Université de Montréal

The Role of Aspect in Paraphrase Operations

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Mémoire présenté à la Faculté des études supérieures
en vue de l'obtention du grade de
Maîtrise
en linguistique

Avril, 2005

Page d'identification du jury

Université de Montréal
Faculté des études supérieures

Ce mémoire intitulé :

The Role of Aspect in Paraphrase Operations

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a été évalué par un jury compose des personnes suivantes:

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Mémoire accepté le : 26 septembre 2005

Résumé

Modéliser le sens en établissant des règles de paraphrasage de manière que l'on puisse prédire quand l'application d'une règle paraphrastique à une phrase arbitraire résultera en une paraphrase acceptable est essentiel en la maximisation de l'utilité de la paraphrase en l'étude sémantique et en linguistique computationnelle. Dans ce mémoire, nous proposons de contribuer à cette modélisation d'un nouveau point de départ. Nous avons appliqué de manière aveugle une règle paraphrastique déjà établie à un corpus de phrases en anglais défini pour ensuite analyser les résultats non acceptables de ce test. En particulier, nous menons une étude sur la problématique de l'opération paraphrastique qui transforme le verbe du syntagme verbal comportant la tête syntaxique d'une phrase donnée en un verbe support suivi d'une nominalisation du verbe original.

L'analyse des phrases résultantes de cette opération paraphrastique, les paraphrases proposées, a été menée avec l'hypothèse que l'aspect linguistique joue un rôle signifiant dans l'explication de la non acceptabilité de certaines paraphrases obtenues. En effet, plusieurs paraphrases non acceptables qui résultent de cette opération paraphrastique ne sont pas acceptables car elles changent le sens aspectuel de la phrase originale. De plus, nous avons trouvé que la non acceptabilité des autres paraphrases s'explique par la présence des autres propriétés phrastiques syntactique et sémantique. Au total, onze catégories de propriétés des phrases ont été détectées et distinguées à l'analyse des paraphrases non acceptables, parmi lesquels le besoin d'un sujet grammatical animé, des problèmes d'une modification de la portée de l'action dénotée par le verbe en question par rapport au sujet grammatical et les structures cachées elliptiques.

Mots clés

Aspect, linguistique théorique, fonction lexicale, nominalisation, paraphrase, sémantique, verbe support.

Abstract

The modelling of meaning by the establishment of paraphrase rules in such a way that one is able to predict when the application of a paraphrase rule to any arbitrary sentence will produce acceptable results is essential if one wants to maximise the usefulness of the paraphrase in semantics and computational linguistics. In this thesis, we propose to contribute towards this modelling from a new angle. We carried out the blind application of a well-recognised paraphrase rule to a defined corpus of sentences in English in order to then analyse the results of this test. In particular, we carried out a study of the problematic surrounding the paraphrastic operation that transforms a verb of a verb constellation into a support verb followed by a nominalisation of the original verb.

The analysis of the resulting sentences of this paraphrase operation, the attempted paraphrases, was carried out with the hypothesis that linguistic aspect plays a significant role in the explanation of the unacceptability of some unacceptable paraphrases. Indeed, many unacceptable paraphrases resulting from this paraphrase operation are not acceptable because they change the aspectual meaning denoted by the original sentence. In addition, we have found that the unacceptability of other sentences may be explained by the presence of other sentential syntactic or semantic properties. In total, eleven categories of these properties have been detected and distinguished throughout this analysis of unacceptable paraphrases, among which are the requirement of animacy of the grammatical subject, the altering of the scope of action with relation to the grammatical subject, and hidden elliptical structures.

Key words

Aspect, lexical function, nominalisation, paraphrase, semantics, support verb, light verb, theoretical linguistics.

Remerciements

Ce mémoire a été dirigé par Richard Kittredge. Je voudrais lui exprimer ma profonde gratitude pour les nombreuses heures qu'il a passées à lire et relire mes résultats et le corps du mémoire, ainsi que pour les conseils fort incomparables qu'il m'a donnés durant tout le processus.

Je voudrais également remercier le Centre d'études allemandes et européennes dont j'ai reçu une bourse de recherche.

Je remercie les membres du jury, Igor Mel'čuk et Nathan Ménard, pour le soins qu'ils ont pris en lisant ce mémoire et pour les commentaires dont ce mémoire a beaucoup bénéficié.

Finalement, je remercie Russell Schluter et Operine Banton, mes parents, sans le soutien de qui je n'aurai jamais pu accomplir ce travail.

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Chapter 1: Introduction

1.1 The Notion of Paraphrase

A paraphrase S_2 (of a given sentence S_1) is considered to be a complete sentence that manifests synonymy or semantic equivalence with another complete sentence S_1 (Milićević 2003: 1). Thus two sentences of a given language are called paraphrases of one another if they stand in a paraphrastic relationship—that is, if they stand in this sentential relationship of synonymy or semantic equivalency (Milićević 2003: 38). Once this paraphrastic relationship between two sentences has been observed, it is possible to create a paraphrase rule which specifies the syntactic, lexical or morphological information that may be altered in a given sentence without any alteration of semantic information.[1] This rule may be used as a theoretical tool known as a paraphrase (or paraphrastic) operation which may be applied to a sentence in order to obtain a paraphrase of that sentence whose differences from the original sentence lie in that information specified by the paraphrase rule.

