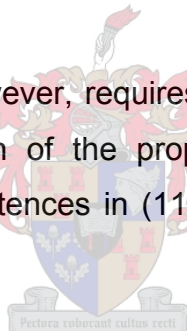
214. (a) We will need a **fast** boat to get back in time.
 (b) John is a **fast** typist.
 (c) **Fast** drivers will be caught and ticketed.
215. (a) John put on a **long** album during dinner.
 (b) I'll like a really **bright** bulb for my desk.
 (c) Mary dumped the pasta into the **boiling** pot.
216. (a) The man is **sad**
 (b) John is a **sad** man.

- (c) That was truly a **sad** day (event, occasional)

Pustejovsky maintains that the standard view of selection within an SEL for these types of adjectives is to enumerate the senses. Every finely-nuanced sense of fast must be typed specifically for the noun class or type it modifies. The meaning of fast is determined largely by the semantics of the head it is in construction with. In predicative position, adjective such as fast are ambiguous as well, being able to modify both NPs in (117) below as well as (118) below.

117. (a) That was **fast!** You're back already?
 (b) Your dog is **fast**.
118. (a) Emmanuel Ax's hand moved so **fast** that during the scherzo they were a blur.
 (b) Mary was driving too **fast** to maintain control of the car.

The individual readings in (117) however, requires reference to an event. In (117a) the interpretation refers to the duration of the property of being fast when moving is predicated of the **dog**. The two sentences in (118) are both standard event predictive interpretations.



According to Pustejovsky, adjectives such as **fast** are polysynonymous, being able to modify individuals or event in context depends on the semantic of the head itself. Treating the adjective of the head itself. Treating the adjective **fast** as simply and an intersective modifier would give $\lambda X [\text{typist}(x) \text{ fast}(x)]$. The interpretation of John is a typist who is fast at typing is in the qualia structure for a deverbal agentive nominal such as typist.


119.
$$\left(\begin{array}{l} \text{typist} \\ \text{ARGSTR} = \left[\text{ARG}_1 = X: \text{human} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = X \\ \text{TELIC} = \text{type}(e, \chi) \end{array} \right] \end{array} \right)$$

If fast is an event predicate, then there is no standard mode of composition that would allow the desired interpretation.

220. $\lambda \chi [\dots \text{telic} = \lambda e [\text{typ}'e (e, \chi) \wedge \text{fast} (e)] \dots]$

Pustejovsky asserts that the adjective is able to make a selection interpretation of an event expression contained in the qualia for the head noun. What makes such an event interpretation possible is a generative mechanism referred to as **selective binding**.

221. SELECTIVE BINDING: Pustejovsky argues that if α is of type $\langle a, \rangle\beta$ is of type b , and the qualia structure of β , $Qs\beta$, has quale, q of type a , then $\alpha \beta$ is of type b , where $[[\alpha \beta = \beta \text{ n } \alpha(q\beta)]$. The semantic device giving the adjective as a function and applying it to a particular quale within the N' that it is in composition with. The same interpretive mechanism allows accounting for the contextualized senses for evaluative adjectives, such as **good** e.g. **a good** knife: a knife that cuts well.

222. 
$$\left[\begin{array}{l} \text{KNIFE} \\ \text{ARGSTR} = \left[\text{ARG}_1 = X: \text{tool} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{FORMAL} = X \\ \text{TELIC} = \text{cut} (e, \chi, y) \end{array} \right] \end{array} \right]$$

Pustejovsky maintains that **good** functions as an event predicate, it selectively modifies the event description in the TELIC quale of the noun. The selective modification within the NP is illustrated as follows:

223. (a) John bought a **long** record.
 (b) a **long**: a record whose playing time is long.

The qualia structure for **record** is given below and the adjective **long** has an interpretation as an event predicate, it is a selective interpretation over the TELIC event of “the record playing.”

$$224. \left(\begin{array}{l} \text{record} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG}_1 = X : \text{phys obj} \\ \text{ARG}_2 = Y : \text{info} \end{array} \right] \\ \\ \text{QUALIA} = \left[\begin{array}{l} \text{INFO. Phys obj} - 1\text{cp} \\ \text{FORMAL} = R(X.Y) \\ \text{TELIC} = \text{Ray}(e, \chi, y) \end{array} \right] \end{array} \right)$$

2.9.7 Semantic Selection

According to Pustejovsky there are two ways in which a generative lexicon can affect the mapping from lexical semantics to syntax.

- A. There is no one-to-one mapping from underlying semantic types to syntactic representations rather; a syntactic phrase is only fully interpretable within the specific semantic context within which is embedded.
- B. Because the representation of semantic information in the qualia structure, argument structure and extended event structure is richer than what conventional models associate with a word a more complex model of filtering and checking is necessary for restricting the output to actual syntactic form.

2.9.8 Canonical syntactic forms

Pustejovsky argues that the semantic type associated with an argument for a verb allows for a multiplicity of syntactic expressions. The grammar associates a canonical syntactic form with a semantic type but there are many possible realizations for a type due to the different possibilities available from the generative devices such as coercion

and co-composition. The lexical conceptual paradigm (lcp) can be seen as the lexicalization of a number of distinct semantic types into one lexical form.

The noun **newspaper** is logically polysemous between the organization and the printed information-containing object while the noun **author** makes reference to the “producer” of the book. According to Pustejovsky the semantics of a lexical item is able to determine the resulting syntactic form possible for complements to that item. To examine the selectional distinctions between the minimal pairs requires:

- (a) the verbs **like** and **enjoy**
- (b) the interrogative selecting verbs **ask** and **wonder**.

Pustejovsky states that the semantic selection can in fact be a good indicator of the syntactic behaviour of a lexical item, when viewed together with the generative operations that connect the distinct syntactic form for a particular semantic type. For any semantic, there is a unique canonical syntactic form (csf) that expresses the type as a syntactic object, X^i . Expressed as function, csf can be viewed as unique mapping from semantic types to syntactic forms, $csf:T \rightarrow X^i$ such that:

For every type T in the set of semantic types, there is a function, canonical syntactic form (csf) such that $csf(T)=X^1$ except for

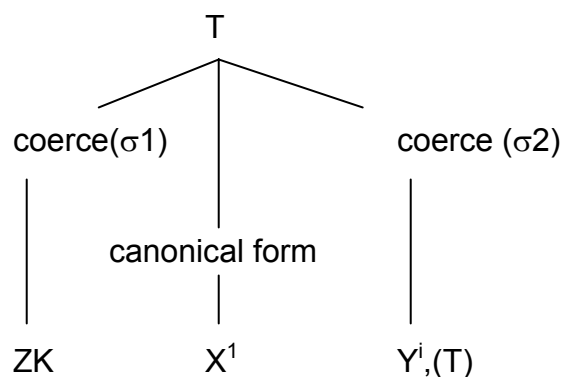
when $T = \perp$ or

when $T = \perp$

in which case csf is undefined.

According to Pustejovsky a syntactic expression, Y^i , of type σ (where $csf(\sigma)=y^i$) is substitutable for the csf of a type T only, this type is fully recoverable from licensed semantic operations on σ . A verb is typed for selecting an argument of type T , where $csf(T)=X^1$. The direct realization of this type as X^1 is well-formed, assuming, surface constraints are satisfied in the syntax; that is $[V X^1 \dots]$ is a legitimate structure.

The verb appearing together with a syntactic phrase Y^i , of type σ_2 , i.e., $[VY^i \dots]$. The structure is well-formed only if T is fully recoverable from σ_2 e.g.



According to Pustejovsky the resulting set of syntactic forms associated with a particular semantic type will be called a **phrasal paradigm**. The operations ensuring recoverability on the semantic type are exactly the generative devices, namely coercion, selective binding, and co-composition. He considers the classic subcategorization differences between the verbs **enjoy** and **like** and their complement selection behaviour.

- a) Mary **likes** to watch movies
- b) Mary **likes** watching movies
- c) Mary **likes** movies
- d) Mary **likes** (for) John to watch movies with her
- e) Mary **like** that John watches movies with her
- f) Mary **likes** it that John watches movies with her

- *(a) Mary **enjoys** watches movies
- (b) Mary **enjoys** movies

Pustejovsky points out that the syntactic differences between the other verbs are typically used as counter examples to strong views of the semantic selection hypotheses. Pustejovsky maintains that the NP complementation pattern for verbs like **ask** illustrate two aspects of the approach.

- A. the ability of the verb to coerce its complement
- B. the ability of the complement to metonymically reconstruct the required coercing type from the semantic structure within the complement. The mechanisms behind

these shifts in other classes. He considers the range of complementation patterns is for a small number of verbs where phrasal paradigm associated with each verb distinct semantic type:

LIKE-class (like, hate, prefer)

- (a) John would **hate** Bill to leave
- (b) John **hated** (it) that Bill left
- (c) John **hated** to loose the game.
- (d) John **hated** losing the game.
- (e) John **hated** that he lost the game

WAGER-Class (wager, bet)

- *(a) John **wagered** Bill to have left.
- (b) John **wagered** that Bill left.
- (c)* John **wagered** to have left



MAINTAIN-class

- (a)* John **maintained** Bill to have left
- (b) John **maintained** (for a year) that Bill left.
- (c) John **maintained** to have left.

TRY-class (try, attempt)

- (a)* John **tried** Bill to read the book
- (b) John **tried** that Bill read the book
- (c) John **tried** to read the book
- (d) John **tried** the book

REMEMBER-class (remember, forget)

- (a) John **remembered** to lock the door
- (b) John **remembered** that he locked the door
- (c) John **remembered** locking the door

- (d) John **remembered** where he puts the keys
- (e) John **remembered** his phone number

PERSUADE-class (Persuade, convince)

- (a) John **convinced** Mary to build a house
- (b) John **convinced** Mary that she should build a house
- (c) John **convinced** Mary that she had built a house

Pustejovsky argues that the broader the selectional possibilities for verb, the more general is the semantic type associated with the complement. The verb like selects the type T, for which there is no specific cononical syntactic form (csf) but associated with the csfs for its immediate subtypes hence indirectly behaves as though it has several csfs along with the derived syntactic expressions within the phrasal paradigm for each type. The verbs **forget** and **remember** select very generally for a factive interpretation of any type.

According to Pustejovsky the semantic type which results is a dot object and the lexical conceptual paradigm itself is the type cluster of the individual types together with the dot object. The syntactic realizations for a semantic type are in part determined by virtue of the semantic type. Pustejovsky asserts that the form will exhibit the behavior of each type it is composed of in addition to the unique behavior of the dot object. The phrasal alternations associated with a semantic type are similar in nature to an 1cp, in that they are determined by virtue for the semantic type. Pustejovsky posits that the mapping from a single semantic type to syntactic form is a one-to-many relation. What determines this mapping is the manner in which the generative devices are allowed to transform one semantic type into another, under a set of specified constraints.

2.10 SUMMARY

This chapter showed that scholars view polysemy in different ways. Polysemy is concerned with ambiguities in the meaning of words. This was seen in an interaction of

word meaning and compositional of the words as they relate. Pustejovsky examined sets of word sense, when an individual lexical items are combined with phrases and clauses the polysemous appearances of word as far as verbs are demonstrated. Meaning cannot be separated from the structure that the word carries. Pustejovsky's view was discussed that the meaning of words must reflect the deeper conceptual structures in the cognitive system and the domain they operate in. This chapter has discussed verb Argument alternations based on its unique classes of transitive and intransitive and the lexical sense related by the interpretive features of causation. A view was given of Pustejovsky's syntactic diagnostics that has some theoretical utility is polyadicity, which is more narrowly construed. e.g. the indefinite NP deletion in the below sentences.

- (a) (i) The woman ate her meal quickly.
 (ii) The woman ate quickly

In the above given sentence there is an object drop to an aspectual difference between the verbs being contrasted.

Discussion was also given to the nominal alternations, where the well-documented count nouns and mass nouns selected for different quantifier types and allow different patterns of predication e.g.

Mass: sand, more water

Count nouns: Several houses, every child

There are nouns that have both interpretations:

Texans drink a **lot of beer**

More e-mail is arriving every day.

The semantic distinction related to count and mass nouns is that between individual and group nouns. Group nouns satisfy semantic plurality requirements. Adjectives can be classified by virtue of syntactically distinct behaviour including distinctions between predicative and attributive position.

- (i) The **alleged** criminal.
- (ii) This criminal is **alleged**.

The chapter discussed Generative Lexicon views on how nouns denote “**horizontal relations**” and **hierarchical relations**, e.g. **neighbor** and **brother** denote horizontal relation, and **father** and **daughter** denote hierarchical relations.

This chapter discussed Pustejovsky’s views on adjectives and verbs are structurally similar e.g. intransitive and transitive verbs and also the binary and unary predicative adjectives, which are intransitive and transitive forms.

- e.g.
- (i) It is **easy** to teach this class.
 - (ii) This class is **easy** to teach.

The Generative Lexicon views on inter-lexical relations of words, were discussed. Discussion was given to Pustejovsky’s views that many words have more than one meaning in languages. The ways in which words carry multiple meanings vary. The model of lexical meaning must be able to account for how the word refers e.g. the word bank may refer to a **building** and an institution. This chapter discussed Pustejovsky’s views that the essential arbitrary association of multiple senses is based on single word, which is a complementary polysemy and has cross-categorical ambiguity treated as a subspecies of contrastive sense.

Attention was given to complementary polysemy, which entails different type of relations between senses. The sense alteration is one of the nominal alterations that can describe logical polysemies, where the noun can have systematically related senses.

e.g. count/ mass alternations **lamb**

- (a) The **lamb** is running in the field.
- (b) John ate **lamb** for breakfast.

It was shown that complementary polysemy also occurs with adjectives, e.g. the word **good** has multiple meaning depending on what they are modifying.

- (a) A **good** car.
- (b) A **good**_meal
- (c) A **good** knife
- (d) A **good**_speaker

Once one contrastive sense has been fixed in a sentence, pragmatically constrained disambiguation facilitates the narrowing of other contrastive sense in subsequent processing.

According to Pustejovsky there are three basic arguments showing the inadequacies of Sense Enumeration Lexicons (SEs) for the semantic description of language:

1. THE CREATIVE USE OF WORDS: Words assume new senses in novel contexts.
2. THE PERMEABILITY OF WORD SENSES: Word senses are not atomic definitions but overlap and make reference to other senses of the word.
3. THE EXPRESSION OF MULTIPLE SYNTACTIC FORMS: A single word sense can have multiple syntactic realizations.

A sentence may simply be binary judgment on whether expression is truth-functional or not e.g

1. (a) Mary kicked me with her foot.
- (b) Mary kicked me with her left foot.

Attention was given to the argument against sense enumerative models illustrated the sense incompleteness problem, and the failing of SEs concerns the problem of fixed senses.

Attention was given to Pustejovsky's argument that in order to characterize the expressive power of natural languages in terms of semantic expressiveness, it is natural to think in terms of semantic systems with increasing functional power. The standard theory of lexical ambiguity can be characterized as a monomorphic language (ML) of

types. The chapter also referred to the Generative Lexical Model's requirement for a theory of computational semantics requires a generative framework for the composition of lexical meaning. The two distinct approaches in word meaning are primitive-based theories and relation based theories.

The chapter reviewed the Generative Lexicon notion of qualia structure gives the relational force of a lexical item. In some sense a generative lexicon analyzes all lexical items as relational to a certain degree, but the manners in which this property is expressed functionally differ of course from category to category as well as between semantic classes. When dealing with qualia structure one is to look into essential aspects of words meaning

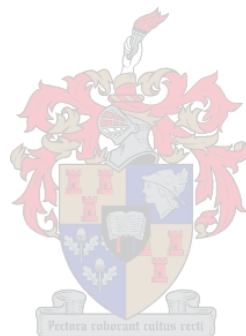
- CONSTITUTIVE
- FORMAL
- TELIC
- AGENTIVE

Generative operations as postulated by Pustejovsky are the semantic transformations **of type coercion selective binding and co-composition**. These co-compositional operations make use of semantically under specified forms, as manner, feature transcription and light verb specification. The selection of type-shifting provides the tools needed for expressing the semantics-to-syntax mapping in the grammar. The semantic relatedness between systematically ambiguous lexical items e.g.

- (a) John believes Mary to be honest.
- (b) John believes Mary is honest.

This chapter also discussed the three types of polysemy with adjectival modification and selective binding This chapter also dealt with sub type coercion which are formally properties accompanying types and subtype in the semantics and knowledge representation in literature. It also showed True Complement Coercion which involves parametric shifting of specified, licensed by lexical governance. Discussion was devoted

to **Canonical Syntactic Forms** which involve the semantic type associated with argument for a verb which allows for multiplicity of syntactic expressions. It was shown that the lexical conceptual paradigm (lcp) can be seen as lexicalization of a number of distinct semantic types into one lexical form.



CHAPTER THREE

THE POLYSEMY OF THE VERB “YA” (‘GO’) IN SEPEDI (NORTHERN SOTHO)

3.1 INTRODUCTION

In this chapter the main aim is to explore the polysemy of sentences with the verb – **ya** in Northern Sotho (Sepedi). Attention will thus focus on the verb **ya**. Employing the generative theory of the lexicon outlined in chapter two, this chapter will examine the verb **ya** and it will also explore **its** Qualia structure, and the Event structures. The chapter examines the **ya** verb in sentences prepositional phrases with the with the prepositions **ka** and **le**.

The chapter will examine the verb **ya** as a motion verb which involves polysemous instances of the movement of people, animals, objects etc. in different ways that movement is realised. In the sentences with the motion verb **ya** examined certain polysemous types of movements are realised due to conditions, circumstances and reasons. This chapter also examines sentences with **an** NP subject that denotes different semantic features, e.g. human, animals, object, feeling, in addition to the argument structure, the event structure and the qualia structure properties.

3.2 ARGUMENT STRUCTURES OF YA WITH DIFFERENT SUBJECT TYPES

3.2.1 The NP subject denotes [Human]

Consider the following example sentences:

1. a. Mosadi o ya nokeng.
(The woman is going to the river.)
- b. Mathumaša baa ya bjaleng
(Uncircumcised girls are going to girl’s circumcision.)
- c. Lesogana le ile bogweng ka rotwane.
(A young man went to the brider’s home with/by a walking stick.)

- d. Mosetsana o ya nokeng ka maoto.
(The girl is going to the river by foot.)
- e. Basadi ba ile monyanyeng ka koloï.
(The women went to the wedding by a car.)
- f. Mosadi o ya nokeng le bana ka maoto.
(The woman is going to the river with children by foot.)
- g. Mosadi o ya thabeng ka maoto le bana.
(The woman is going to the mountain by feet with children.)
- h. Ramahlale o ya mošetša ka sefofane le Mopresitente ka dithuto.
(The Scientist goes to abroad by aero plane with the President through education/studies.)

The sentence (1a) demonstrates the occurrence of a locative complement, ARG (ument) 2 with the verb **–ya** (go), which has an NP subject argument, AGR (ument) 1, bearing the thematic role of Agent. The sentence in (1b) illustrates the same structure and thematic roles. In (1c), the verb **–ya** takes a default argument, D-ARG, **ka rotwane** (with a walking stick) which is realized as a prepositional phrase with the prepositional **ka**, bearing the instrument thematic role. Similarly in (1d), the prepositional **ka** – phrase **ka maoto** (on foot) is a default argument (D-ARG), which bears an instrument thematic role and **mosetsana** is the agent argument.

In sentence (1e) similar arguments are demonstrated. The NP subject **basadi** (women) bears the agent role as AGR (ument) 1, while the prepositional **ka**-phrase, **ka koloï** is a default argument (D-ARG) bearing the instrument thematic role. The sentences (1f-h) all illustrate the occurrence of two default arguments, which are realized as a prepositional **le**-phrase, which expresses a comitative subject bearing the agent thematic role. The prepositional **ka**-phrases, **ka maoto** (on foot), and **ka sefofane** (by aeroplane) are all default arguments realizing the instrument thematic role. The subject NPs in these sentences are all agent arguments.

The lexical semantic representation of –ya in the sentences in 1 is as follows

–ya ‘go’

AGRSTR =	$\left[\begin{array}{l} \text{AGR } 1=x : \text{animate (human)} \\ \text{AGR } 2=y : \text{locative/ goal} \left\{ \begin{array}{l} \text{phys-obj} \\ \text{animate} \end{array} \right\} \\ \left[\begin{array}{l} \text{D-ARG1=p} : \text{phys-obj} \\ \text{D-ARG2=q} : \text{animate (human)} \end{array} \right] \end{array} \right]$]
EVSTR	$\left[\begin{array}{l} = \text{E1} = e_1 : \text{process} \\ \text{E2} = e_2 : \text{state} \end{array} \right]$]
QUALIA	$\left[\begin{array}{l} = \text{FORMAL} = \text{come} (e_2, y, x, (p, q)) \\ \text{AGENTIVE} = \text{come-move} (e_2, x, y, (p, q)) \end{array} \right]$]

3.2.2 The NP subject denotes [Animal]

Consider the following example sentences:

2. a. Tlou e ya moriting.
(The elephant goes to the shadow.)
- b. Phuti e ya mašemong bošego
(The springbok goes to the field at night.)
- c. Nare e ya moruleng ka kolo.
(The buffalo goes to morula tree by car.)
- d. Dipudi di ya bathong ka lori.
(The goats go to the people by lory)
- e. Ditau di ile mošetša ka sekepe.
(Lions went to abroad by ship.)
- f. Phuti e ile mašemong ka paesekela le mošemane
(The springbok went to the field by bicycle with the boy)
- g. Ditšhwene di ile mahlatsweng le dikgabo.
(Baboons went to fetch litchis together with monkeys. Or
Baboons and monkeys went to fetch litchis.)
- h. Nare e ya moruleng ka kolo le monna.
(The buffalo goes to morula tree by car with the man.)

The sentences (2a-i) demonstrate the occurrence of the locative complement, ARG (ument)₂ with the verb **ya** (go) which have an NP subject argument, ARG (ument)₁ (2a-h) bearing the thematic role of Agent. Sentence (2b) bears the same thematic roles as (2a). Sentences (2d-g) have the same structure as (2a), with the verb **ya** taking a default argument, D-ARG **ka kolo**i (by car), realised as a prepositional phrase with the preposition **ka** bearing the instrument thematic role. Sentences (2d), **ka lori** (by lorry), (2e) **ka sekepe** (by ship), (2f) **ka paesekela** (by bicycle) all contain a prepositional phrase with the preposition **ka** which realises the instrument thematic role.

The sentence (2h) demonstrates the occurrence of locative complement, ARG (ument) with the verb **ya** (go) which has the NP subject argument, ARG (ument)₁ (1h) bearing the Agent thematic role. Sentence (2h) illustrates the occurrence of the default argument realised as a prepositional **le** phrase (with) which expresses comitative subject bearing the thematic role > theme. In sentence (2h) the prepositional **ka kolo**i (by car) illustrates instrument thematic role of animate prepositional phrase. In sentence (2h) the prepositional **ka kolo**i (by car) illustrates instrument thematic role and the prepositional phrase **le dikgabo** (together with monkeys) in (2g) expresses the comitative subject bearing the agent thematic role.

The lexical semantic representation of **-ya** in the sentences 2

-ya 'go'

AGRSTR =	$\left[\begin{array}{l} \text{AGR } 1=x : \text{animate (animal)} \\ \text{AGR } 2=y : \text{locative (goal)} \end{array} \right] \left\{ \begin{array}{l} \text{phys-obj} \\ \text{animate} \end{array} \right\}$
	$\left[\begin{array}{l} \text{D-ARG1=p : phys-obj} \\ \text{D-ARG2=q : animate animal} \end{array} \right]$
EVSTR	$= \left[\begin{array}{l} \text{E1} = e_1 : \text{process} \\ \text{E2} = e_2 : \text{state} \end{array} \right]$
QUALIA	$= \left[\begin{array}{l} \text{FORMAL} = \text{come} (e_2, y, x, (p, q)) \\ \text{AGENTIVE} = \text{come-move} (e_2, x, y, (p, q)) \end{array} \right]$

3.2.3 The NP subject denotes [natural phenomena]

Consider the following sentences.

3. a. Meetse a ya bathong.
(Water goes to the people.)
- b. Mokhorō o ile setšhabeng.
(Wealth went to the community)
- c. Moriti o ile bathong.
(The shadow went to the community.)
- d. Meetse a ya motseng ka lori.
(Water goes to the community by car.)
- e. Boletla bo ya bathong ka phefo.
(Dusty itching substances go to people through/by wind.)
- f. Pula e ya bathong/lefaseng ka maru.
(Rain goes to the people/earth through cloud.)
- g. Muši o ya mafahleng ka dinko.
(Smoke goes to the lungs through/ by nostrils.)
- h. Marula a ya motseng ka lori ka masaka le basadi.
(Marula fruit go home /to the village by car, by bags with women.)
- i. Pheko e ile setšhabeng ka kgoši.
(A ritual bone went to the people through the chief.)
- j. Mahlatswa a ile gae ka lori le bana ka masaka.
(Litchis went home by car with children by bags.)

The sentences (3a-d) demonstrate the occurrence of a locative complement ARG(ument)2 with the verb **ya** (go) which has an NP subject argument, ARG(ument)1, bearing the thematic role of theme, In (3d) the verb **ya** takes a default argument, D-ARG, **ka lori** (by car), realised as a prepositional phrase with the prepositional **ka** which bears the instrument thematic role. Similarly in (3e), the prepositional **ka** phrase **ka phefo** (by wind) bears an instrument thematic role.

In sentence (3f) similar arguments are demonstrated. The NP subject argument, ARG(ument)1 bears the thematic role of Theme, ARG(ument)1. The prepositional **ka** phrase **ka maru** (through rain) is a default argument (D-ARG) bearing the instrument thematic role. The sentences (3h-j) all illustrate the occurrence of default arguments,

which are realised as prepositional **le** (with) phrase, **le basadi** (with women), **le bana** (with children) which expresses a comitative subject bearing the agent thematic role. The prepositional **ka**-phrase, **ka**-phrases, **ka lori** (by car), **ka masaka** (by bags) are all default arguments bearing the thematic role of instrument.

The lexical semantic representation of the verb ya in the sentences in 3 can be given as follows (natural phenomena)

-ya 'go'

AGRSTR =	<p>AGR 1=x : inanimate (natural phenomena)</p> <p>AGR 2=y : locative (goal) $\left. \begin{array}{l} \text{phys-obj} \\ \text{animate} \end{array} \right\}$</p> <p>$\left[\begin{array}{l} \text{D-ARG1=p : phys-obj} \\ \text{D-ARG2=q : inanimate (liquid)} \end{array} \right]$</p>		
EVSTR	<p>= E1 = e₁ : process</p> <p>E2 = e₂ : state</p>		
QUALIA	<p>= FORMAL = come (e₂, y, x, (p, q)</p> <p>AGENTIVE = come-move (e₂, x, y, (p, q)</p>		

3.2.4. The NP subject denotes [natural object]

Consider the following sentences:

4. a. Diphate di ya motseng.
(Pools go home./to the village)
- b. Tshipi e ya mollong.
(An iron goes to fire.)
- c. Semaphehlane se ya lebenkeleng.
(A beautiful small dress for girls is going to the shop for selling.)
- d. Dikgong di ile bathong.
(Firewood went to the people.)
- e. Tshipi ile mollong.
(An iron went to fire.)
- f. Dikgong di ile bathong le banna.
(Firewood went to people with men.)

- g. Semaphehlana se ile lebekeleng.
(A beautiful small dress (for girls) is going to the shop)
- h. Tshipi e ile mollong le mošomi.
(An iron went to fire with the worker.)
- i. Taemane e ya mošetša ka sekepe le ramoepo.
(Diamond goes to abroad by ship with a miner.)
- j. Leswika le ya laborotaring ka koloi le monna.
(The stone goes to the laboratory by car with a man.)
- k. Leswika le ya leborataring ka sefatanaga ka ramoepo.
(The stone goes to the laboratory by car through the miner.)

The sentences (4a-e) denote the occurrence of a locative complement, ARG(ument) 2 with the verb **ya** (go) which has an NP subject argument 1 bearing the thematic role of theme. The sentences (4f-h) illustrate the same structure and thematic roles. The verb **ya** (go) takes a default argument, D-ARG **le** phrase, **le banna** (with men) realised as a prepositional phrase with the preposition **le** (with) expressing the occurrence of the default argument as a prepositional phrase with **le** which expresses a comitative subject bearing the agent thematic role.

In sentences (4i and j) similar arguments are demonstrated. The NP subject **tshipi** (iron) and **taemane** bear the theme role as ARG(ument) while the prepositional **ka**-phrase, **ka sekepe** (by ship) and **ka koloi** (by car) are default arguments (D-ARG), bearing the instrumental thematic role.

The sentences (4k and l) illustrate the occurrence of two default arguments, which are realised as prepositional **ka** (by) phrase, **ka sekepe** (by ship) and **ka koloi** (by car), bearing the instrumental thematic role, **le** phrase, realised as a prepositional phrase, **le ramoepo** (with a miner), **le monna** (with the man), expresses a comitative subject, bearing the agent thematic role.

The lexical semantic representation of the ver Ya in the sentences in 4 can be given as follows: (Natural objects)

ya 'go'

AGRSTR =	$\left[\begin{array}{l} \text{AGR } 1=x : \text{ inanimate (natural objects)} \\ \text{AGR } 2=y : \text{ locate } \left\{ \begin{array}{l} \text{phys-obj} \\ \text{animate} \end{array} \right\} \\ \\ \left[\begin{array}{l} \text{D-ARG1}=p : \text{ phys-obj} \\ \text{D-ARG2}=q : \text{ inanimate (natural object)} \end{array} \right] \end{array} \right]$
EVSTR	$\left[\begin{array}{l} = \text{ E1} = e_1 : \text{ process} \\ \text{ E2} = e_2 : \text{ state} \end{array} \right]$
QUALIA	$\left[\begin{array}{l} = \text{ FORMAL} = \text{ go } (e_2, y, x, (p, q)) \\ \text{ AGENTIVE} = \text{ go-move } (e_2, x, y, (p, q)) \end{array} \right]$

3.2.5 The NP subject denotes [artifact]

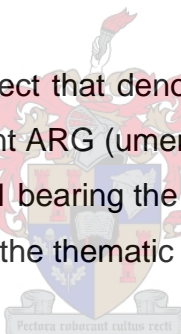
Consider the following sentences:

5. a. Thipa e ya monneng.
(A knife goes to a man)
- b. Piano e ya bathong.
(Piano goes to the people)
- c. Katara e ya monyanyeng.
(The quitar is going to the wedding)
- d. Lepara le ile mokgalabjeng.
(A walking stick went to the old man)
- e. Moropa o ile mocketeng.
(A drum went to the party)
- f. Thipa e ya monneng le mošemane
(The knife goes to a man with a boy)
- g. Baki e ya moroking le mošemane.
(The jacket is going to the tailor with the boy)
- h. Selepe se ya mokgalabjeng ka lesogana.
(An axe goes to the old man by a young man.)



- i. Thipa e ya monneng ka lekgarebe.
(A knife is going to a man by a girl)
- j. Lelepola le ya monyanyeng ka paesekela.
(The spoon goes to the wedding by a bicycle)
- k. Piano e ya bathong ka koloi.
(Piano goes to the people by car)
- l. Katara e ile monyanyeng ka koloi.
(The quitar went to the wedding by car)
- m. Piano e ya le mošemane bathong ka koloi.
(The piano is going with the boy to the people by car.)
- n. Katara e ya monyanyeng ka koloi le monna.
(The quitar is going to the wedding by car with a man)
- o. Baki e ile moroking ka paesekela le mošemane ka peke/mokotla.
(A jacket went to the tailor by bicycle with a boy by a bag)

Sentences (5a-o) have an NP subject that denotes artifacts. They demonstrate the occurrence of a locative complement ARG (ument) 2; with the verb **ya** (go) which has NP subject argument, ARG(ument)1 bearing the thematic role of theme. The locative complement ARG (ument) 2, bears the thematic role of goal in all sentences (5a-o).

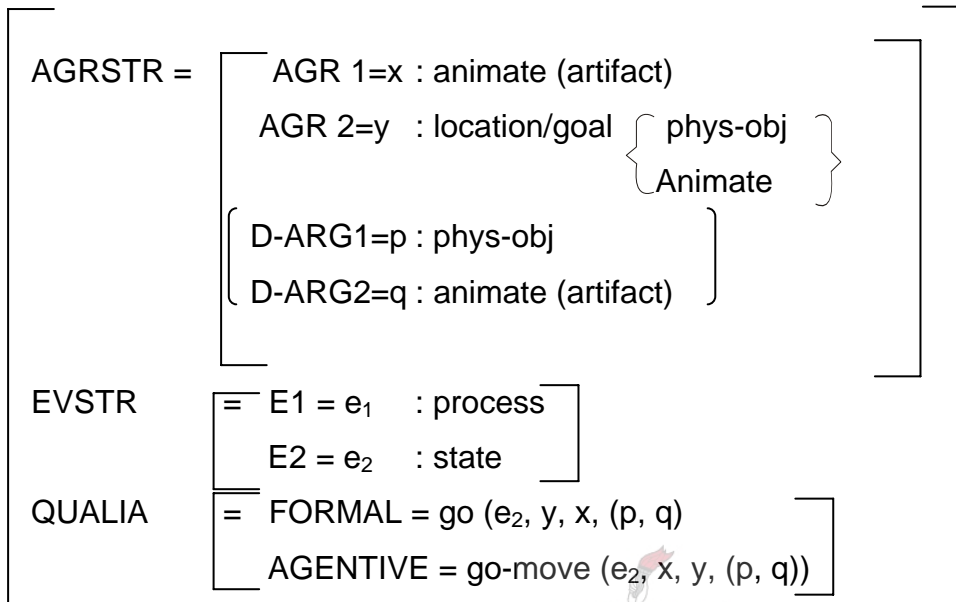


Sentences (5f-h) demonstrate the occurrence of the default argument (D-ARG) which is realised on a prepositional phrase with **le** phrase (with). The prepositional phrases **le monna** (with a man), **le moroki** (with a tailor), express a comitative subject bearing the agent thematic role.

In sentences (5h-l) similar arguments are demonstrated. The NP subject bears the thematic role of theme as ARG (ument) 1, while the prepositional **ka**-phrase is a default argument (D-ARG) **ka lekgarebe** (by the girl), **ka koloi** (by car), bearing the instrument thematic role. Sentences (6m-n) illustrate the occurrence of two default arguments, realised as a prepositional **le**-phrase. The phrases **le mošemane** (with the boy), **le monna** (with the man) express a comitative subject bearing the agent thematic role, the prepositional **ka** phrase, **ka koloi** (by car), **ka paesekela**, **ka peke** (by bag) have default arguments realising the instrument thematic role.