One may sometimes consider the original sentence S_1 to be a simpler textual form of the semantic contents shared between it and the result of the paraphrase operation, its paraphrase S_2, making this latter textual form (i.e., S_2) the more complex textual form.[2] The simpler form may also be considered the *more usual* form, whereas the more complex form is relatively *less usual* (Harris 1957). The following sentences illustrate these concepts.

(1) Mary won a bicycle.
(2) It was a bicycle that Mary won.
(3) It was Mary who won a bicycle.

(4) Lucy gave John a sweater.
(5) John was given a sweater by Lucy.

(6) Louis promised that he would come.

[1] As Mel'čuk (1994: 37-53) has done in creating a list of paraphrase rules.
[2] Following, for example, Harris (1957). See also, section 2.2.

(7) Louis made a promise that he would come.

In each group of sentences a paraphrastic relation holds between the group's members. In the first group of sentences, we have the simpler form in (1), and the more complex forms, having cleft structures, in (2) and (3). In the second group of sentences, (4) is considered to be the simple form, whereas the passive structure in (5) is considered to be the complex form. The final group of sentences illustrates a paraphrase operation by which the main verb of the sentence is transformed into a support verb (light verb) followed by a nominalisation of the original main verb. In this case, (6) is considered to be the simple form and (7) the more complex form.

We remark, however, that the notion of relative complexity of paraphrases, as described, is not always clear, as we observe in the following two groups of paraphrases.

(8) Judith applied for employment insurance.
(9) Judith applied for unemployment insurance.

(10) Lucy gave John a sweater.
(11) Lucy gave a sweater to John.
(12) John received a sweater from Lucy.

The lexical synonymy in the first group of sentences, between *unemployment insurance* and its politically correct equivalent *employment insurance*, implies a paraphrastic relationship between sentence (8) and (9), however there are no additional lexical items involved in the paraphrase rule, simply a lexical replacement of units in the sentence. Thus it is difficult to determine a more complex form among the two paraphrases. Similarly, sentences (10) and (11) are paraphrases differing only in the order of expression of the arguments, permitted by the verb *give*, which allows this transitive alternation.[3] It is difficult to determine which form is the more complex form; (11) has more lexical units, but uses the *normal* manner in which one

[3] The term "transitive alternation" is taken from Levin (1993).

expresses the direct and indirect objects of a verb. And (12) is the conversive expression of (10) and (11), having exactly the same number of lexical units as (11).

1.2 The Importance of Paraphrase in Linguistics

1.2.1 Semantics

The paraphrase, as a manifestation of semantic equivalency, is central to the study of semantics in linguistics. Indeed, the properties and aspects of *having a meaning* for a given linguistic structure may only be studied through the properties and aspects of that linguistic structure to *have the same meaning* as another linguistic structure. Inevitably, the realm of discourse for describing the meaning of one linguistic structure is linguistic itself; thus, this description implies the establishment of a sameness in meaning between linguistic structures. Some linguistic frameworks have built a study of semantics through logical, symbolic meta-languages.[4] However, this realm of discourse is essentially based on a description of equivalencies, and thus implicitly uses and is based upon the notion of sameness in semantic content between propositions.

From another point of view, the study of the inter-changeability of a set of sentences within a given context is considered by some linguists to be a more objective manner in which language may be studied.[5] By this method of study, not only the property of sameness of meaning may be identified, but also the subtle changes in meaning, or of imperfect synonymy, which occur within a given context may be established, when interchanging what are previously considered to be paraphrases. Indeed, sentence synonymy, like lexical synonymy, is not always perfect. Where and how this imperfect paraphrase comes about is important information in theoretically modelling the semantic distinctions in a language.

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[4] For example, the "mid-western" tradition, following Montague (1973).
[5] For example, Harris (1951).

1.2.2 The Paraphrase in Computational Linguistics

Paraphrase is gaining importance as a tool in computational linguistics, as attest the increasing number of conferences dedicated to its study.[6] The importance of the paraphrase in computational linguistics is widespread among its sub-domains. We describe two sub-domains in which the paraphrase plays a central role: natural language generation, and machine translation.

1.2.2.1 The Paraphrase in Natural Language Generation

In natural language generation, one studies how to generate natural language by computer, based on a representation of information to be conveyed by the generated text. Sometimes this information may be given in the form of a sentence belonging to the language in question. Then the aim in natural language generation is exactly the computer generation of paraphrases in a given language. Because of the absence of linguistic intuition on the part of the computer in this process, the information regarding the circumstances under which a particular paraphrase operation may be applied becomes crucial, as we will illustrate. In considering the following sentences, one recognises a paraphrastic relationship.

(13) George helped his son with his homework.

(14) George gave his son some help with his homework.

This is the nominalisation and support verb paraphrastic operation first illustrated in examples (6) and (7). However, when one attempts to apply this paraphrase operation in different circumstances, one potentially generates an unacceptable sentence, as illustrated below.

(15) The music helped John to concentrate on his work.

(16) *The music gave John some help to concentrate on his work.[7]

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[6] Such as the *Workshop at the Annual Meeting of the Association of Computation Linguistics (ACL 2005), devoted to Empirical Modeling of Semantic Equivalence and Entailment*, and the annual *ACL International Workshops on Paraphrasing*.

[7] A theorist in the Meaning-Text Theory may argue that the nominal *help* in (16) is not a nominalisation of the verb *help* in (15). This argument is perhaps open to debate from different

Similarly, in sentences (17) and (18) we have perfectly acceptable paraphrases, (18) being the result of a passivising paraphrase operation.

(17) Lucy gave John sweater.

(18) John was given a sweater by Lucy.

However, when one attempts to apply the same operation to (19), one obtains an unacceptable sentence (20).

(19) John gave the performance his all.

(20) *The performance was given his all by John.[7 above]

Thus, we see that a set of applicability conditions for each paraphrase operation is necessary. And information regarding how a paraphrase operation acts on different types of sentences is very important in building a set of circumstances under which that operation may be applied.

1.2.2.2 The Notion of the Paraphrase in Machine Translation

The paraphrase is also central to the domain of machine translation. Indeed, translation may be considered as the study or practice of the establishment of linguistic equivalencies between linguistic structures of two different languages. In most cases, linguistic equivalencies cannot be effectively established by literal translation; there are often what Dorr (1994) calls translation divergences. These are

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theoretical points of view. We are not employing the lexical theoretical framework of the Meaning Text Theory. We propose, simply, to investigate the application of paraphrase operations as a computer program paraphrase generator would, which has access to a list of support verbs and nominalisations, and their acceptable combinations. Indeed, a possible manner in which one may deal with problems in paraphrasing would be to specify more lexical information, such as the different contexts in which a verb appears and the effect of these contexts on the achievement of a successful paraphrase. We hope to shed some light on this information in this thesis. The MTT's lexical theory could help to provide insights on how to achieve this, resulting, in some cases, in completely fragmenting a lexical item into different lexical items L_1, L_2, ..., L_n, but we do not explore this theory in any great detail. For more information, see Mel'čuk et al. (1995).

cases where the types and choices of lexical units and/or morphological expression of these units diverge between the source and target languages. In cases where there are these translation divergences, Dorr (1994: 597) explains that a "systematic solution to the divergence problem can be derived from the formalization of two types of information: (1) the linguistically grounded classes upon which lexical-semantic divergences are based; and (2) the techniques by which lexical-semantic divergences are resolved." The establishment of a theoretical paraphrase may be considered to be such a technique.

It is useful to know when translating a given sentence into another language what are the mechanisms for paraphrasing in the source and target languages, in the case where the original sentence would have no direct equivalent, or in the case where there is a language specific preference for a given form. In the case where the form to be translated cannot be translated without divergence, a theoretical form in the target language's representation could exist within an machine translating system to which the sentence is first translated and then provided a paraphrase operation to a form which exists.

Colominas Ventura (2002: 7-9) explains that the translation of support verbs may bring about a categorical divergence.[8/9] The following examples (adapted from Colominas Ventura (2002: 7)) illustrate this type of divergence.

(21) fer un badall (Catalan)	⇔	yawn
(22) express	⇔	zum Ausdruck bringen (German)
(23) in Unruhe geraten (German)	⇔	intranquil·litzar-se (Catalan) 'be uneasy'
(24) commit suicide	⇔	se suicider (French)
(25) go for a walk	⇔	se balader (French)

In these examples of nominalisations with support verb, a direct translation would have produced unacceptable language in the target language. For instance, in (24),

[8] A categorical divergence, distinguished by Dorr (1994) is a divergence in the grammatical categories enlisted in the translation of a source sentence and those of an origin

[9] Salkoff (1990) has also studied the machine translation of the support verb constellation.

rather than saying *commettre un suicide* in French through a direct translation from *commit suicide*, one would have the information that in French this construction is not acceptable, that there is no equivalent form with this nominal, and one would use the equivalent, *se suicider*. Similarly, in (25), rather than using the lexical unit *walk* in English, to translate *se balader* from French, one would have the information that *go for a walk* is preferred in English, and would make the appropriate paraphrase operation towards that form.

1.3 The Notion of Aspect and its Role in Paraphrasing

The aspectual meaning of a sentence is organised, according to Smith (1991), into two different levels: its situation type and its viewpoint. We will give a full discussion of Smith's theory of aspect in chapter 3. For the aims of this section, we offer the reader means for gaining an intuition of some of the distinctions that will be made, in order to lay the groundwork for a discussion of its importance for the construction of applicability conditions in paraphrasing.