The lexical semantic representation of the verb ya in the sentences in 5 (ARTIFACT)

ya 'go'



3.2.6 The NP subject denotes [Food]

Consider the following sentences:

6. a. Mphago o ya banneng.
(Food for journey goes to men.)
- b. Mokgope o ya mošate.
(The morula beer goes to the head kraal.)
- c. Dijo di ile baneng.
(Food went to the children.)
- d. Ting e ya bathong monyanyeng.
(Sour porridge is going to the people at the wedding.)
- e. Mageu a ile bathong moketeng.
(Mageu went to the people at the party.)
- f. Bjala bo ya kgorong ka lethini.
(Beer goes to the kraal by tin.)
- g. Mabele a ya lešaleng le basadi ka lori ka masaka.
(Maize crops went to the maize building with women by lorry by bags.)
- h. Dikokoro di ile motseng ka sekotlelo.
(Samp went home to the village by a dish.)

- i. Mabele a ile lešaleng le basadi ke masaka.
(Maize crops went to the maize building with the women by bags.)
- j. Mokgope o ya mošate le basadi ka lori.
(The morula beer is going to the head kraal with women by car.)
- k. Mabele a ile lešaleng le basadi ka masaka.
(Maize crops are gone/went to the maize crop building with women by bags.)
- l. Tšhitšhila e ya Makhale ka koloi ka pitša.
(Brisket is going to Makhale by car by pot.)
- m. Tšhitšhila e ya Makhale ka koloi ka pitša le masogana.
(Brisket is going to Makhale by car by pot with young men.)

In all the above sentences the NP subjects, ARG(ument)1 denote food. In (6a-c) the verb ya (go) takes a locative complement, ARG(ument)2, **banneng** (to the men), **baneng** (to children), which bears the thematic role of goal.

Sentences (6d-g) illustrate same structure and thematic roles. The verb **ya** (go) takes a default argument, D-ARG **ka** phrase, **ka lethini** (by tin), **ka masaka** (by bags), **ka sekotlelo** (by dish) realised as a prepositional phrase which bears the instrument thematic role. In sentence (6h) the verb **ya** (go) takes a locative complement, the NP subject argument ARG (ument) 1, bearing the thematic role of goal.

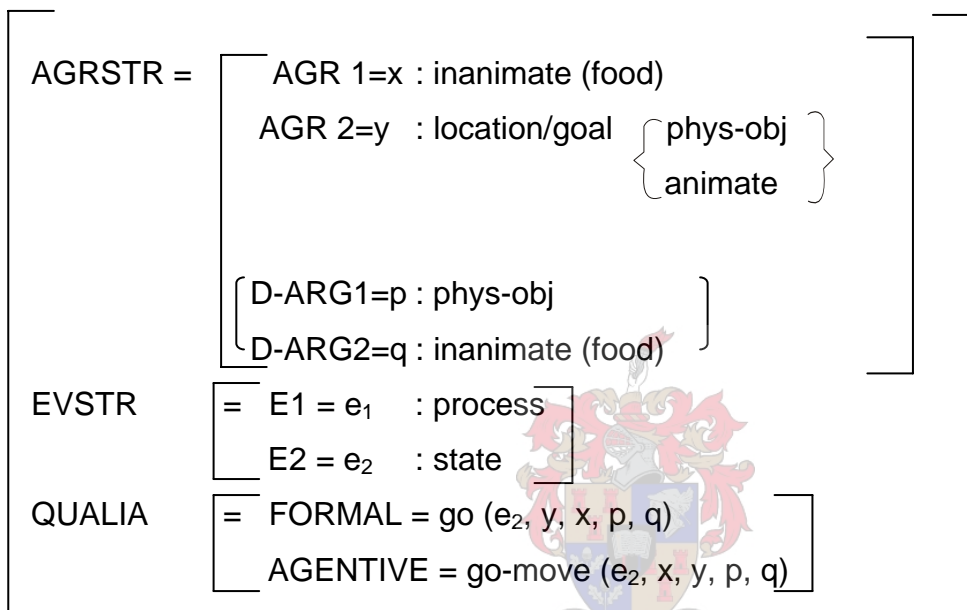
In sentences (6i) similar arguments are illustrated. The prepositional le phrase express a comitative subject bearing the agentthematic role. The **ka**-phrase, **ka masaka** (by bags) is a default argument realising the instrument thematic role. In sentences (6i-k) the verb **ya** (go) takes two locative complements, **bathong** (to people) bearing a theme thematic role and **monyanyeng** (to the wedding), **monyanyeng** (to the wedding), **monyanyeng** (to the party) bearing a locative or goal thematic role.

Sentences (6l-m) illustrate the occurrence of two default argument realised as prepositional **ka** phrase, **ka koloi** (by car) **ka pitša** (by pot), which are default arguments bearing the instrument thematic role, while, sentences (6m) also

illustrates the default argument in the prepositional **le** phrase, **le masogana** (with young men) bearing the agent thematic role.

The lexical semantic representation of the verb ya in the sentences in 6 are as follows. (food)

-ya 'go'



3.2.7 The NP subject denotes [plant]

Consider the following sentences:

7. a. Mpa e ya ngakeng.
(Snake flower goes to the traditional healer.)
- b. Mokgotle o ya femeng.
(Sisal goes to the firm.)
- c. Mpa e ile ngakeng
(The Snake flower went to the traditional healer.)
- d. Mpa e ya ngakeng le mošemane.
(The snake flower goes to the traditional healer with the boy.)
- e. Mohlatswa o ya bathong ka koloi.
(The litchi tree goes to the people by car.)
- f. Meotlwa e ile tseleng ka phefo/moya.
(Thorns went to the path by/through wind.)

- g. Morula o ile bathong ka dipudi.
(Morula tree went to people through goats/by goats.)
- h. Mokgotle o ya femeng le banna ka lori.
(The Sisal goes to the firm with men by car.)
- i. Mohlatswa o ya bathong ka lori ka masaka.
(The litchi tree goes to people by car by bags.)
- j. Morara o ile bathong ka makgowa ka mabetlelo.
(Wine went to people through/by Western people by bottles.)
- k. Monamone o ile mašemong le banna ka masaka ka koloi.
(The Orange tree went to the orchard with men by bags by car.)

The sentences (7a-d) demonstrate the occurrence of a locative complement ARG(ument)2, with the verb ya (go) which has an NP subject argument AGR(ument)1 bearing theme thematic role, the occurrence of the locative/goal argument of **ya** (go) realises the locative complement.

The sentence (7e) illustrates the occurrence of the default argument, realised as a prepositional **le** phrase: **le mošemane** (with a boy) expresses a comitative subject bearing the agent thematic role. In sentences (7f and h) similar arguments are realised, the prepositional **ka** phrase, **ka koloi** (by car) is a default argument (D-ARG) bearing the instrument thematic role, while **dipudi** (goats) are interpreted as the instrument argument through which marula fruit is brought to people, and in (7f) thorns are brought to the road by wind.

In sentences (7i-h) of the verb **ya** (go) takes a locative complement, realised as the NP **bathong** (to the people). The NP subject argument, ARG(ument)1 in sentences (7j and k) bears the thematic role of theme. In the sentences (8i-l) some arguments are realised as prepositional **le** phrase: **le banna** (with men), expresses the comitative subject bearing the agent thematic role. The prepositional **ka** phrase, **ka lori** (by lorry), **ka koloi** (by car), **ka makgowa** (by western people) in (7k) bearing the thematic role of instrument, is interpreted as an agent-like property, **ka mabotlelo** (by bottle) bears the instrument thematic role, denoting the bottle through which wine was brought to the people.

Sentence (71) illustrates the occurrence of default arguments realised as the prepositional **le** phrase, which expresses a comitative subject bearing the thematic role of theme. The prepositional **ka** phrase, **ka masaka** (by bags), **ka kolo** (by car) are default arguments bearing the instrument thematic role.

The lexical semantic representation of the verb ya in the sentences in 7 is as follows: (plant)

Ya 'go'

AGRSTR =	<table border="1"> <tr> <td>AGR 1=x : inanimate (plant)</td> <td rowspan="2">} phys-obj animate }</td> </tr> <tr> <td>AGR 2=y : locative (goal)</td> </tr> <tr> <td colspan="2">[D-ARG1=p : phys-obj]</td> </tr> <tr> <td colspan="2">[D-ARG2=q : inanimate (plant)]</td> </tr> </table>	AGR 1=x : inanimate (plant)	} phys-obj animate }	AGR 2=y : locative (goal)	[D-ARG1=p : phys-obj]		[D-ARG2=q : inanimate (plant)]	
AGR 1=x : inanimate (plant)	} phys-obj animate }							
AGR 2=y : locative (goal)								
[D-ARG1=p : phys-obj]								
[D-ARG2=q : inanimate (plant)]								
EVSTR	<table border="1"> <tr> <td>= E1 = e₁ : process</td> </tr> <tr> <td>E2 = e₂ : state</td> </tr> </table>	= E1 = e ₁ : process	E2 = e ₂ : state					
= E1 = e ₁ : process								
E2 = e ₂ : state								
QUALIA	<table border="1"> <tr> <td>= FORMAL = go (e₂, y, x, (p, q))</td> </tr> <tr> <td>AGENTIVE = go-move (e₂, x, y, (p, q))</td> </tr> </table>	= FORMAL = go (e ₂ , y, x, (p, q))	AGENTIVE = go-move (e ₂ , x, y, (p, q))					
= FORMAL = go (e ₂ , y, x, (p, q))								
AGENTIVE = go-move (e ₂ , x, y, (p, q))								

3.2.8 The NP subject denotes [Action]

Consider the following example sentences:

8. a. Lepeša le ya monyanyeng.
(A sepedi dance is going to the wedding)
- b. Mošomo o ya baneng.
(Work goes to the pupils)
- c. Maikarabelo a ya Moprofeseng Visser
(Responsibility goes to Prof. Visser)
- d. Maitekelo a ile kgole.
(The efforts went far.)
- e. Maikarabelo a ile Moprofeseng.
(Responsibility went to the Professor)
- f. Lepeša le ya monyanyeng le basadi.

(A Sepedi dance is going to the wedding with women, i.e. the women are going to the wedding to dance or the women are accompanying the dancers to the wedding.)

g. Lepeša le ya monyanyeng ka masogana.

(A sepedi dance goes to the wedding by young men; i.e young men are going to the wedding to dance.)

h. Mošomo o ya baneng ka morutiši.

(The work goes to the pupils by the teacher.)

i. Maikarabelo a ya Moprofeseng ka Moreketoro.

(Responsibility goes to the Professor by the Rector.)

j. Metekelo a ile kgole ka dipampiri.

(The efforts went far by papers/through papers.)

k. Maetekelo a ile kgole ka dipampiri le Moprofesa Visser.

(The efforts went far by papers/through papers with Prof. Visser.)

l. Mošomo o ya baneng ka morutiši ka mogala.

(The work goes to the pupils by the teacher through the phone/by phone.)

The sentences in (8) all have an NP subject that denotes an action. In sentences (8a-l) the subject denotes an action, a theme argument. In sentences (8a-l) the verb **ya** (go) takes a locative complement, the NP **monyanyeng** (to the wedding), **baneng** (to the children), **Moprofeseng** (to Prof.). The NP subject argument, ARG(ument) 1 in the sentences of (8a) bear the thematic role of theme, in (8d,j&l) bears the thematic role of goal.

The sentences (8f-m) demonstrate the occurrence of a default (D-ARG) which is realised as prepositional phrases with **ka**, characteristically the instrumental preposition **le** which characteristically introduces an agent-like argument, or theme.

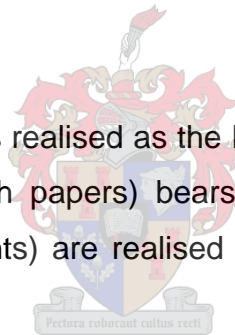
In sentences (8f,h and k) the locative NP argument of **ya** (go) denotes a human goal argument, and the **le** phrase introduces an agent-like argument, **le basadi** (with women) i.e. the women are going to the wedding to dance and/or the women accompanied the dancers to the wedding.

In sentences (8g,h,k) the locative complement ARG(ument) 2, bears the thematic role of goal: the **ka** phrase, **ka masogana** (by young men), **ka morutiši** (by the teacher), **ka Morekoro** (by the Rector), **ka bana** (by children) are realised as the agent-like argument as they are interpreted as the agent argument through which the **lepeša** (the dance), is taken to the wedding, **ka morutiši** (by the teacher), **ka Morekoro** (by the Rector) the **ka** is interpreted as the instrument thematic role.

In sentences (8a) **ka masogana** (by young men) i.e. the young men are going to the wedding to perform (as an instrument), **ka morutiši** (by the teacher) are realised as agent-like argument through which the work or action is brought to the children.

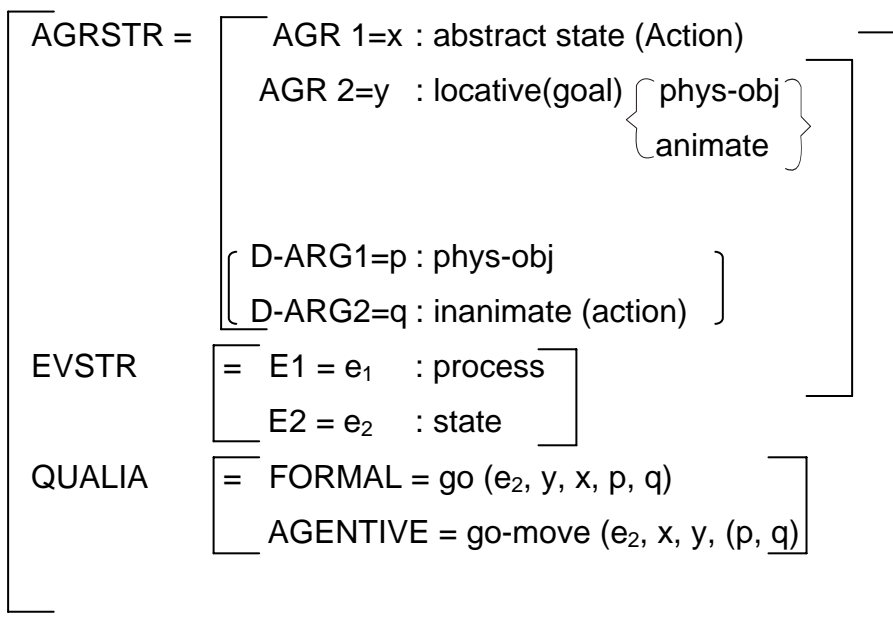
The NP subject argument, ARG1, is the theme while the locative arguments ARG2, **baneng** (to children), **Moprofeseng** and **banneng** are the goal arguments and can also be interpreted as the instrument thematic role through which an action is brought about.

In sentences (8l) the **ka** phrase is realised as the Default argument: the prepositional phrase **ka dipampiri** (by/through papers) bears an instrument thematic role. In sentence (8m) two D-ARG(uments) are realised that bear similar characteristics to the above sentences.



The lexical semantic representation of the verb ya in the sentences in 8 is as follows: action

-ya 'go'



3.2.9 The NP subject denotes [Event]

Consider the following example sentences:

9. a. Papadi e ya mafelelong.
(The game is going to the end (finish).)
- b. Lekgakgasa le ya basading.
(A Sepedi dance is going to the women.)
- c. Papadi e ile mafelelong.
(The game went/went to the end (finish).)
- d. Thupa e ya baneng ka mosadi.
(Corporal punishment goes to children by the woman.)
- e. Lekgakgasa le ya basading ka makgarebe.
(The dance is going to the women by young ladies.)
- f. Papadi e ya mafelelong ka malokwane.
(The game is going to the end (finish) by the referee.)
- g. Thupa e ile baneng ka šiši.
(Corporal punishment went to children by force.)
- h. Dikapešo di ile barutwaneng ka Moreketoro.
(Graduations went to students by the Rector.)
- i. Pulo ya sekolo e ile setshabeng ka hlogo.
(The opening ceremony of the school went to the community through by the principal)
- j. Lekgakgasa le ile basading le bana ka koloi.
(The dance went to the women with the children by car.)
- k. Thekišo ya bjälwa e ile bathong ka monna wa mohumi ka bohlale.
(The selling of liquor went to people by a rich man through wisdom.)

The sentences in (9) all have an NP subject that denotes an event. In sentences (9a-c) the verb **-ya** takes a locative complement only, the NP **mafelelong** (to the end). In sentences (9a,c) the NP **basading** (to the women), and (9b) all have NP subject arguments, ARG (ument) 1 which bears the thematic role of theme. The locative complements, ARG (ument) 2 bears the thematic role of goal.

The sentences in (9d-k) demonstrate the occurrence of default arguments (D-ARG) which are syntactically realised as prepositional phrases with **ka**, characteristically

the instrumental preposition, and / or **le**, which characteristically introduces an agent – like argument. In (9d), the locative NP argument, ARG(ument) 2, with the prepositional **ka**-phrase **ka mosadi** (through the woman) is realised as the agent-like argument **mosadi** (woman) since the woman is interpreted as the agent argument through which punishment is brought to the children.