There are five different categories of aspectual situations and two viewpoint aspects with which these situations may be expressed. The differences among these categories are accounted for by the different combinations of the properties of telicity, dynamicity, and durativity.

Telicity is loosely the property of a situation to have a *telos*, or inherent terminal endpoint, making it telic, or not, making it atelic.

Dynamicity is the property of a situation to have inner stages, making it dynamic, or not, in which case it is static.

Durativity is the property of a situation to have endpoints which coincide, in which case it is punctual, or not, in which case it is durative.

From the possible combinations of these different properties, the five types of situations (States, Activities, Accomplishments, Achievements, and Semelfactives), and the two types of viewpoints (Perfective and Imperfective) are established. The following sentences demonstrate some of these properties.

(26) John loves Mary. (State)

(27) John is running. (Activity)

(28) John ran to school. (Accomplishment)

(29) Anne reached the top of the mountain. (Achievement)

(29a) Margaret coughed. (Semelfactive)

Sentence (26) is static and atelic; sentence (27) refers to a dynamic, atelic, durative, expressed in the imperfective viewpoint; sentence (28) refers to a dynamic, telic, durative situation, expressed in the perfective viewpoint; sentence (29) refers to a dynamic, telic, punctual situation, expressed in the perfective viewpoint; and sentence (29a) refers to a dynamic, atelic, punctual situation expressed in the perfective viewpoint.

Some notions of how aspect may affect results of paraphrase operations have already been documented. Consider the following sentences ((30) and (31) taken from Smith (1991:12), and (34) and (35), adapted from Mel'čuk & al. (1992: 35)).

(30) The bird is flying.	The bird is flying fast.
(31) The bird is in flight.	*The bird is in flight fast.
(32) The ship moved.	The ship moved through the waves.
(33) The ship was in motion.	*The ship was in motion through the waves.
(34) She cried.	She cried loudly.
(35) She was in tears.	*She was in tears loudly.

We observe that the conditions under which these groups of sentences are equivalent are restricted at least to those contexts where the verb is not modified. Smith (1991: 12) explains that the problem is due to an aspectual incompatibility. Indeed, (30), (32) and (34) present Activities, whereas (31), (33) and (35) present States—the state

of being in (or localistically, be located in) the *path* of the Activity.[10] One is able to modify the internal stages of the Activity, because an Activity is, by definition, dynamic, and thus has internal stages. However, States do not have internal stages to modify, by definition; since "States are static and unchanging, the sentences contrast with each other in the key properties they ascribe to the situation (Smith 1991: 12)."[11]

Similarly, Kittredge (1972: 405) explains that there is a telicising effect of the paraphrase operation transforming a verb into a support verb with nominalisation. He gives the following examples to illustrate.

(36) I walked.	I took a walk.
(37) I walked for ten minutes.	*I took a walk for ten minutes.
(38) He talked with John.	He talked with John until the train came.
(39) He had a talk with John.	*He had a talk with John until the train came.
(40) He studied flatworms.	He studied flatworms for three years.
(41) He made a study of flatworms.	*He made a study of flatworms for three years.

The unacceptability of sentences (37), (39), and (41) results from an aspectual incompatibility. Sentences (36), (38), and (40) are atelic, whereas (37), (39), and (41) are telic as a results of the paraphrase operation in question.[12]

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[10] For more on the notion of path, see Smith (1991:33-36).

[11] Mel'čuk et al. (1992: 35) calls these approximate paraphrases: "Ainsi, *en larmes* ≈ A_1(*pleurer*), en sorte que *Elle pleurait* ≈ *Elle était en larmes*; or cette égalité n'est qu'approximative, si bien que, dans de nombreux contextes, elle ne peut pas se réaliser [...] ."

[12] Prince (1972: 409) also affirms the boundedness of such resulting paraphrases. Also, Nakhimovsky (1992: 177) explains that these types of collocations are often used to express the same meaning expressed in Russian by the perfective-atelic prefix *po-*.

1.4 Problematic Posed by Paraphrase Operations and Goals of Thesis

As demonstrated in the previous two sections, there is a definite need for the construction of a set of applicability conditions of paraphrase operations. However, to date, there has no systematic account of such applicability conditions.[13] In order to do this, one would have to first determine the undesired effects of paraphrase operations on arbitrary sentences. As discussed, observations have been made concerning the importance of aspect in paraphrase operations, but without any systematic study of applicability conditions from the point of view of aspect. Generally, there has been no systematic study of undesired effects of any particular paraphrase on an arbitrary sentence.

The goal of this thesis is to investigate the paraphrase operation which transforms a verb into a support verb plus nominalisation construction, particularly in that direction of application, in order to study the types of unacceptable paraphrases that may be generated, in terms of generated meaning changes or unacceptable language.[14] This research has been carried out with the hypothesis that understanding the aspect of the studied sentences may provide more indications of resulting (un)acceptable paraphrases, in the sense that many unacceptable paraphrases are unacceptable, because they have altered the aspectual distinctions of the original sentence.

In our discussion, we will not be looking at the precise form that the paraphrase takes; we only verify if a result of the paraphrase operation exists.[15] Only where the paraphrase is unacceptable will we be trying to detect reasons for this unacceptability based on form and meaning. We will also not be focussing on the lexical categories of verbs, as our corpus size does not permit such generalisations.

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[13] There has been detailed study of the paraphrase formally and lists of discovered paraphrases assembled by such researchers as Milićević (2003) and Mel'čuk et al. (1992), without the gathering of applicability conditions of these paraphrases as operations.

[14] For more information on the components of this construction, see for example, Mel'čuk & al. (1995: 125-153). Also, we remark that this support verb plus nominalisation construction has been considered important enough for researchers such as Stevensen & al. (2004) to have considered the statistical distribution of occurrences of it, and Salkoff (1990) who studied its machine translation.

[15] The conditions for the existence of a paraphrase resulting from this operation are discussed in Chapter 4.

For this same reason, we will not be constructing the set of applicability conditions necessary for predicting the result of an application of this paraphrase operation. However, the hope of the authors is that the results of the research carried out will be beneficial to work toward this construction, and that it may aid in the research of other paraphrase operations also.

1.4.1 Paraphrase Rule 18

The paraphrase operation we are studying corresponds to a paraphrase rule—paraphrase rule number 18—described in Mel'čuk & al. (1992: 39). For this reason, we will be referring to it as Paraphrase Rule 18 throughout the thesis. Paraphrase Rule 18 is technically called in Mel'čuk & al. (1992: 39) a sort of fission with support verb. It involves the articulation or 'breaking up' of a single lexical unit—the main verb—into a support verb and nominalisation of that main verb. The nominalisation becomes the second syntactic actant of the support verb, while the grammatical subject of the original sentence remains the grammatical subject of the support verb in the paraphrase. In terms of relative complexity, the support verb and nominalisation construction would be the more complex form of the main verb.

According to the Meaning-Text theory on syntactic structure, this rule has the following representation, where $C_{0(V)}$ denotes the original lexical unit (the verb) in question, $S_0(C_0)$ is the nominalisation of this lexical unit, and $Oper_1(S_0(C_0))$ stands for a particular kind of support verb for this nominalised form. The $S_0(C_0)$ is the second syntactic actant of the support verb $Oper_1(S_0(C_0))$ (Mel'čuk & al. 1992: 39).

$$C_{0(V)} \quad \Leftrightarrow \quad \begin{array}{c} Oper_1(S_0(C_0)) \\ \downarrow II \\ S_0(C_0) \end{array}$$

The following sentences, translated from Mel'čuk & al. (1992: 39) illustrate.

(42) John welcomed us (warmly).

(43) John gave us a (warm) welcome.

(44) John gave us a (warm) welcoming.

Sentence (42) is the original sentence. Sentences (43) and (44) are the possible results of the paraphrase operation. In these sentences, the support verb is *give*, and the nominalisations are, respectively *welcome* and *welcoming*. In terms of relative complexity, one may consider sentence (42) as simpler than its paraphrases (43) and (44).

1.5 Organisation of Research and Thesis

1.5.1 Research Organisation

For the research on the applicability conditions of Rule 18, we have carried out a preliminary study of the paraphrase rule as it appears, illustrated in Mel'čuk & al. (1992), but translated into English. Following this preliminary study, we gathered a corpus of four articles—English scientific and journalistic texts, to be discussed in Chapter 4. Equipping ourselves with the tools on aspect provided in Smith (1991), we carried out a classification of the 223 sentences in the corpus in terms of aspect. Following this classification, we attempted to apply Paraphrase Rule 18 to every sentence, and studied the unacceptable results.

1.5.1.1 Terminology and Theoretical Framework

One of our methodological goals in the presentation of our findings was to make the language of this thesis as theory-independent as possible. As such, the terminology used will be that which we have found to be the most common in the literature. However, as we are using much of the theory of Smith (1991) and the Meaning-Text Theory, we will often be employing terms from them also. In fact, we consider Smith (1991) to be somewhat theory-independent in her language, and our borrowings come mainly from this work. Generally speaking, and among other borrowed terms, all

terminology that we employ concerning aspect will be in line with the terminology on aspect as defined by Smith (1991). We will also, however, be using some terms taken from the Meaning-Text Theory as needed. Terms taken from the Meaning-Text Theory will be explained as they are introduced.

For the most part any new terminology about aspect will be introduced in Chapter 2. Another term of Smith's which we will be using throughout the text is *verb constellation*. A verb constellation is generally the verb of a sentence together with its arguments (including a variety of complements which may even be adverbial). Thus, a verb constellation may be a simple verb, a verb phrase or even a verb phrase with a certain type of subject, or (sentential or otherwise) adverbial, or object.