Sentence (9e) demonstrates similar properties to (9d). The NP subject argument, ARG1, is the theme while the locative argument, ARG2 **basading** (to the women) is the goal argument. The prepositional phrase **ka makgarebe** (through young ladies) bears agent-like properties, since the young ladies are interpreted as the people who perform the dance.

Sentence (9g) has similar properties to (9d, e), where the prepositional phrase **ka Moreketoro** (through the Rector), a default argument (D-ARG) bearing an agent-like thematic role: the Rector is interpreted as the person who makes graduation possible. Sentence (9i) is similar to sentences (9d, e, and g) with the default argument (D-ARG), where the prepositional phrase default argument **ka monna** (through the man) similarly bears an agent-like argument in which the man is interpreted as the one who sold liquor to the people.



In the case of sentence (9g) the prepositional phrase **ka šiši** realises an abstract instrumental argument which functions as a manner adjunct. In (9j) the default argument, the prepositional phrase **ka kolo**i bears an instrument thematic role while the other default argument is realised as the prepositional phrase **le bana** (with children) is interpreted as an agent-like argument since the children are understood to take the dance to the women.

It is evident from the above example sentences that the agent-like argument can be realised either as a prepositional **le**- phrase (as in 9) or as a **ka** – phrase as in (9d, e, f,h,i,k). The instrument thematic role is realised as a **ka**- phrase.

The lexical semantic representation of the verb – ya (go) in the sentences in 9 can be given as follows:

-ya 'go'

AGRSTR =	<table border="1"> <tr> <td>AGR 1=x : abstract -state</td> <td rowspan="2">} phys-obj animate }</td> </tr> <tr> <td>AGR 2=y : locative (goal)</td> </tr> <tr> <td colspan="2">} D-ARG1=p : animate/inanimate</td> </tr> <tr> <td colspan="2">} D-ARG2=q : animate (inanimate)</td> </tr> </table>	AGR 1=x : abstract -state	} phys-obj animate }	AGR 2=y : locative (goal)	} D-ARG1=p : animate/inanimate		} D-ARG2=q : animate (inanimate)	
AGR 1=x : abstract -state	} phys-obj animate }							
AGR 2=y : locative (goal)								
} D-ARG1=p : animate/inanimate								
} D-ARG2=q : animate (inanimate)								
EVSTR	<table border="1"> <tr> <td>= E1 = e₁ : process</td> </tr> <tr> <td>E2 = e₂ : state</td> </tr> </table>	= E1 = e ₁ : process	E2 = e ₂ : state					
= E1 = e ₁ : process								
E2 = e ₂ : state								
QUALIA	<table border="1"> <tr> <td>= FORMAL = go (e₂, y, x, (p, q)</td> </tr> <tr> <td>AGENTIVE = go-move (e₂, x, y, p, q)</td> </tr> </table>	= FORMAL = go (e ₂ , y, x, (p, q)	AGENTIVE = go-move (e ₂ , x, y, p, q)					
= FORMAL = go (e ₂ , y, x, (p, q)								
AGENTIVE = go-move (e ₂ , x, y, p, q)								

3.2.10 The NP subject denotes [state]

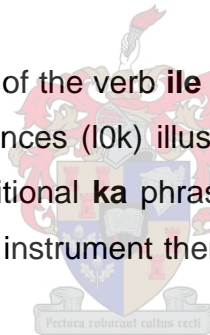
Consider the following example sentences:

10. a. Dihlong di ya bathong.
(Feeling of shame goes to people.)
- b. Dihlong di ile setšhabeng.
(Feeling of shame went to the community.)
- c. Maswabi a ya bathong ka maitshwaro a mabe.
(Shame goes to the people through bad behaviour.)
- d. Dihlong di ya setshabeng ka maitshwaro a bohlaswa.
(Feeling of shame went to people through bad behaviour.)
- e. Bohlale bo ya baneng ka tekenolotši.
(Intelligence goes to the children through technology.)
- f. Bofsega bo ya bathong ka Mapogo a mathamaga.
(Fear goes to people by a group of people named "Mapogo a Mathamaga.")
- g. Botlaela bo ile ngwaneng ka go llelwa.
(Stupidity went to the child by crying for him.)
- h. Botagwa bo ile bathong ka morula.
(Intoxication/drunkenness went to people through morula beer.)

- i. Bolwetši bo ile bja ata bathong ka bjalwa.
(Illness went and multiplied to people by liquor.)
- j. Borokorokwane bo ile bathong ka dipilisi.
(Drowsiness' went to people by drug tablets.)
- k. Tsholo e ile banneng ka kgoši ka sebele.
(Blame went to men by the king by himself.)

The sentences in (10) all have an NP subject that denotes a state. The locative ARG(ument)2 bears the thematic role of goal. The sentences (10c-j) demonstrate the occurrence of the default argument (D-ARG) which are syntactically realised as prepositional phrase with **ka**, characteristically seen as the instrumental preposition, **ka maitshwaro** (behaviour), **ka tekenolotši** (through technology), **ka Mapogo a Mathamaga**, through a group called Mapogo a Mathamaga, **ka morula** (through morula), respectively.

In sentences (10i) the occurrence of the verb **ile** (went) has an ARG(ument)2 bearing the thematic role of goal. Sentences (10k) illustrates the occurrence of two default arguments, realised as a prepositional **ka** phrase, **ka kgoši** (through the king) with the default argument bearing the instrument thematic role, **ka sebele** (by him) bears an expression of one self.



The lexical semantic representation of the verb ya in sentences of 10 is as follows: (state)

-ya 'go'

AGRSTR =	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> AGR 1=x : abstract state AGR 2=y : locative (goal) </div> <div style="font-size: 2em; margin: 0 10px;">}</div> <div style="border: 1px solid black; padding: 5px;"> phys-obj animate </div> </div>
	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> D-ARG1=p : inanimate/inanimate D-ARG2=q : animate/inanimate </div> </div>
EVSTR	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> = E1 = e₁ : process E2 = e₂ : state </div> </div>
QUALIA	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> = FORMAL = go (e₂, y, x, (p, q)) AGENTIVE = go-move (e₂, x, y, (p, q)) </div> </div>

3.2.11 The NP subject denotes [Illness]

Consider the following example sentences:

12. a. Sekaku se ya mothong.
(An abcess goes to a person.)
- b. Lephera le ya mosetsaneng.
(Epilepsy goes to the girl.)
- c. Mooko o ya baneng.
(Measles go to the children.)
- d. Seokelela se ya banneng ka bjalwa.
(Heartburn goes to men by liquor.)
- e. Mooko o ya baneng ka phetetšo.
(Measles go to children by infection/transmission.)
- f. Dišo di ya mošemaneng ka bošaedi.
(Body rash go to the boy through/by carelessness.)
- g. Sethehu se ya mothong ka mabu.
(Hick-up goes to a person by soil.)
- h. Lephera le ile mošemaneng ka tlala.
(Epilepsy went to the boy through hunger.)
- i. Sekaku se ile mothong ka botšwa.
(Abcess went to a person through laziness.)

All the sentences in (11) have an NP subject that denotes illness. The verb **ya** takes a locative complement, (ARG(ument)2, realising the goal argument, i.e. the NP **mothong** (to a person), **mosetsaneng** (to a girl), **baneng** (to the children), **banneng** (to the men), **mosemaneng** (to the boy). All the NP subject arguments, bear the thematic role of theme, i.e. ARG(ument)1.

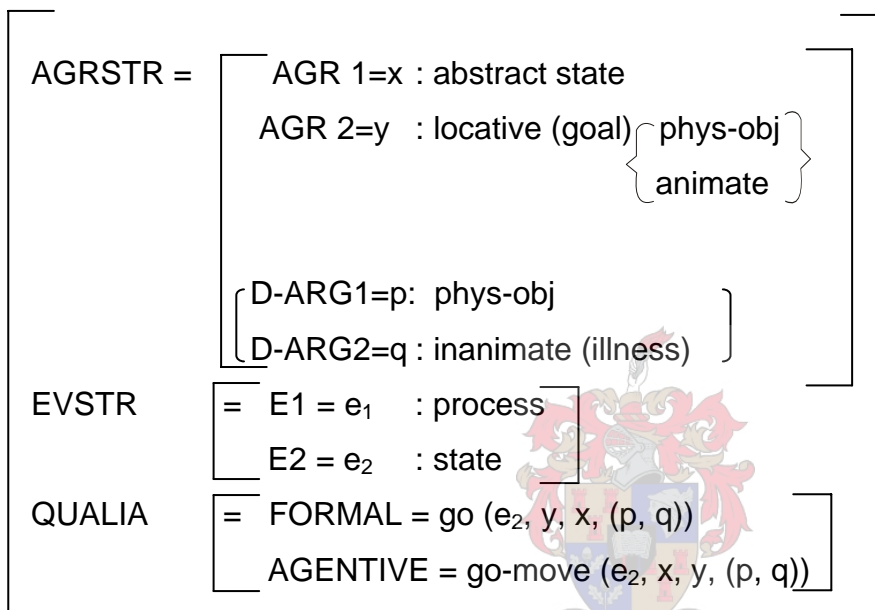
The sentences in (11d-l) demonstrate the occurrence of a default argument (D-ARG) which is syntactically realised as a prepositional phrase with **ka**, characteristically the instrumental preposition. In all the sentences the locative NP argument of **ya** denotes a goal argument.

The NP subject argument as locative argument (ARG) **bathong** (to people) is the goal argument. Sentences (11d,f,g,h,i) demonstrate the occurrence of a default

argument (D-ARG), **ka** phrase which is realised as an abstract instrumental argument which functions as a source. It is understood that if it was not **bošaedi** (carelessness) she would not had **dišo** (body rash), **ka botšwa**, she wouldn't have **sekaku** (abcess).

The lexical semantic representation of the verb ya in the sentences in (11) are as follow: (illness)

-ya 'go'



3.2.12 The NP subject denotes [CULTURE]

Consider the following example sentences:

12. a. Setšo sa Bapedi se ya bathong.
(The Bapedi culture goes to the people.)
- b. Badika ba ya kgorong.
(Group of boys from mountain school goes to the kraal.)
- c. Bodika bo ile morotong.
(The boys from circumcision went to the mountain school.)
- d. Thlago e ya le mabaka.
(Culture goes with time/circumstances.)
- e. Moila o ile le mabaka.
(Taboo went away with time.)
- f. Tlhago e ile le mabaka.
(Culture went away with time.)

- g. Diphaso di ile le bomakgolo.
(Rituals went away with our ancestors.)
- h. Lebollo le ile le meši ya dikwekwele.
(Circumcision went away with the past event.)
- i. Badika ba ya kgorong ka koloï.
(Group of boys from circumcision go to the kraal by car.)
- j. Setšo se ile mothong ka dipuku.
(Culture goes to people through books.)
- k. Setšo se ya bathong ka dipuku ka hlogo.
(Culture goes to people through books by nature.)

The sentences in (I2) all have an NP subject that denotes culture. In sentences (12 a,b,g,i,j,k,l), the verb **ya** takes a locative complement, the ARG(ument)2, i.e. the NP **bathong** (to people), **kgorong** (to the kraal) and (I2c), **mabaka** (circumstances). The NP subject argument, ARG(ument)1 in sentences (I3) bears the thematic role of theme. The locative complement ARG (ument) 2 bears the thematic role of goal.

The sentences (I2c-h) demonstrate the occurrence of a default argument (D-ARG) which is syntactically realised as prepositional phrases with the **le** (with/together with) **le mabaka** (with time) **le bomakgolo** (with ancestors) **le mesi ya dikwelekwela** (with the past event) realised as abstract instrumental adjunct.

Sentences (I2i-j) demonstrate the occurrence of the default argument (D-ARG), realised as prepositional phrase with the **ka** (by/through) phrase: **ka koloï** (by car), **ka puku** (through books), characteristically realised as an instrumental preposition. Sentences (12i) demonstrate the occurrence of two default arguments, realised as prepositional **ka** phrase, **ka dipuku** (through books) bearing an instrumental thematic role, **ka hlogo** (by nature) realised as an abstract instrument adjunct.

The lexical semantic representation of the verb ya in the sentences in 12 is as follows: (culture)

-ya 'go'

AGRSTR =	<table border="1"> <tr> <td>AGR 1=x : abstract state</td> <td></td> </tr> <tr> <td>AGR 2=y : locative (goal)</td> <td>{ phys-obj }</td> </tr> <tr> <td></td> <td>{ animate }</td> </tr> </table>	AGR 1=x : abstract state		AGR 2=y : locative (goal)	{ phys-obj }		{ animate }
AGR 1=x : abstract state							
AGR 2=y : locative (goal)	{ phys-obj }						
	{ animate }						
	<table border="1"> <tr> <td>D-ARG1=p : phy(sical) object</td> <td rowspan="2">}</td> </tr> <tr> <td>D-ARG2=q : inanimate (culture)</td> </tr> </table>	D-ARG1=p : phy(sical) object	}	D-ARG2=q : inanimate (culture)			
D-ARG1=p : phy(sical) object	}						
D-ARG2=q : inanimate (culture)							
EVSTR	<table border="1"> <tr> <td>= E1 = e₁ : process</td> </tr> <tr> <td>E2 = e₂ : state</td> </tr> </table>	= E1 = e ₁ : process	E2 = e ₂ : state				
= E1 = e ₁ : process							
E2 = e ₂ : state							
QUALIA	<table border="1"> <tr> <td>= FORMAL = go (e₂, y, x, (p, q)</td> </tr> <tr> <td>AGENTIVE = go-move (e₂, x, y, (p, q)</td> </tr> </table>	= FORMAL = go (e ₂ , y, x, (p, q)	AGENTIVE = go-move (e ₂ , x, y, (p, q)				
= FORMAL = go (e ₂ , y, x, (p, q)							
AGENTIVE = go-move (e ₂ , x, y, (p, q)							

3.2.13 The NP subject denotes [COMMUNICATION]

Consider the following example sentences:

13. a. Kwano e ya bofelong.
(The agreement is going to an end.)
- b. Dipego di ya bathong.
(Announcements go to the people.)
- c. Molao o ile mošate.
(The law went to the head kraal.)
- d. Dipego di ile bathong.
(The law went to the head kraal.)
- e. Kwano e ile bofelong.
(The agreement went to an end.)
- e. Papadi ya Tshipu e ya nhlorwaneng.
(The play by Tshipu is going to the climax.) or
(The play Tshipu is going to the climax)
- f. Papadi ya Tshipu e ile bathong.
(The play by Tshipu came to the people.)
- g. Diema di ya bathong ka seyalemoya.
(Proverbs go to the people by/through radio.)

- h. Papadi ya Tshipu e ya baneng ka lesogana.
(The play Tshipu goes to the children by a young man.)
- i. Dika di ile setšhabeng ka seyalemoya.
(Idioms went to the community by radio.)
- j. Molao o ile mošate ka Molekgotla-phethiši.
(The law went to the head kraal by the MEC.)
- k. Polelo e ile ka moemedi wa lapa bathong.
(Speech went to the people by family representative.)
- l. Kwano e ile bofelong ka modulasetulo.
(The agreement went to an end by the chairperson.)

All the sentences in (13) have NP subjects, ARG(ument)1, that denote communication. In all the sentences (13a-g) the verb **-ya** (go) takes a locative complement ARG(ument)2 only, the NP **bofelong** (to an end), in (13a, e) and the NP **bathong** (to the people) and **nhlorwaneng** (to climax). All the NP subject argument (ARG(ument)1 in the sentences of (13) bear the thematic role of theme.

The locative complements, ARG(ument) 2, bear the thematic role of goal. The sentences (13h-m) demonstrate the occurrence of default argument (D-ARG) which syntactically realised as prepositional phrase with **ka**, characteristically the instrumental preposition. The locative NP argument of **ya** (go) denotes a human goal argument, ARG(ument)2, while the prepositional phrase **ka**-phrase, **ka lesogana** (by a young man), **ka Molekgotlaphethiši** (by the MEC), **ka moemedi** (by the representative) bears the agent-like argument through which **papadi** (play) **molao** (law), **polelo** (speech), were brought to the people. In (13h and l) bathing,, to the people and **baneng** (to children) (13j), to community, (13k) to the head kraal (13e) to an ending, bear similar arguments.

In sentences (13k) **ka Molekgotlaphethisi** (by MEC) demonstrates a default argument (D-ARG) bearing an agent-like argument in which the MEC is interpreted as a person who brought the law to the head kraal. In (13h and j) the prepositional phrase **ka seyalemoya** (by radio/or through radio) bears an instrument thematic role.