Two other terms, not often found in the general linguistic literature, that we should define more precisely, are paraphrase operation and paraphrase rule.

A *paraphrase rule* is a rule stating a semantic or syntactic relationship of equivalency possessed by two sentences that are paraphrases of one another.[16]

A *paraphrase operation* is intended as a mapping between sets of sentences, which, when applied to a sentence, is intended to result in a paraphrase of that sentence.

1.5.2 Organisation of Thesis

We begin our enquiry in Chapter 2 by a discussion of the previous work done on the paraphrase. In Chapter 3, we discuss aspect. In particular, we will be presenting Carlotta Smith's theory of aspect and the specific criteria employed in the aspectual classification of sentences occurring in the studied texts. In Chapter 4, we present the results of our research, including an analysis of some problems encountered in the application of Rule 18. And finally, in Chapter 5, we formulate our conclusions and questions for future research.

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[16] We will be discussing paraphrases and paraphrase rules in more detail in Chapter 3.

Chapter 2: Previous Work on Paraphrases

2.1 The Paraphrase

Linguists have, a fortiori, always implicitly recognised the importance of the paraphrase. The recognition of 'sameness' in meaning, of course, could not go unrecognised, as it was the unique means of comparison between utterances and lexical units. Linguists working in comparative linguistics as well as linguists benefiting from studies carried out within the framework of a comparative linguistics implicitly placed what one might refer to as the 'inter-lingual' paraphrase as a foundation for comparative study of linguistic expression.[17] However, the development of the role of the paraphrase in linguistic inquiry has not always been explicit. In this section, we will begin with an exploration of the development of the explicit role of the paraphrase in linguistic inquiry. Such an exploration, of course, will begin with the ground-breaking work of Zellig Harris and the Pennsylvanian School. To follow, we have chosen to speak of three other major contributions: Functional and Systemic-Functional Linguistics, Catherine Fuchs' cognitive linguistic approach, and finally Meaning-Text Theory.

2.2 The Harrisian Concept of the Paraphrase

Any discussion of the development of a concept in formal linguistics almost necessarily commences with a discussion of Zellig Harris. Indeed, Harris offered the first modern attempt at determining the explicit role of the paraphrase in linguistic inquiry, with the introduction of the notion of *transformation*. His conception of the paraphrase is reflective of his view of the grammar of language as a composition of two distinct systems: one system which processes the objective information and another which allows for variation in the expression of this objective information.

A transformation, according to Harris, describes an equivalence relationship between *sentence schemata* that are established through the analysis of context-

[17] Pottier (1976: 3-11), for example considers translation as a particular case of paraphrasing.

specific co-occurrence. This equivalence relationship is particular in two ways. Firstly, it is context-specific; that is, a relationship of transformation holds between two schemata if the scale of acceptability of their respective occurrences/realisations remains unmodified. Secondly, it is ordered: given a set of structures that are transformations of each other—a set of (syntactic) paraphrases—the elements of this set are comparable in terms of their complexity. That is, it is possible in many cases to talk of a more complex paraphrase and a lesser complex one. Consider, for example, the following sentences (taken from Plötz (1972: 5)).

(45) The memorable concerts were recorded in Prades.

(46) The concerts were memorable: The concerts were recorded in Prades.

(47) They escaped, saving nothing.

(48) They escaped: They saved nothing.

In these two pairs of sentences, (46) and (48) are considered to be the simpler forms of (45) and (47). Thus, one may speak of the least complex element of the set.

According to Harris, by means of various paraphrastic transformations of *simplification* on the elements of the set of all sentences, one may discover the *kernel* of language, the set of least complex sentences of language. In this set, he maintains, one may find the objective information of language. The simplest element of a given set of paraphrases is considered to be the source of more complex paraphrases. This way, it is possible to regard transformations as a product of a restricted number of basic operators.

Simplifications are one aspect of the Harrisian concept of paraphrase. However, transformations are also considered to be general equivalencies within a given text. A proposed transformation outside of text is restricted by certain conditions in its application, such as neither changing the morphemes nor the grammatical relations of the sentence.

Harris' transformations are essentially syntactic (permutations, zeroing, morphophonemic change, nominalisation, passivisation, etc.), as may be observed in the following examples (Milicévic 2003: 109-110).[18]

(49) She will come on Tuesday.
(50) On Tuesday, she will come.

(51) He trod water.
(52) He treaded water.

(53) Disney acquired Apple.
(54) Disney's acquisition of Apple.
(55) Apple was acquired by Disney.

2.3 *Functional Linguistics*

There are many traditions of functional linguistics. We will discuss two, one usually referred to as the Prague School (which has members such as V. Mathesius, J. Firbas, P. Sgall, F. Daneš) and the other encompassing those researchers of British functionalism or Systemic-functional linguistics (in particular, Michael A.K. Halliday).

2.3.1 The Prague School's Concept of the Paraphrase

The Prague School works with a notion called the Functional Sentence Perspective. Under this perspective language is treated as a functioning, dynamic system, adapted to its communicative role. Thus, common meanings may take on different communicative structures, affecting the lexical choice, word order and syntax of a given utterance. Often there is a distinction made, by researchers working under this

[18] We note that Harris targeted syntax and not semantics.

framework, between the sentence, which is considered to be a unit of a language system, characterised by its semantic and grammatical structure, and the utterance, which is the realisation of a sentence holding, in addition, a specific lexical choice, syntax, word order and intonation contour, due to the added communicative information (Hajičová 1994: 251). The sentence is represented through deep syntax whereas the utterance is represented through surface syntax. An utterance is a paraphrase of another utterance if and only if they differ solely in their communicative structure—that is, if their underlying sentences are the same. Thus, the paraphrase is considered to be demonstrative of a logical equivalence on the deep (syntactic) level of representation of an utterance.[19] The Prague School considers results of paraphrastic operations as different surface structure manifestations of a same deep (syntactic) structure.[20]

The theoretical question remains as to how two utterances considered to be paraphrases may be differently organised in their surface structures. Unlike a sentence, an utterance is considered by the Prague School to be greatly determined by the context of communication in that one semantic component of the utterance usually contains old, already known or given elements, which function as a certain point of departure of the utterance, while other elements convey a new part of the information. An utterance's semantic components are semantically organised into groupings according to certain degrees of what is called communicative dynamism, these degrees lying between two extreme points: the theme (carrying the lowest communicative dynamism) and the rheme (carrying the highest communicative dynamism); between the two extremes are the components consisting in a kind of transition. Hajičová (1994: 249) defines communicative dynamism as "a property of communication, displayed in the course of the development of communication to be conveyed and consisting in advancing this development." And she further defines the "degree or amount of [communicative dynamism] carried by a linguistic element [to be] the relative extent to which it pushes the communication forward."

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[19] Hajičova (1994: 246) explains that this distinction between sentence and utterance is made by such researchers as, for example, Mathesius (1975), Daneš (1974), and Zemb (1968).

[20] In addition, the theme and the rheme of a parts of a sentence may also be distinguished. Thus, when one talks of the theme/rheme articulation of an embedded sentence, nominalisations also must be considered to have such a distinction (Hajičová 1994: 252).

The following sentences (taken and adapted from Sgall et al. (1986: 275)) give a partial example of how such differences might be manifested on the surface.

(56) Jan suggested to his son to arrange the exhibition.
(57) Jan made the suggestion to his son to arrange the exhibition.
(58) Jan suggested to his son that he arrange the exhibition.
(59) Jan suggested to his son the arrangement of the exhibition.
(60) Jan suggested the arrangement of the exhibition to his son.
(61) The arrangement of the exhibition was suggested by Jan to his son.

The communicative context along with open choices left to the Speaker, based upon this context, at the generation of text together determine the possible realisations of the deep structure.

2.3.2 Hallidayan Concept of the Paraphrase

Probably the most fully elaborated tradition of functional linguistics is Hallidayan linguistics—otherwise known as Systemic-functional linguistics (SFL). According to this tradition, language is analysable in terms of four strata: Context, Semantics, Lexico-Grammar and Phonology-Graphology. Systemic semantics is divided up into three components: (1) Ideational Semantics (concerning the propositional content of an utterance), (2) Interpersonal Semantics (concerning the speech-function, expression of attitude, and so forth), and (3) Textual Semantics (concerning how the text is structured as a message—that is, the expression of such oppositions as theme vs. rheme, given vs. new, as well as the rhetorical structure). Though Halliday does not explicitly indicate the role of the paraphrase, such a role is implicit in the description of the components of Semantics.

In one manner of describing the paraphrase, Halliday makes use of the concept of a grammatical metaphor. Under the SFL framework, a distinction may be made between two different modes of communication. The congruent mode is the typical and non-marked manner of speaking, corresponding to the most direct and

simple expression of a given utterance meaning. The metaphoric mode, on the other hand is a sort of 'roundabout' manner of speaking, observable only at the level of the utterance. One may consider a grammatical metaphor as an utterance observed to be stated under the metaphoric mode. Indeed, Halliday considers that the structural configuration of a proposition which is a grammatical metaphor is more complex than (and most definitely different from) the proposition one would observe if the meaning had been textualised by the 'shortest path'. There are three types of grammatical metaphors in SFL: transitivity metaphors, modality metaphors, and mood metaphors. The following sentences illustrate the three types respectively (and these examples are taken from Milicevic 2003 : 118-120).

(62) They arrived at the summit on the fifth day.
(63) The fifth day saw them on the summit.

(64) Mary probably knows.
(65) It's likely that Mary knows.

(66) The evidence is the fact that they cheated before.
(67) Look at the way they cheated before.

Halliday also considers paraphrases corresponding to distinctly structured relationships between propositions, such as different types of taxis and logico-semantic relationships (which are textual or rhetorical, such as projection and expansion). In addition, Halliday recognises register variation (for example, written vs. spoken) as well as communicative variation (for example, passivisation), which may also be considered as types of paraphrases. The following sentences illustrate these distinctions respectively (also taken from Milicevic 2003: 121).