The lexical semantic representation of the verb ya in the sentences in 13 can be as follows: (communication)

-ya 'go'

AGRSTR =	<table border="1"> <tr> <td>AGR 1=x : abstract state</td> <td></td> </tr> <tr> <td>AGR 2=y : locative (goal)</td> <td rowspan="2"> { phys-obj animate } </td> </tr> <tr> <td></td> </tr> <tr> <td>D-ARG1=p : phys-obj</td> <td rowspan="2"> } </td> </tr> <tr> <td>D-ARG2=q : inanimate (communication)</td> </tr> </table>	AGR 1=x : abstract state		AGR 2=y : locative (goal)	{ phys-obj animate }		D-ARG1=p : phys-obj	}	D-ARG2=q : inanimate (communication)
AGR 1=x : abstract state									
AGR 2=y : locative (goal)	{ phys-obj animate }								
D-ARG1=p : phys-obj	}								
D-ARG2=q : inanimate (communication)									
EVSTR	<table border="1"> <tr> <td>= E1 = e₁ : process</td> </tr> <tr> <td>E2 = e₂ : state</td> </tr> </table>	= E1 = e ₁ : process	E2 = e ₂ : state						
= E1 = e ₁ : process									
E2 = e ₂ : state									
QUALIA	<table border="1"> <tr> <td>= FORMAL = go (e₂, y, x, (p, q)</td> </tr> <tr> <td>AGENTIVE = go-move (e₂, x, y, (p, q)</td> </tr> </table>	= FORMAL = go (e ₂ , y, x, (p, q)	AGENTIVE = go-move (e ₂ , x, y, (p, q)						
= FORMAL = go (e ₂ , y, x, (p, q)									
AGENTIVE = go-move (e ₂ , x, y, (p, q)									

3.2.14 The NP subject denotes [Cognition]

Consider the following example sentences:

14. a. Bothata bo ya kgorong
(The problem is going to head kraal.)
- b. Tsebo e ya bathong.
(Knowledge goes to the people.)
- c. Maikarabelo a ya motswading.
(Responsibility goes to the parent.)
- d. Molao o ya mošate bathong.
(The law/principle is going to the head kraal to the people)
- e. Molao o ile bathong.
(The law/principle went to the people.)
- f. Tsebo e ile bathong.
(Knowledge went to the people.)
- g. Molao o ya kgošing ka Molekgotlaphethiši.
(The principle goes to the king by the MEC.)
- h. Tsebo e ya bathong ka tekenolotši.
(Knowledge goes to the people through technology.)
- j. Maikarabelo a ya motswading ka nama.

(Responsibility goes to the parent by meat.)

- k. Maikarabelo a ile motswading ka nama.

(Responsibility went to the parent by meat.)

- l. Mathata a ya motswading ka nama ka noši.

(The problem goes to the parent by meat by oneself.)

The sentences in (14) all have NP subjects ARG(ument)1, that denote cognition. The verb **ya** takes a locative complement, ARG(ment)2, the NP **kgorong** (to head kraal) and the NP **bathong** (to people), **motswading** (to parent) and **kgošing** (to the king). All the NP subject arguments, ARG (ument) 1, have the thematic role of theme. The locative complement, ARG (ument) 2, bears the thematic role of goal.

The sentences in (14g-k) also demonstrate the occurrence of a default argument (D-ARG) which is syntactically realised as prepositional phrase with the **ka**, characteristically the instrumental preposition. The locative NP argument of **ya** in (14g), denotes a goal argument, (ARG (ument) 2, through the prepositional phrase **ka** phrase **ka** characteristically the instrumental preposition. The locative NP argument of **ya** in (14g), the sentence denotes a human goal argument, (ARG(ument)2, where the prepositional phrase, the **ka** phrase **ka Molekgotlaphethiši** (through/by MEC) bears the agent-like argument, since the MEC is interpreted as an agent argument through which the principle goes/brought to the king.

In sentences (14h) the same properties as in (14g) are demonstrated. The occurrence of default argument (D-ARG), syntactically realised as a prepositional phrase with **ka**, characteristically bears the instrumental thematic role.

In sentences (14i-k) the default argument, the prepositional phrase **ka nama** (by meat and or self), bears the instrument-like thematic role, since the parent himself (by meat) is interpreted as the person who carries the responsibilities, is understood that if the parent does not carry the responsibility, no one can do so.

The lexical semantic representation of the verb ya in the sentences in 14 is as follows: (cognition)

-ya 'go'

AGRSTR =	AGR 1=x : abstract AGR 2=y : locative (goal)	{ phys-obj animate }
	[D-ARG1=p : phys-obj D-ARG2=q : inanimate (cognition)]	
EVSTR	= E1 = e ₁ : process E2 = e ₂ : state	
QUALIA	= FORMAL = go (e ₂ , y, x, (p, q) AGENTIVE = go-move (e ₂ , x, y, (p, q))	

3.2.15 The NP denotes [Feeling]

Consider the following example sentences:

15. a. Lerato le ya bathong.
(Love goes to the people.)
- b. Lethabo le ile baneng.
(Joy went to the children)
- c. Tlhompo e ya batswading ka bana.
(Respect goes to parents by/through children.)
- d. Tshepo e ya bathong ka Mopresitente.
(Hope goes to people by/through the President.)
- e. Toka e ya baneng ka mosadi.
(Kindness goes to children by the woman.)
- f. Kwelobohloko e ile mosading ka sello.
(Sympathy went to the woman through/by cry.)
- g. Tumo e ile bathong ka papatšo.
(Desire went to people by/through advertisement.)
- h. Fufulelo e ile bathong ba bolaya ka sekgame.
(Anger went to the people and they killed by anger.)

All the sentences in (15) have the NP subjects, ARG(ument)1, that denote feeling. In all the sentences the verb **ya** take a locative complement ARG(ument)2. Sentences (15a-b) have a locative complement only, ARG(ument)2, i.e. **bathong** (to people) and **baneng** (to the children). All the NP subject argument, ARG (ument) 1, in the sentences of (15) bear the thematic role of theme. The locative complements (ARG (ument) 2 bear the thematic role of goal.

The sentences (15c-g) demonstrate the occurrence of a default argument (D-ARG) which is syntactically realised as prepositional phrase with **ka**, characteristically the instrumental preposition. The locative NP argument of **ya** (go/went) denotes human goal argument ARG (ument) 2: the prepositional **ka**-phrase **ka bana** (by children), **ka Mopresitente** (by the President), **ka mosadi** (by the woman) are interpreted as the agent argument through which respect is brought through children, to the parent.

In (15f) the occurrence of the default (D-ARG) **ka sello** (through cry), **sello** (cry) bears the instrument-like prepositional phrase since **sello** (cry) interpreted as an instrument through which a feeling of sympathy came to the woman. In (15g) same properties in (15f) are displayed since **ka-papatšo** is interpreted as an instrument through which desire went to the people.



In sentences (15h) the default argument (D-ARG) realised in the **ka**-phrases, **ka sekgame** (through/by anger) has an instrument-like thematic role, since anger made the people to kill though it was not the intension.

The lexical semantic representation of the verb ya in the sentences in 15

-**ya** 'go'

AGRSTR =	<table border="1"> <tr> <td>AGR 1=x : abstract state</td> <td rowspan="2">} phys-obj animate }</td> </tr> <tr> <td>AGR 2=y : locative (goal)</td> </tr> <tr> <td colspan="2">} D-ARG1=p : inanimate (feeling)</td> </tr> <tr> <td colspan="2">} D-ARG2=q : phys-obj</td> </tr> </table>	AGR 1=x : abstract state	} phys-obj animate }	AGR 2=y : locative (goal)	} D-ARG1=p : inanimate (feeling)		} D-ARG2=q : phys-obj	
AGR 1=x : abstract state	} phys-obj animate }							
AGR 2=y : locative (goal)								
} D-ARG1=p : inanimate (feeling)								
} D-ARG2=q : phys-obj								
EVSTR	<table border="1"> <tr> <td>= E1 = e₁ : process</td> </tr> <tr> <td>E2 = e₂ : state</td> </tr> </table>	= E1 = e ₁ : process	E2 = e ₂ : state					
= E1 = e ₁ : process								
E2 = e ₂ : state								
QUALIA	<table border="1"> <tr> <td>= FORMAL = go (e₂, y, x, (p, q)</td> </tr> <tr> <td>AGENTIVE = go-move (e₂, x, y, (p, q)</td> </tr> </table>	= FORMAL = go (e ₂ , y, x, (p, q)	AGENTIVE = go-move (e ₂ , x, y, (p, q)					
= FORMAL = go (e ₂ , y, x, (p, q)								
AGENTIVE = go-move (e ₂ , x, y, (p, q)								

3.3 SUMMARY

This chapter examined the verb **ya** (go) as a motion verb. The sentences examined illustrate the movement of objects or even human beings. We have observed in example sentences given throughout the chapter that they are basically demonstrating the occurrence of **locative** complement ARG. With the verb ya (go) with an NP. Subject argument.

Within the range of sentences, the thematic role of the Agent, and the default argument, D-ARG **ka** (with) realized as a prepositional phrase which expresses the instrument thematic role were considered:

- (a) Basadi ba ile monyanyeng **ka** koloi
The women went to the wedding by/with a car.

Certain sentences illustrated of the occurrence of two default arguments realised as a prepositional le phrase, which expresses a comitative subject bearing the agent thematic role. Attention was given to the preposition **ka** phrase as default argument realises the instrument thematic role, e.g.

Ramahlale o ya mošetša ka sefofane le mopresitente ka dithuto
(The scientist goes to abroad by aeroplane with the president through education).

The range of example sentences with **-ya** examined in this chapter demonstrated the range of polysemous meanings of sentences with **ya** in combination with the verb constellation arguments, i.e. the subject argument and the verb complements.



CHAPTER FOUR

THE POLYSEMY OF THE VERB “TLA” (‘COME’) IN NORTHERN SOTHO

4.1 INTRODUCTION

In this chapter the main aim is to explore the polysemy of sentences with the verb – **tla** in Northern Sotho (Sepedi). Attention will be focused on the verb **tla** (‘come’) employing the generative theory of the lexicon outlined in chapter two. This chapter will examine the event structure of the verb **tla** and it will also explore the Qualia structure, and the Event structures of the verb **tla** as it occurs in a range of sentences.

The chapter also examines the **tla** verb in sentences with the preposition **ka** and **ie**. The chapter will examine the verb **tla** as a motion verb which expresses the movement of people, animals, objects etc. in different ways that movement is carried out. The sentences with the verb **tla** demonstrate the polysemy of certain types of movements due to conditions circumstances and reasons expressed by elements in the verb constellation (i.e. subject and complements).

In this chapter focus is on the NP subject that denotes e.g. human, animals, object, feeling etc in addition to the argument structure, the event structures and the qualia structure. Consider the following examples:

- (160) Basadi ba **tla** nokeng.
 (Women are coming to the river)
- * Dikgong di **tla** mošate.
 (Firewood come to the head kraal)

4.2 TLA

4.2.1. The NP subject denotes [Human]

Consider the following example sentences:

1. a. Mosetsana o tla sekolong.
 (The girl comes to school)

- b. Mokgekolo o tla bookelong.
(The old lady comes to hospital.)
- c. Dialoga di tla gae.
(Graduates come home)
- d. Bašemane ba tlile madišong.
(Boys came to the grazing field)
- e. Makgarebe a tlile/ ba tlile dikgonyeng.
(Young ladies came to collect firewood)
- f. Dialoga di tla gae ka sefofane
(Graduates come home by flight.)
- g. Baruti ba tla gae ka sekepe.
(Priests come home by ship)
- h. Bašemane ba tla gae ka paesekela.
(The boys come home by bicycle.)
- i. Morutiši o tlile sekolong le bana ka pese.
(The teacher came to school with children by bus.)
- j. Mma o tlile gae le papa ka kolo.
(Mother came home with dad by car.)

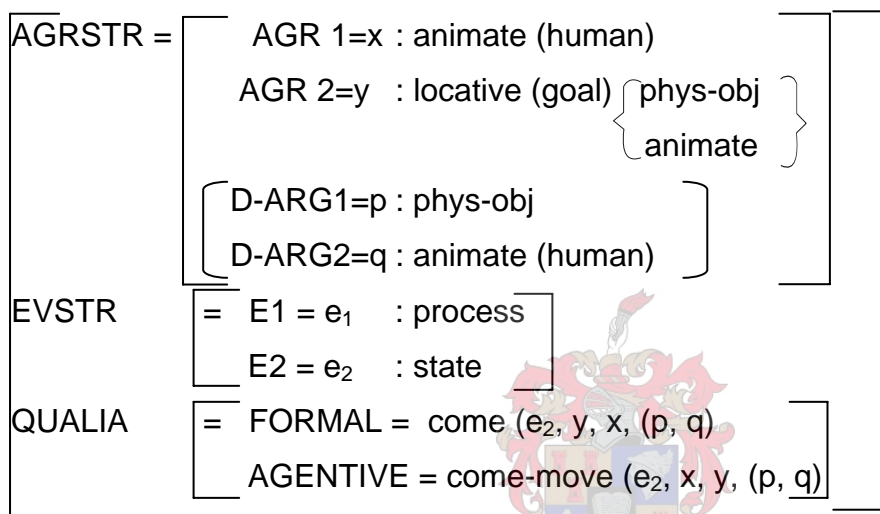
The sentences (1a-h) demonstrate the occurrence of a locative complement, ARG(ument)2, with the verb **tla** (come), which has an NP subject argument, ARG(ument)1, bearing the thematic role of Agent. Sentences (1a-e) illustrate the thematic role of an Agent subject. Sentence (1f) illustrates the same structure. In addition, the verb **tla** (come) takes a default argument, D-ARG **ka sefofane** (by flight) which realised as a prepositional phrase with the prepositional **ka** which is realised as the instrument **ka**-phrase **ka sekepe** bears an instrument thematic role.

Sentences (1f) bears the same structure, the verb **tla** (come), has an NP subject argument ARG(ument)1, which bears the agent thematic role. The NP subject **bašemane** (boys) bears the agent role as ARG(ument)1, while the prepositional **ka**-phrase, **ka paesekela** is a default argument (D-ARG) bearing the instrument thematic role.

Sentences (lg-h) illustrate the occurrence of two default arguments, realised as a prepositional **le**-phrase, **le bana** (with children) which expresses instrument thematic role, and the prepositional **ka**-phrase, **ka pese** (by bus) **ka kolo** (by car), which realises the instrument argument.

The lexical semantic representation of tla in the sentences in 1:

Tla (come)



4.2.2 The NP subject denotes [Animal]

Consider the following example sentences:

2. a. Dipudi di tla šakeng.
(Goats come to the kraal.)
- b. Dinku di tla phulong.
(Sheep come to the grazing place.)
- c. Ditšhwene di tla tšhemong.
(Baboons come to the field.)
- d. Ditau di tlile motseng.
(Lions came to the village.)
- e. Dikubu di tlile bodibeng/letamong.
(Hippos came to the dam.)
- f. Tlou e tla lešokeng ka kolo.
(An elephant comes to the bush by car.)

- g. Dithutlwa di tla South Africa ka sekepe.
(Giraffes come to South Africa by boat.)
- h. Tlou e tlile lešokeng ka koloi.
(An elephant came to the bush by car.)
- i. Dithutlwa di tlile South Africa ka sekepe.
(Giraffes came to South Africa by ship.)
- j. Tau e tla Kapa le monna.
(A lion comes to Cape with the man.)
- k. Dinare di tlile Tshwane le mosadi.
(Buffalos came to Tshwane with a woman.)
- l. Mebutla e tla bathong ka masaka le banna ka sekepe.
(Hares come to the community by bags with men by ship.)

The sentences in (2) all have an NP subject, ARG(ument)1, that denotes animal. In sentences (2a-e) the verb **tla** (come) takes a locative complement, ARG(ument)2, the NP **šakeng** (to kraal), **phulong** (to graze), **tšhemong** (to the field), **motseng** (to the village), and **letamong** (to the dam). All the NP subject arguments, (ARG(ument)) 1, in sentences of (2) bear the thematic role of theme. The locative complements, ARG(ument) 2 bears the thematic role of goal.



The sentences (2f-i) demonstrate the occurrence of the default argument (D-ARG) which are syntactically realised as a prepositional phrases with the **ka**, characteristically the instrumental preposition, **ka koloi** (by car) in (2a), **ka sekepe** (by ship). The NP subject argument ARG1, is the theme while the locative argument, ARG 2 **lešokeng**_(to the bush), **South Africa** is the goal argument.

The sentences (2 i-k) demonstrate the occurrence of the default argument (D-ARG) which are syntactically realized as a prepositional phrase, with the **le** (with) phrase: **le monna** (with the man), **le mosadi** (with the women). Sentence (2l) demonstrates the occurrence of default arguments, realized as the prepositional phrases **ka masaka** (by bags) and **ka sekepe** with the instrumental preposition, and the associative prepositional phrase **le banna** (with men), realising a comitative subject, made it possible for the hares to go to the people.

The lexical semantic representation of tla in the sentences in 2

Tla (come)

AGRSTR =	<p>AGR 1=x : animate (animals)</p> <p>AGR 2=y : locative (goal) } }</p> <p style="margin-left: 100px;">place</p> <p style="margin-left: 100px;">animate</p> <p>D-ARG1=p : place</p> <p>D-ARG2=q : animate (animals)</p>
EVSTR	<p>= E1 = e₁ : process</p> <p>E2 = e₂ : state</p>
QUALIA	<p>= FORMAL = come (e₂, y, x, (p, q))</p> <p>AGENTIVE = come-move (e₂, x, y, (p, q))</p>

4.2.3. The NP subject denotes [Natural Phenomena]

Consider the following example sentences:

3. a. Phoka e tla bjanyeng.
(Drizzle comes to the grass.)
- b. Lehlwa le tla thabeng.
(Snow comes to the mountain.)
- c. Pula e tla lefaseng.
(Rain comes to earth)
- d. Phefo e tlile lewatle.
(Wind came to the sea.)
- e. Phoka e tla bjanyeng ka pula.
(Drizzle comes to the grass through rain.)
- f. Leretha le tla motseng ka moya.
(Dust comes to the village through/by wind.)
- g. Marega a tlile lefaseng ka pula.
(Winter comes on earth by/through wind.)
- h. Seetša se tlile Kapa ka letšatši.
(Light came to Cape by/through the sun.)
- i. Phefo e tla lefaseng ka maru le pula.
(Cold comes on earth through/by clouds and / with rain.)



- j. Phefo e tla bathong ka maru ka pula.
(Cold comes to the people through cloud by rain.)

The sentences (3a-d) demonstrate occurrence of a locative complement, realising the goal argument, ARG(ument)2, with the verb **tla** (come) which have an NP subject, ARG(ument) 1, bearing the thematic role of theme. In sentence (3e) the verb **tla** (come) takes the default argument (D-ARG) **ka pula** (through rain) realized as prepositional phrase bearing the instrument thematic role. Similarly in (3f) the prepositional **ka** phrase **ka moya** (by wind/through wind) bears the instrument thematic role)

In sentences (3g-j) similar arguments are demonstrated. The NP subject argument, ARG(ument) bears the thematic role of theme. The prepositional **ka** phrase **ka pula** (through/by rain) **ka letšatši** (through the sun), **ka maru**(by cloud/through cloud) are the default arguments (D-ARG), bearing the instrument thematic role.

Sentences (3j) illustrates the occurrence of two default argument realised as the prepositional **ka** phrase (by/through), in **ka maru** (through wind) and the **le** (with) phrase, **le pula** (with rain) which express the comitative subject bearing the theme thematic role. Sentence (3i) illustrates the occurrence of two default arguments realized as prepositional **ka** phrase, **ka maru** (through clouds), **ka pula** (by rain), the occurrence of a locative complement, **bathong** (to the people) bears the thematic role of Goal.

The lexical semantic representation of tla in tla (come)

AGRSTR =	<p>AGR 1=x : inanimate(natural phenomena)</p> <p>AGR 2=y : locative goal { phys-obj inanimate }</p> <p>D-ARG1=p : natural phenomena</p> <p>D-ARG2=q : inanimate (natural phenomena)</p>
EVSTR	<p>= E₁ = e₁ : process</p> <p>E₂ = e₂ : state</p>
QUALIA	<p>= FORMAL = come (e₂, y, x, p, q)</p> <p>AGENTIVE = come-move (e₂, x, y, (p, q))</p>

4.2.4. The NP subject denotes [natural object]

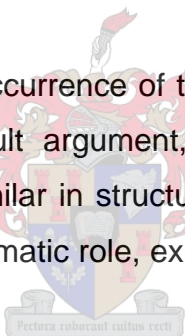
Consider the following example sentences:

4. a. Dikwata di tla setšhabeng.
(Big firewood comes to the village.)
- b. Mokgopa o tla kgorong.
(The animal skin comes to the kraal.)
- c. Lethebo le tla kgošigading.
(A gown for King/Queen comes to the Queen.)
- d. Lekgeswa le tlele morotong.
(A skin garment for men came to the mountain class)
- e. Gauta e tlele lefaseng.
(Gold came on earth.)
- f. Kuane e tla mosading le moroki.
(A hat comes to the woman with the tailor.)
- g. Tshipi e tla femeng le mošomi.
(An iron comes to the firm with a worker.)
- h. Teamane e tla lebenkeleng ka kolo.
(Diamonds come to the shop by car.)
- i. Gauta e tla lefaseng ka ramoepo.
(Gold comes on earth by the miner.)

- j. Koporo e tlile SA ka ramoepo ka sekepe.
(Copper came to SA through the miner by a boat/ship).
- k. Gauta e tlile lefaseng ka ramoepo ka mahlale a gagwe ka sefofane.
(Gold came to earth through the miner through his wisdom by an
aeroplane.)

All the sentences in (4) contain an NP subject that denotes a natural object. The sentences in (4a-c) denote the occurrence of a locative complement, ARG(ument)2, with the verb **tlā** (come) which has an NP subject Argument 1, bearing the thematic role of theme. The sentences (4d-e) illustrate the same structure, and the thematic role of theme. In sentences (4f and g) the verb **tlā** (come) takes a default argument, D-ARG, with the **le** phrase, **le moroki** (with the tailor), **le mošomi** (with worker), realized as the prepositional phrase with the preposition **le** which expresses a comitative subject bearing the agent thematic role.

Sentence (4h) demonstrates the occurrence of the default argument, the **ka** phrase, the **ka kolo**i (by car) is a default argument, D-ARG, bearing the instrumental thematic role. Sentence (4i) is similar in structure, the **ka** phrase, **ka ramoepo** (by the miner) bearing instrumental thematic role, expresses a comitative subject bearing the agent thematic role.



Sentence (4i) illustrates the occurrence of two default arguments, the **ka** phrases realised as prepositional phrase, **ka ramoepa**, expressing an agent thematic role, and **ka sekepe** (by ship) realised as instrument thematic role.

Sentence (4k) illustrates the occurrence of three default arguments, D-ARG, the **ka** phrase, realised as the prepositional phrase, **ka ramoepo** (by the miner) expressing the instrumental phrase, bearing the Agent thematic role, **ka mahlale** (through his wisdom) realised as thematic role of theme i.e gold came to S.A. by his wisdom, (if it was not for his efforts, plans, copper would not have been transported to S.A), and **ka sefofane** (by earoplane), realised as the instrument thematic role.

The lexical semantic representation of the sentences in 4

Tla (come)

AGRSTR =	$\left[\begin{array}{l} \text{AGR } 1=x : \text{ inanimate} \\ \text{AGR } 2=y : \text{ locative (goal)} \end{array} \right] \left\{ \begin{array}{l} \text{phys-obj} \\ \text{inanimate} \end{array} \right\}$	$\left[\begin{array}{l} \left[\begin{array}{l} \text{D-ARG1}=p : \text{ phys-obj} \\ \text{D-ARG2}=q : \text{ inanimate (Natural object)} \end{array} \right] \\ \text{EVSTR} \\ \left[\begin{array}{l} \text{E}_1 = e_1 : \text{ process} \\ \text{E}_2 = e_2 : \text{ state} \end{array} \right] \\ \text{QUALIA} \\ \left[\begin{array}{l} \text{FORMAL} = \text{come} (e_2, y, x, p, q) \\ \text{AGENTIVE} = \text{come-move} (e_2, x, y, (p, q)) \end{array} \right] \end{array} \right]$
	$\left[\begin{array}{l} \text{D-ARG1}=p : \text{ phys-obj} \\ \text{D-ARG2}=q : \text{ inanimate (Natural object)} \end{array} \right]$	
EVSTR	$\left[\begin{array}{l} \text{E}_1 = e_1 : \text{ process} \\ \text{E}_2 = e_2 : \text{ state} \end{array} \right]$	
QUALIA	$\left[\begin{array}{l} \text{FORMAL} = \text{come} (e_2, y, x, p, q) \\ \text{AGENTIVE} = \text{come-move} (e_2, x, y, (p, q)) \end{array} \right]$	

4.2.5 The NP subject denotes [artifact]

Consider the following example sentences:

5. a. Moropa o tla moketeng.
(The drum comes to the party.)
- b. Pitša e tla gae.
(The pot comes home.)
- c. Koloji e tlile gae.
(The car came home.)
- d. Sekepe se tlile boemakepeng.
(The ship came to the harbour.)
- e. Setimela se tla setišini le lesogana.
(The train comes to the station with a young man.)
- f. Selepe se tla kgorong le monna.
(The axe comes to the kraal with the man.)
- g. Thekisi e tlile toropong le monna.
(The taxi came to town with the man.)
- h. Katara e tlile papading le mokgalabje.
(The guitar came to the game with an old man.)

- i. Roko e tla lebenkeleng le mosetsana ka paesekela.
(The dress comes to the shop with a girl by bicycle.)
- j. Mongatse o tlile moketeng le mokgekolo ka mmotoro.
(The hat came to the party with the old lady by car.)
- k. Kefa e tla ka mmotoro le mokgekolo ka mokotla.
(The hat comes by car with the old lady by bag.)

All the sentences in (5) have an NP subject that denotes artifact. These sentences all demonstrate the occurrence of a locative complement, ARG(ument) 2, with the verb **tla** (come), which has an NP subject argument bearing the thematic role of theme. The locative complement, ARG(ument)2, bears the thematic role of goal in all the sentences.

The sentences (5e-h) demonstrate the occurrence of the default argument (D-ARG), realized as prepositional phrase with **le** (with): **le lesogana** (with the young man), **le monna**, (with the man), and **le mokgalabje** (with the old man), expressing a comitative subject bearing the thematic role of agent

The sentences (5i-j) demonstrate the occurrence of two default arguments (D-ARG) realized as the prepositional phrase, **le** phrase: **le mosetsana** (with a girl), **le mokgekolo** with the old lady) expresses a comitative subject bearing the agent thematic role. The prepositional **ka** phrase, **ka paesekela** (by bicycle), **ka mmotoro** (by car), are default arguments expressing the instrument thematic role.

Sentence (5k) demonstrates the occurrence of three default arguments (D-ARG), realised as prepositional phrases, the **ka** phrase, **ka mmotoro** (by car), expressing the instrument thematic role, **ka mokotla** (by bag) realised as an instrument-like thematic role since the bag is interpreted as an instrument used to carry the he hat, and the **le** phrase, **le mokgekolo** (with the old lady) which expresses a comitative subject bearing the agent thematic role.

The lexical semantic representation of tla in sentences in 5

tla (come)

AGRSTR =	AGR 1=x : inanimate (artifact) AGR 2=y : locative (goal) <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> $\left. \begin{array}{l} \text{phys-obj} \\ \text{inanimate} \end{array} \right\}$ </div>
EVSTR	$\left[\begin{array}{l} \text{D-ARG1=p : phys-obj} \\ \text{D-ARG2=q : inanimate (artifact)} \end{array} \right]$ = E ₁ = e ₁ : process E ₂ = e ₂ : state
QUALIA	= FORMAL = come (e ₂ , y, x, p, q) AGENTIVE = come-move (e ₂ , x, y, (p, q))

4.2.6 The NP subject denotes [food]

Consider the following example sentences:

6. a. Khekhe e tla monyanyeng.
(Cake comes to the party.)
- b. Dikgobe di tla ka moraleng.
(Porridge (made from samp and peanuts) comes to the kitchen.)
- c. Kgodu e tlile lapeng.
(Pumpkin porridge came to a (big) family)
- d. Setampa se tlile moriting.
(Samp came to the shadow.)
- e. Dimake di tla lapeng ka lesapelo.
(Peanuts comes to the family by a big dish.)
- f. Leroro le tla moraleng ka lethini.
(Sorghum comes to the kitchen by tin.)
- g. Mabele a tlile gae ka masaka.
(Maize crops came home by bags.)
- h. Magapu a tlile motseng ka teretere/terekere.
(The water melons came to the village by tractor.)
- i. Marotse a tla gae le basadi.
(Pumpkins come home with women.)

- j. Nyoba e tla baneng le monna.
(Sugarcane comes to the children with a man.)
- k. Magapu a tlile gae ka koloï le basadi ka masaka.
(Water melons came home by car with women by bags.)
- l. Dimake di tlile motseng le makgarebe ka masaka ka koloï.
(Peanuts comes to the village with ladies by bags by car.)

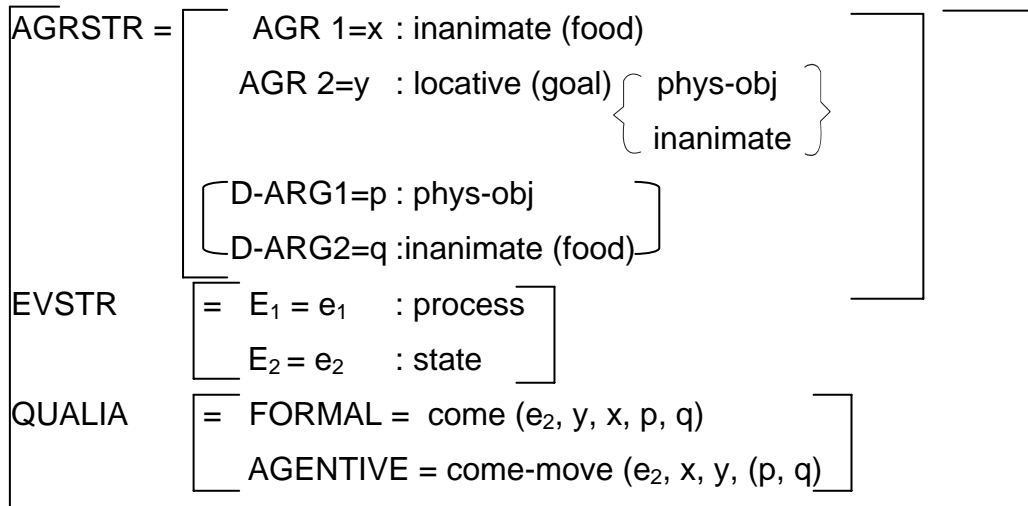
In all the sentences of (6) the NP subject ARG(ument)1, denotes food. In sentences (6a-d) the verb **tlā** (come) takes a locative complement, the NP subject argument, ARG(ument)2, **monyanyeng** (the party), **ka moraleng** (into the kitchen), **lapeng** (in family), **moriting** (to the shadow) bear the thematic role of goal.

Sentences (6e-h) illustrate the same structure and thematic role of theme, of the subject NP. The verb **tla** takes a default argument, D-ARG realised in the **ka** phrase: **ka lesapelo** (by big dish), **ka lethini** (by tin) **ka masaka** (by bags), and **ka teretere** (by tractors), realising the instrument thematic role. In sentence (6i) the verb **tla** (come) takes a locative complement, (AGR)2, bearing the thematic role of goal. The default argument (D-ARG) is realized as prepositional phrase **le** phrase, **le basadi** (with women). In sentence (6j) the verb **baneng** (to children) takes the locative complement, bearing a goal thematic role.

Sentences (6k-l) demonstrate the occurrence of three default arguments, realised as prepositional phrases, of the **ka** phrase, (by) **ka koloï** (by car), **ka masaka** (by bags), expressing the instrument thematic role, the **le** phrase, **le basadi** (with women) **le makgarebe** (with young ladies), bearing the agent thematic role.

The lexical semantic representations of tla in the sentences of 6

Tla “come”



4.2.7 The NP subject denotes [plant]

Consider the following example sentences:

7. a. Morara o tla motseng.
(Wine tree/Grape tree comes to the village.)
- b. Manko o tla lapeng.
(A mango tree comes to the family.)
- c. Mohlatswa o tlile setshabeng.
(A litchi tree came to the village.)
- d. (Morula o tlile mošate
(A Morula tree came to the headkraal.)
- e. Morara o tla lapeng ka lepokisi
(A Grape tree comes to the family by box)
- f. Moapole o tla setšhabeng ka lori.
(An Apple tree comes to the village by lorry.)
- g. Mootlwa o tla tseleng ka phefo.
(Thorns comes to the path by wind.)
- h. Mokgotle o tlile le bašemane tseleng.
(Sisal came with the boys to the path.)
- i. Moperekisi o tlile le lekgarebe motseng.
(A peach tree came with a young lady to the village.)

- j. Mopšere o tla mošate ka kolo le monna.
(A pear tree comes to the headkraal by car with a man.)
- k. Mohlatswa o tlile motseng ka lepokisi ka lori le lesogana.
(Litch three came to the village by box by lorry with a young man.)

All the sentences in (7) have a NP subject that denotes plant. The sentences (7a-d) demonstrate the occurrence of a locative complement, ARG(ument)₂, with the verb **tla** (come) which has an NP subject argument, ARG(ument)₁, bearing the thematic role of theme. The sentences (7e-g) illustrate the occurrence of the default argument, realized as a prepositional **ka** phrase; **ka lepokisi** (by box), **ka lori** (by lorry), and **ka phefo** (by wind), are default arguments (D-ARG) bearing the instrumental thematic role, interpreted as the instrument argument, through which **mootlwa** (thorn) is brought/carried to the path.

In sentences (7h-i) similar arguments are demonstrated. The prepositional **le** phrase, **le bašemane** (with boys), and **le lekgarebe** (with a young lady) express the comitative subject bearing the thematic role of agent, while (7j) illustrates the occurrence of the verb **tla** (come) which takes a locative (goal) complement, and the occurrence of two default arguments (D-ARG), realised as prepositional **ka** phrase, **ka kolo** (by car) bearing the instrumental thematic role, and the **le** phrase, **le monna** (with a man) express the comitative subject bearing the agent thematic role.

In sentences (7k) illustrates the occurrence of three default argument, realized as prepositional, **ka** phrase: **ka lepokisi** (by box) **ka lori** (by lorry) bearing the thematic role of instrument, and the prepositional **le** phrase **le lesogana** (with a young man) express a comitative subject bearing the thematic role of agent like argument.

The lexical semantic representation of tla in sentence 7

tla (come)

AGRSTR =	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> AGR 1=x : inanimate (plant) AGR 2=y : locative (goal) <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> $\left. \begin{array}{l} \text{phys-obj} \\ \text{inanimate} \end{array} \right\}$ </div> </div>
	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-left: 20px;"> D-ARG1=p : phys-obj D-ARG2=q : inanimate (plant) </div>
EVSTR	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> = E₁ = e₁ : process E₂ = e₂ : state </div>
QUALIA	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> = FORMAL = come (e₂, y, x, p, q) AGENTIVE = come-move (e₂, x, y, (p, q)) </div>

4.2.8. The NP subject denotes [action]

Consider the following example sentences:

8. a. Mapantsola a tla sinema.
(A dance for young children comes to cinema.)
- b. Modiro o tla bašoming.
(Work comes to the workers.)
- c. Mošomo o tlile baneng.
(Work came to the children.)
- d. Molaetša o tlile setšhabeng.
(Massage came to the community.)
- e. Maikarabelo a tla mofahlošing ka Moprofesa.
(Responsibility comes to the lecturer by Prof.)
- f. Maetekelo a tla morutišing ka morutwana.
(The efforts come to the teacher by a learner.)
- g. Mafolofolo a tlile barutwaneng ka mofahloši.
(Activeness came to the learners through the educator.)
- h. Botšwa bo tlile baneng ka komputara.
(Laziness came to children by a computer.)

- i. Komputara e tla le ramahlale baneng.
(Computer comes with a scientist to the learners.)
- j. Bokebekwa bo tla le “television” baneng.
(Crime comes with television to the children.)
(i.e. they learn technics from it)
- k. Maetekelo a tlile kgole ka dipampiri le Mopresitent.
(The efforts came far through papers with the president.)

All the sentences in (8) have the NP subject that denotes action. In sentence (8a) the verb tla (come) takes a locative complement, ARG(ument)2, and the NP subject argument, ARG(ument)1, bears the thematic role of theme. The sentences (8a-c) illustrate a similar structure: In (8a), the NP subject argument, ARG(ument) 1 bears the thematic role of Theme, and the locative arguments bašoming (to workers), baneng (to children),. Setšhabeng (to the community) bear the thematic role of goal.

In sentences (8e-h) the verb **tla** (come) takes a locative complement, i.e. the NP subject **mofahlošing** (to the lecturer), **morutišing** (teacher) **barutwaneng** (to learners), and **baneng** (to children). The NP argument, ARG(ument) 1 bears the thematic role of agent. The sentences demonstrate the occurrence of the default argument (D-ARG) realized as prepositional phrase **ka** (by), characteristically the instrumental preposition, i.e. **ka Moprofesa** (by the Professor), **ka morutwana** (by a learner), **ka mofahloši**_(through/by the educator), and **ka komputara** (by a computer).

In sentences (8i and j) similar structures are demonstrated, with two default arguments. The occurrence of the default argument, the prepositional phrase **le** (with) phrase introduces an agent argument, **le ramahlale** (with a scientist), **le television** (by television). The sentence (8k) demonstrate the occurrence of the default argument (D-ARG) with the prepositional **ka** phrase, **ka dipampiri** (through/by papers), which bears the instrumental thematic role, and the prepositional phrase wiht **le Mopresitente** (with the President).

The lexical semantic representation of “tla” of the sentences in 8

Tla (come)

AGRSTR =	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> AGR 1=x abstract state AGR 2=y : locative (goal) </div> <div style="font-size: 2em; margin-right: 10px;">}</div> <div style="font-size: 2em; margin-right: 10px;">}</div> <div style="font-size: 2em; margin-right: 10px;">}</div> </div>
	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> D-ARG1=p : abstract-obj D-ARG2=q : inanimate (action) </div> </div>
EVSTR	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> = E1 = e₁ : process E2 = e₂ : state </div> </div>
QUALIA	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> = FORMAL = come (e₂, y, x, (p, q)) AGENTIVE = come-move (e₂, x, y, (p, q)) </div> </div>

4.2.9 The NP subject denotes [event]

Consider the following example sentences:

9. a. Khirikhethe e tla bathong.
(Cricket comes to the people.)
- b. Papadi e tla South Africa
(Game comes to South Africa)
- c. Kgwele ya maoto e tlile basading.
(Soccer came to ladies (i.e introduced to ladies.)
- d. Monyanya o tlile bathong.
(Party came to people (i.e to people who appreciated).
- e. Kgwelentlatlana e tla basetsaneng ka mokapotene.
(Netball comes to girls by the captain.)
- f. Hlompho e tla setšhabeng ka moetapele.
(Respect comes to the community through the leader/by the leader.)
- g. Lenyatšo le tlile motseng ka kgoši.
(Disrespect came to the village through the chief.)
- h. Kgahlego lapeng e tlile ka bana.
(Attraction came to the family through the children.)
- i. Hlompho ka lapeng e tla le bana ka maitshwaro.
(Respect to the family comes through children through behaviour.)

- j. Thogako lapeng e tlile le monna ka botagwa ka go sepela bošego.
(Insult to the family came with the man through intoxication by walking at night.)

All the sentences in (9) have an NP subject that denotes an event. In sentences (9a-d) the verb **tla** (come) takes a locative complement ARG(ument)2, the NP **bathong** (to the people) in (9a and d), **South Africa**, and **basading_**(to ladies). The NP subject argument ARG(ument)1 in the sentences of (9) bear the thematic role of theme. The locative complement, ARG(ument) 2 bears the thematic role of goal.

The sentences in (9e-h) demonstrate the occurrence of a default arguments (D-ARG), syntactically realised as prepositional phrases with **ka**, characteristically the instrumental preposition, which introduces an agent-like argument. In sentence (1e) the locative NP argument of **tla** (come) denotes a goal argument, ARG(ument) 2, with the prepositional **ka** phrases **ka mokapotene** (by the captain) bearing the agent-like argument, i.e. **mokapotene** (the captain) is interpreted as the agent argument through which netball came to girls. Sentence (9f, 1g and h) demonstrate similar properties to (9e).

The NP subject argument, ARG1, is the theme, while the locative argument, ARG2, **basetsaneng** (to girls), **setšhabeng_** (to the community) **motseng** (to village), and **lapeng** (to the family) is a goal argument. The prepositional phrase **ka kgoši** (through the chief) is an agent-like argument since the chief is interpreted as the person who brought respect to the village. In sentence (9g) the chief is interpreted as the person who brought disrespect to the village. In sentences (9e,f and g), the prepositional **ka bana** (through children), a default argument (D-ARG) bearing an agent-like argument in which the children are interpreted as people who brought attraction to the family.

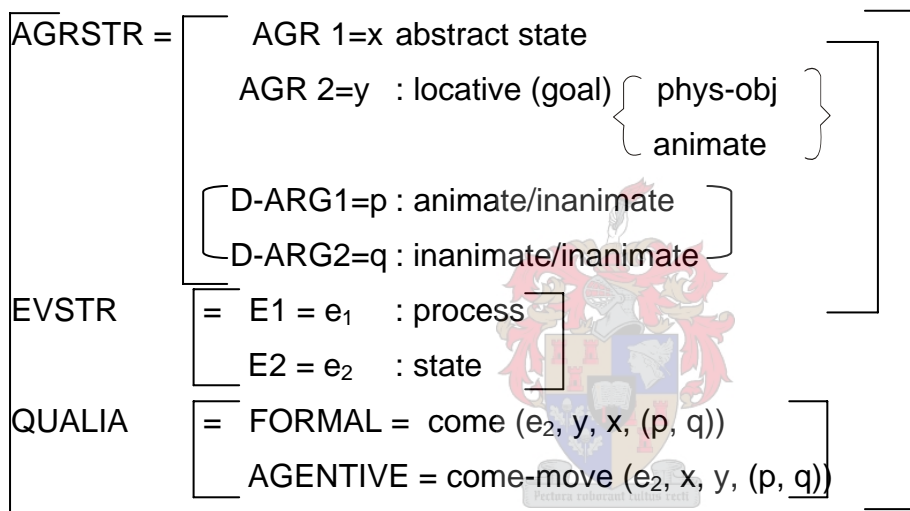
Sentences (9i and j) demonstrate the occurrence of defaults argument (D-ARG), expressed by the prepositional phrase **ka lapeng** (in the family) which bears the instrument-like thematic role, while **ka maitshwaro** (through behaviour) also bears an instrumental thematic role. The other prepositional phrase **le bana** (with children)

is interpreted as an agent-like argument, since the children are interpreted as people who brought respect to the family.

In sentence (9j) similar properties are demonstrated to (9i) **ka botagwa** (through intoxication), **ka go sepela bošego** (by walking at night) are instrument-like thematic role, and **le monna** (with the man) is an agent-like argument.

The lexical semantic representation of “tla” in sentences of 9

Tla (come)



4.2.10 The NP subject denotes [state]

Consider the following example sentences:

10. a. Bohlale bo tla setšhabeng.
(Wisdom comes to the community.)
- b. Tsebo e tla bathong.
(Knowledge comes to the people.)
- c. Bošega bo tlike lefaseng.
(Fear came to people, or Fear came to earth))
- d. Botagwa bo tlike lefaseng.
(Intoxication came to the earth.)
- e. Hlompho e tla mothong ka maitshwaro.
(Respect comes to a person through behaviour.)

- f. Lenyatšo le tla mosading ka mekgwa/mediro.
(Disrespect comes to a woman through doings/deeds.)
- g. Bohodu bo tlile lefaseng ka hlokego ya mešomo.
(Crime came to earth by unemployment.)
- h. Bokebekwa bo tlile ka dithunya motseng.
(Crime came through guns to the community.)
- i. Bohodu bo tla le batswantle motseng.
(Theft comes with foreigners to the community.)
- j. Bohlale bo tla le ramahlale setšhabeng.
(Wisdom comes through the scientist to the people.)
- k. Tsebo e tla le ramahlale ka komputara lefaseng.
(Knowledge comes with a scientist by a computer to the people.)

All the sentences in (10) have an NP subject that denotes state. The occurrence of a locative complement, ARG(ument) 2, with the verb **tla** (come) demonstrates an ARG(ument) bearing the thematic role of goal. In sentences (10a-d), the verb **tla** (come) takes a locative complement only, the NP **setšhabeng** (to the community), **bathong** (to the people) **lefaseng** (on earth).

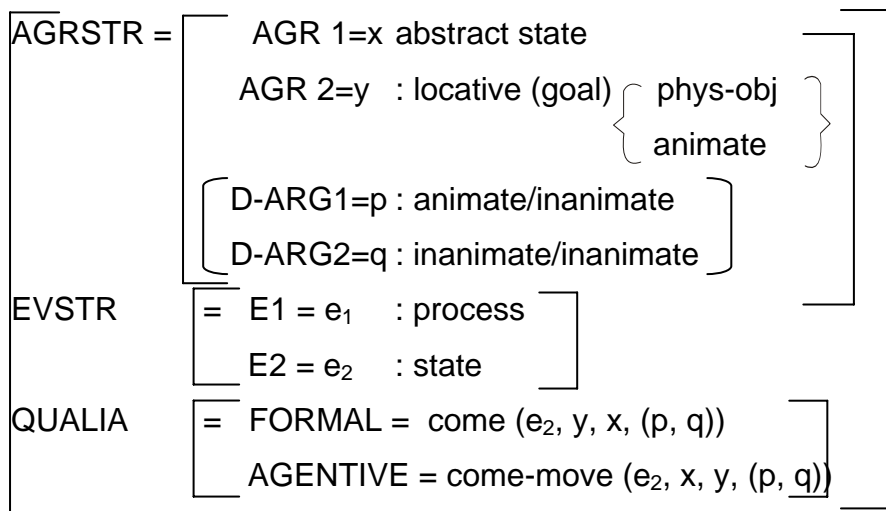
Sentences (10e-h) demonstrate the occurrence of the default argument (D-ARG) which are syntactically realised as prepositional phrase **ka** phrase, i.e. **ka maitšhwaro** (through behaviour), **ka mekgwa** (through deeds/doings), **ka hlokego** (by unemployment), **ka dithunya** (by guns) realised as instrumental thematic role.

Sentences (10i-j) demonstrate similar properties with the default argument (D-ARG), syntactically realised as a prepositional phrases with the **le** (with/together with) phrases, **le batswantle** (with foreigners), and **le ramahlale** (through the scientist), bearing the thematic role of agent.

Sentence (10k) demonstrates the occurrence of two default argument (D-ARG), with the prepositional phrase **le** phrase, **le ramahlale** (with a scientist) and the **ka** phrase, **ka komputara** (by a computer) bearing the instrumental thematic role.

The lexical semantic representation of “tla” in sentences of 10

Tla (come)



4.2.11. The NP subject denotes [illness]

Consider the following example sentences:

11. a. Dišo di tla diphoofolong.
(Rash come to the animals.)
- b. Sekaku se tla letsweleng.
(The abcess comes to the breast.)
- c. Seokelela se tlele ngwaneng.
(A hiccup came to the child.)
- d. Mooko o tlele leseeng/ngwaneng.
(Measles came to the newborn child.)
- e. Kauto e tla banneng ka nama.
(Goute comes to men by/through meat.)
- f. T.B e tla banneng ka motsoko/lefolo.
(Tuberculosis comes to men through cigarettes.)
- g. Kankere ya maswafo e tla mothong ka motsoko.
(Lung cancer comes to a person by cigarettes.)
- h. Lekhwekhwe le tla le ditswene bathong.
(Skin rash comes with baboons to people.)
- i. Lephera le tla le dikolobe baneng.
(Epilepsy comes with pigs to the children.)

- j. Sethehu se tlile le dikgogo motseng.
(Hick-up came with chickens to the village.)
- k. Manga a tlile mothong le phefo.
(Heal cracks came to a person with cold.)

The sentences in (11) have an NP subject that denotes illness. The verb **tla** (come) takes a locative complement, ARG(ument)₂, i.e. the NP **diphoofolong** (to animals) **letsweleng** (to the breast), **ngwaneng** (to the child) **leseeng** (to the newborn child). All the NP subject arguments, ARG(ument)₁ bear the thematic role of theme.

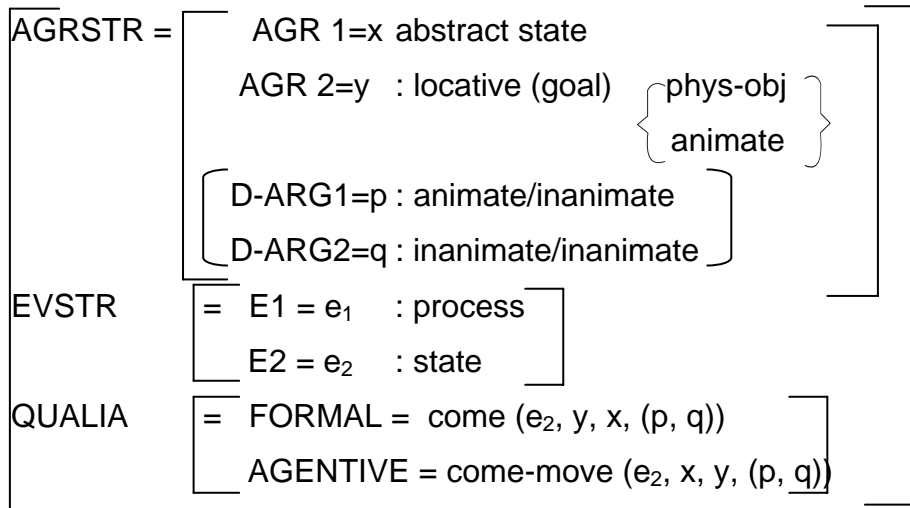
The sentences (11e-g) demonstrate the occurrence of default argument (D-ARG) syntactically realised as prepositional phrase with the **ka** phrase, which characteristically bears the instrumental thematic role. In all the sentences the locative NP argument of **tla** “come” denotes goal argument.

The sentences (11e-g) illustrate the occurrence of the default (D-ARG), expressed by the prepositional **ka** phrases **ka nama** (through/by meat), and **ka motsoko** (through cigarettes).

The sentences (11h-k) demonstrate the occurrence of the (D-ARG), syntactically realised as a prepositional **le** phrase, **le ditswene** (with baboons), **le dikolobe** (with pigs), **le dikgogo** (with chickens), and **le phefo** (with wind) realised as abstract instrumental adjunct.

The lexical semantic representation of “tla” in sentences of 11.

Tla (come)



4.2.12 The NP subject deontes [culture]

Consider the following example sentences:

12. a. Moila o tla bathong
(Taboo comes to the people.)
- b. Ngwale o tla mošate.
(A girl who is at circumcission comes to the headkraal.)
- c. Dipheko di tlile bathong.
(Ritual bones came to the people.)
- d. Bagwera ba tlile monyeneng.
(Friends came to the party)
- e. Thuto e tlile le diphetogo setšhabeng.
(Education came with changes to the people.)
- f. Kgoro e tlile le diphetogo le molaosetšhabeng.
(The department came with a changes and principles to the community)
- g. Kotlo e tla mošemaneng ka molaotheo.
(Penalty comes to the boy by/through the constitution.)
- h. Kgodišo e tla ka motswadi ngwaneng.
(Up-bringing comes through the parent to the child.)
- i. Hlompho e tlile motswading ka ngwana.
(Respect came to the parent through the child.)

- j. Hlatlošo e tlile ka dithuto mofahlosing.
(Promotion came through education to the lecturer.)(Promotion to the lecturer came through education)
- k. Setšo se tla le batho ka dipuku ka go bala sekolong.
(Culture comes with people through books by reading to school.)

The sentences in (12) have an NP subject that denotes culture. In sentences (12a-d) the verb **tla** (come) takes a locative complement, ARG(ument)2, expressing the goal argument: the NP **bathong** (to people), **mošate** (to headkraal), and **monyanyeng** (to the party), the NP subject, ARG(ument) 1, in sentences of (12) bears the thematic role of theme. The locative complement ARG (ument) 2 bears the thematic role of goal.

The sentences (12e-j) demonstrate the occurrence of the default argument (D-ARG) which is syntactically realised as a prepositional phrase with the **le** phrase (with/together with). In sentences (12e and f), **le diphetogo** (with changes), **le molao** (with principles) bear an abstract instrumental thematic role. Sentence (12g-j) demonstrate the occurrence of the default argument (D-ARG) realised as a prepositional phrase with the preposition **ka** (by/through) i.e. **ka molatheo** (by constitution), **ka motswadi** (through the parent), and **ka dithuto** (through education) characteristically realised as an agent-like argument. In sentences (12h and i) the prepositional phrases bear an abstract instrument thematic role(12g&j).

Sentence (12k) demonstrates the occurrence of two default arguments, realised as a prepositional phrase **le batho** (with people), and the prepositional **ka phrase, ka go bala** (by reading/through books) bearing the abstract instrumental thematic role.

The lexical semantic representation of “tla” in sentences of 12

Tla (come)

AGRSTR =	AGR 1=x abstract state AGR 2=y : locative (goal)	{ phys-obj animate }
	D-ARG1=p : phys-obj D-ARG2=q : inanimate (culture)	
EVSTR	= E1 = e ₁ : process E2 = e ₂ : state	
QUALIA	= FORMAL = come (e ₂ , y, x, (p, q)) AGENTIVE = come-move (e ₂ , x, y, (p, q))	

4.2.13. The NP subject denotes [communication]

Consider the following example sentences:

13. a. Kwišišano e tla mafelelong.
(The understanding is coming to an end.)
- b. Diphetogo di tla ngwaneng.
(Changes are coming to the child.)
- c. Dipoledišano di tlele baraloking.
(Discussions came to the players.)
- d. Dipheko di tlele mošate.
(Ritual bones came to the headkraal.)
- e. Diphaso di tlele dirapeng ka rakgadi.
(Rituals came to the cemeteries by the aunt.)
- f. Kgalemo e tla baneng ka papa.
(Discipline comes to the children through the father/ by the father.)
- g. Diema di tla setšhabeng ka batsibi.
(Proverbs come to the people by experts.)
- h. Seka se tlele ka seboledi monyanyeng.
(The idiom came with the speaker to the party.)
- i. Phetho e tlele ka modulasetulo kopanong.
(Conclusion came by the chairperson at the meeting.)

- j. Kgalemo e tla ka kgoši setšhabeng ka mokgomana.
(Discipline come by the king to the people through the headman.)

All the sentences in (13) have an NP subject, ARG(ument)1, that denotes communication. In all the sentences of (13) the verb **tla** (come) takes a locative complement ARG(ument)2, the NP **mafelelong** (to the end), **ngwaneng** (to the child) **baraloking** (to the players), and **mošate** (to the headkraal). All the NP subject arguments, ARG(ument) 1 in the sentences of 1 bear the thematic role of theme.

The locative complement ARG(ument) 2 bears the thematic role of goal. The sentences (13e-h) demonstrate the occurrence of the default argument (D-ARG) syntactically realised as prepositional phrase with **ka**, characteristically the instrumental preposition. The locative NP argument of **tla** (come) denotes a human goal argument, ARG(ument) 2, while the prepositional phrase **ka** phrase **ka rakgadi** (by aunt), **ka papa** (by the father), **ka batsibi** (by experts), **ka seboledi** (by the speaker), and **ka modulasetulo** (by the chairperson) are realised as the agent-like argument since they are interpreted as agent argument through which **diphaso** (rituals), **kgalemo** (discipline) **diema** (proverbs), **seka** (idiom), **phetho** (conclusion) **kgalemo** (discipline) were brought forth to **dirapeng** (to cemeteries) in (13e).



The prepositional phrase **ka rakgadi** (by aunt) is interpreted as an instrument/agent-like argument, i.e. **setšhabeng** (to people) **monyanyeng** (to the party), and **kopanong** (to the meeting) are understood by having brought to the people by **rakgadi** (aunt) as an agent-like argument or instrumental thematic role.

Sentence (13i) demonstrates the occurrence of two default arguments (D-ARG) bearing the instrumental thematic role, **ka kgoši** (by the king) and **ka mokgamana** (through the headman) realised as prepositional phrase **ka** phrase, bears the instrument thematic role.

The lexical semantic representation of “tla” in sentences of 13

Tla (come)

AGRSTR =	<p>AGR 1=x abstract state</p> <p>AGR 2=y : locative (goal) $\left\{ \begin{array}{l} \text{phys-obj} \\ \text{animate} \end{array} \right\}$</p> <p>$\left[\begin{array}{l} \text{D-ARG1=p : phys-obj} \\ \text{D-ARG2=q : inanimate (communication)} \end{array} \right]$</p>
EVSTR	<p>= E1 = e₁ : process</p> <p>E2 = e₂ : state</p>
QUALIA	<p>= FORMAL = come (e₂, x, y, p, q)</p> <p>AGENTIVE = come-move (e₂, y x (p, q))</p>

4.2.14 The NP subject denotes [cognition]

Consider the following example sentences:

14. a. Maikarabelo a tla bathong.
(Responsibilities come to the people.)
- b. Tsebo e tla baithuting.
(Knowledge comes to the learners.)
- c. Molao o tlele baetapeleng
(The law came to the leaders.)
- d. Hlompho e tlele morutišing.
(Recognition came to the educator.)
- e. Tlotlo e tla morutwaneng ka hlogo ya sekolo.
(Praise comes to the learner by/through the principal.)
- f. Hlohleletšo e tla ngwaneng ka mmagwe.
(Courage comes to the child through the mother/by the mother.)
- g. Tsebo e tlele bothong ka go bala.
(Knowledge came to the people by reading/through reading.)
- h. Boroko bo tlele mothong ka go lapa.
(Sleepiness came to a person through tiredness.)
- i. Bohlale bo tla ka ramahlale ka “tekenology” bathong.
(Intelligence comes through the scientist through/by technology to the people.)

All the sentences in (14) have an NP subject that denotes cognition. The verb **tla** “come” takes a locative complement, ARG(ument)2, the NP **bathong** (to people) **baithuting** (to learners) **baetapeleng** (to the leaders), and **moturišing** (to the educator). The NP subject argument, ARG(ument) 1 bears the thematic role of theme in all the sentences of (14). The locative complements, ARG(ument) 2, bear the thematic role of goal.

The sentences (14e-i) demonstrate the occurrence of the default argument (D-ARG) syntactically realised as a prepositional phrase with the instrumental preposition **ka**, characteristically, the instrumental preposition. The prepositional argument of **tla** (come), the prepositional phrase **ka** phrase, **ka mmagwe** (by her mother), and **ka go bala** (by reading/through reading) realises as an agent-like argument. Similarly, in sentences (14h and i) the prepositional phrases realise the abstract instrument/agent-like thematic role.

Sentence (14j) demonstrates the occurrence of two default arguments (D-ARG), syntactically realised as a prepositional phrase with **ka**, characteristically the instrumental preposition, i.e. **ka ramahlale** (through the scientist), realised as an agent-like argument, and **ka tekenolotši** (through technology) realised as abstract thematic role.

The lexical semantic representation of “tla” in the sentences of 14

Tla (come)

AGRSTR =	AGR 1=x abstract state AGR 2=y : locative (goal)	phys-obj animate
	D-ARG1=p : phys-obj D-ARG2=q : inanimate (cognition)	
EVSTR	= E1 = e ₁ = process E2 = e ₂ = state	
QUALIA	= FORMAL = come (e ₂ , x, y, p, q) AGENTIVE = come-move (e ₂ , y x (p, q))	

4.2.15. The NP subject denotes [feeling]

Consider the following example sentences:

15. a. Kwelobohloko e tla mothong.
(Feeling of sympathy comes to a person.)
- b. Tumo e tla ngwaneng.
(Desire comes to the child.)
- c. Lehloyo le tlile lekgarebeng.
(Hate came to a young lady.)
- d. Toka e tlile bathong.
(Truth and reconciliation came to people.)
- e. Khutšo e tla motseng ka moetapele.
(Peace comes to the community by/through the leader.)
- f. Merusu e tla ngwaneng ka bagwera.
(Unrest comes to the child by friend/through friends.)
- g. Tlhompho e tlile lapeng ka makgarebe.
(Respect came to the family by young ladies.)

All the sentences in (15) have an NP subject that denotes feeling. The sentences show the verb **tla** (come) taking a locative complement, ARG(ument)2. The sentences (15a-d) take a locative complement only, **mothong** (to a person), **ngwaneng** (to a child), **lekgarebeng** (to young lady), and **bathong** (to the people). The NP subject argument, ARG(ument) 1 in (15a-d) bear the thematic role of agent. The locative complement ARG(ument) 2 bear the thematic role of goal.

Sentences (15e-g) demonstrate the occurrence of the default argument (D-ARG), syntactically realised as a prepositional phrases with **ka** which characteristically expresses, the instrumental preposition. The locative NP argument of **tla** (come) denotes a prepositional phrase **ka** phrase: **ka moetapele** (by the leader), **ka bagwera** (by friends/through friends), and **ka makgarebe** (by young ladies), realised as an agent-like argument through which **khutšo** (peace) come, **merusu** (unrest) came into being.

The lexical semantic representation of tla in sentences 15

AGRSTR =	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> <p>AGR 1=x abstract state</p> <p>AGR 2=y : locative (goal)</p> </div> <div style="width: 35%; text-align: center;"> <p>{ phys-obj }</p> <p>{ animate }</p> </div> </div>
	<div style="border-left: 1px solid black; border-right: 1px solid black; padding: 5px;"> <p>D-ARG1=p : phys-obj</p> <p>D-ARG2=q : inanimate (cognition)</p> </div>
EVSTR	<div style="border-left: 1px solid black; border-right: 1px solid black; padding: 5px;"> <p>= E1 = e₁ = process</p> <p>E2 = e₂ = state</p> </div>
QUALIA	<div style="border-left: 1px solid black; border-right: 1px solid black; padding: 5px;"> <p>= FORMAL = come (e₂, x, y, p, q)</p> <p>AGENTIVE = come-move (e₂, y x (p, q))</p> </div>

4.3 SUMMARY

This chapter explored the polysemy of the verb **tla** (come) as a motion verb. It involves the movement of objects or even human beings in different ways, expressed by prepositional phrases with the associative preposition **le** and the instrumental preposition **ka**.

The example sentences given throughout the chapter demonstrated the occurrence of locative complement ARG(ument)2, with the verb **tla** (come) with an NP subject argument which has the thematic role of Agent or Theme. It was shown in a range of examples that the default argument, D-ARG with the preposition **ka** (with/by) realises an instrument thematic role e.g.

(a) Basadi ba ile monyanyeng ka koloi.

The women went to the wedding by/with a car.

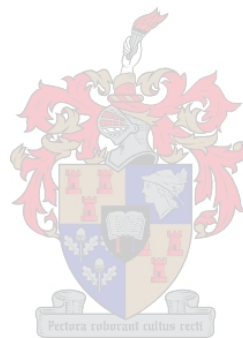
It was demonstrated in this chapter that some sentences illustrated the occurrences of two default arguments, realised as a prepositional **le** phrase, which expresses a comitative subject, bearing the agent thematic role, and the preposition **ka** phrase as default argument realising the instrument thematic role e.g.

Ramahlale o ya mosetsa ka sefofane le Mopresidesnte ka dithuto.

The Scientist goes to abroad by aeroplane with the President through education studies.

The lexical semantic representations of sentences with **tla** (come) in the sentences examined were presented for each set.

The polysemous behavior of the motion verb **tla** is given by the whole verb constellation, i.e. the subject argument, as well as the verb complements. the chapter has demonstrated that the prepositions **le** (with/together with) and **ka** (by means of/through) can introduce an instrument argument or an agent-like argument.



CHAPTER 5

CONCLUSION

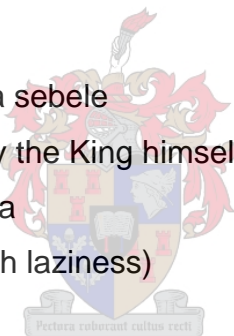
This study examined the polysemous behavior of the motion verbs **–ya** (go), and **tla** (come) in Northern Sotho (Sepedi), employing the theoretical framework developed by Pustejovsky (1996), known as Generative Lexicon Theory (GLT). This theory is centrally concerned with account for the polysemy of words, alone and in combination, in order to account for word sense distinctions. The study set out to explore, in particular, how word sense distinctions of the verbs **ya** and **tla** arise as a result of its occurrence in particular verb constellations, i.e., subject and verbal complement categories.

Chapter Two of the study gave a comprehensive review of the framework of Generative Lexicon Theory. Extensive discussion was devoted to the four levels of prepresentation in the Generative Lexicon Theory model, i.e. Argument structure, Event structure, Qualia structure and Lexical Inheritance structure. Discussion was also devoted to the four-fold analysis of Qualia structure in terms of the features FORMAL, CONSTITUTIVE, TELIC, and AGENTIVE.

In Chapter Three the polysemy of the verb **ya** (go) was examined in different sentence constructions. The verb **ya** (go) as motion verb can be associated with the occurrence of a locative complement, the goal argument. It was also shown that the verb **ya** (go) can have NP subject argument that can bear the thematic role of **agent**. The verb **ya** (go) can take a default argument realized as the preposition phrase with the preposition **ka**, realising the instrument thematic role. In some cases two default arguments can be realized, through the prepositional phrase with **le** (with) which can express a comitative subject bearing the agent thematic role and the prepositional phrase with **ka** (by means of).

1. Mosadi o ya nokeng.
(The woman is going to the river)

2. Ditau di ile mošetša ka sekepe
(Lions went to abroad by ship)
3. Meetse a ya motseng ka lori
(Water go to the community by car)
4. Moropa o ile moketeng
(A drum went to the party)
5. Mabele a ya lešaleng le basadi ka lori ka masaka
(Maize crops went to the maize building with women by lorry by bags)
6. Morara o ile bathong ka makgowa ka mabotlelo
(Wine went to people through/by Western people by bottles)
7. Maikarabelo a ile moprofeseng
(Responsibility went to the Professor)
8. Papadi e ya mafelelong
(The game is going to the end)
9. Tsholo e ile banneng ka kgoši ka sebele
(Blame went/came to the men by the King himself)
10. Sekaku se ile mothong ka botšwa
(Absess went to a person through laziness)
11. Tlhago e ya le mabaka
(Culture goes with time/circumstances)
12. Papadi ya Tshipu e ya bathong
(The play Tshipu goes to the people or, The play for Tshipu goes to the people)
13. Maikarabelo a ya motswading
(Responsibility goes to the parent)
14. Phufulelo/pefelo e ile bathong ba bolaya ka sekgame
(Anger went to the people and they killed)



The structural representation of the lexical semantics of the sentences given above was presented in chapter three.

Chapter Four examined the polysemous behavior of the verb **tla** (come). The verb **tla** (come) is a motion verb that can be realized with the occurrence of a locative complement argument. The verb **tla** (come) can have an NP subject argument that bear the thematic role of **agent**. The verb **tla** (come) can denote a default argument realized as an agent-like argument in the prepositional **le** phrase and the instrument argument in the prepositional **ka** phrase.

In some cases two or three default arguments can be realized, the prepositional **le** (with) which can express a comitative subject bearing the agent thematic role and of instrument thematic role. In some circumstances a sentence may be ambiguous.

Example sentences are given below from the NP subject types examined in chapter four.

15. Mosetsana o tla sekolong

(A girl comes to school)

16. Ditau di tlile motseng

(Lions came to the village)

17. Leretha le tla motseng ka moya

(Dust come to the village through/by wind)

18. Phefo e tla lefaseng ka maru le pula

(Cold come on earth through/by cloud and/with rain)

19. Tshipi e tla femeng le mošomi

(Iron comes to the firm wit/through the worker)

20. Kepa e tla ka mmotoro le mokgekolo ka mokotla

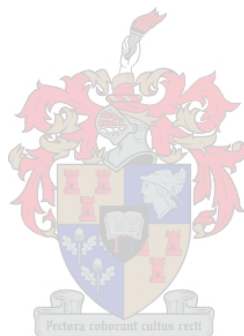
(A hat comes by car with the old lady by bag)

21. Mabele a tlile gae ka masaka

(Maize crops came home by bags)

22. Mohlatswa o tlile motseng ka lepokisi ka lori le lesogana

(Litchi tree came to the village by box by lorry with a young man)



23. Komputara e tla le ramahlale baneng
(Computer comes with a scientist to the learners)
24. Hlompho ka lapeng e tla le bana ka maitsharo
(Respect into the family comes through children through behaviour)
25. Tsebo e tla le ramahlale ka komputara leпасeng
(Knowledge come with a scientist by a computer to the people)
26. Sekaku se tla letsweleng
(Abcess come to the breast)
27. Kgoro e tlile le diphetogo setshabeng
(The department came with changes to the people)
28. Phetho e tlile ka modulasetulo kopanong
(Conclusion came through/by the chairperson to the meeting)
29. Tlotlo e tla morutwaneng ka hlogo ya sekolo
(Praise comes to the learner by the principal)
30. Lehloyo le tlile lekgarebeng
(Matress came to the young lady)

The study demonstrated that the verbs **ya** and **tla** are polysemous in terms of their occurrence in a range of verb constellations.

The semantic selection properties of subject and complements can be an indicator of the syntactic behaviour of lexical item. The broader the selection possibilities for a verb the more general are the semantic type associated with the complement. This was comprehensively demonstrated by the investigation conducted in this study.

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