(68) "Caesar was ambitious," said Brutus.
(69) Brutus said that Caesar was ambitious.

(70) Brutus' assertion that Caesar was ambitious.[21]

(71) I don't mind if you leave as soon as you've finished, as long as you're back when I need you.

(72) As long as you're back when I need you, I don't mind if you leave as soon as you've finished.

(73) In bridging river valleys, the early engineers built many notable masonry viaducts of numerous arches.

(74) In early days when the engineers had to make a bridge across a valley, and the valley had a river flowing through it, they often build viaducts, which were constructed of masonry and had numerous arches in them; and many of these viaducts became notable.

(75) The Duke gave my aunt this teapot.

(76) My aunt was given this teapot by the Duke.

(77) This teapot, my aunt was given by the Duke.

2.4 The Fuchsian Concept of Paraphrase

Catherine Fuchs' contribution is unique in that it is concentrated on the paraphrase in, relatively speaking, the most explicit and pure manner. According to Fuchs, the paraphrase is a relationship held between two utterances as a result of a metalinguistic judgement identifying the meanings of these utterance meanings M and M'. This judgement is essentially subjective—held by the Speaker by means of an interpretation of and a comparison between the two meanings M and M'. Indeed, the most remarkable aspect of Fuchs' view on the paraphrase lies in its relativism—a relativism stemming from the subjective judgement which is a cognitive act and not necessarily a linguistic one. Thus, according to Fuchs, linguistic equivalence is

[21] We recognise that this is not a sentence. The examples are taken directly as indicated.

neither a necessary nor a sufficient condition for establishing that two utterances are paraphrases. The paraphrastic relationship may have to be established in addition to other non-linguistic information or even in abstraction of linguistic identity. Consider, for example, the following sentences.

(78) I have been waiting here for half an hour!
(79) Where have you been?
(80) What took you so long?
(81) Have you seen what time it is?
(82) Thanks for showing up.
(83) You are very late, and I would like to know why, and I would like an apology for having been inconsiderate of my time.

Under certain circumstances all of these sentences could be considered to be paraphrases, in Fuchs' sense. However, there are also circumstances under which all sentences could not be considered paraphrases. Such determination depends on the context and psychological interpretations of the Hearer and Speaker in that context. What is important to note with Fuchs' take on the paraphrase is that the paraphrase is not necessarily considered to be the result of some purely linguistic operation. In that way, this conception is opposed to the other conceptions of paraphrase discussed in this chapter.

2.5 Meaning-Text Theory Concept of Paraphrase

The paraphrase is considered by the Meaning-Text Theory to be the principal means available to the linguist for the study of meaning, in that it allows the comparison of utterances by their sameness in meaning. More precisely, Mel'čuk et al. (1992: 11) define two utterances as being paraphrases of each other, or as sharing a paraphrastic relationship, if they are more or less synonymous. That is, paraphrases must be synonymous in their situational meaning (or representationally speaking, they must

have the same semantic structure), though their rhetorical and/or communicative meaning may vary.

Mel'čuk et al. (1992: 31) explain that there are two major types of paraphrases, corresponding to the two levels of organisation of the utterance: semantic paraphrases and syntactic paraphrases. Syntactic paraphrases are generally the better known of the types of paraphrases, being widely described by transformational grammars. They are those utterances sharing a paraphrastic relationship, but which share exactly the same semantically full lexical units [*lexies pleines*], only arranged differently in the given sentence. These paraphrases may be produced by simply choosing different syntactic constructions (Mel'čuk et al. 31: 1992). For example, the two following sentences are syntactic paraphrases of each other.

(84) Judith fulfilled the obligations that were indicated.
(85) Judith fulfilled the indicated obligations.

Semantic paraphrases are those utterances that share a paraphrastic relationship, but differ textually by at least one semantically full lexical unit [*lexie pleine*]. These paraphrases are produced by the different distribution of the original meaning (in the Semantic Representation) amongst the lexical units (Mel'čuk et al. 31: 1992). The following two sentences illustrate semantic paraphrases.

(86) The teacher gave excellent marks to the whole class.
(87) The whole class received excellent marks from the teacher.

Considering further semantic paraphrastic operations, there are two further sub-classes, based on the two types of semantic paraphrases. The first type of semantic paraphrases is those which are brought about by semantic rules; that is, they are brought about by different lexical choices, and therefore have to do with the

manner of unification or articulation of subsets of organised meaning within a given utterance.[22] The following two sentences illustrate this phenomenon.

(88) It was the arsenic that killed him.

(89) It was the arsenic that caused him to die.

In this example, we have *cause to die* is the articulated form of *kill*. Both lexical choices express the meaning 'kill'; thus, these sentences are paraphrases of one another.

The second type of semantic paraphrase has to do with what Mel'čuk et al. (1992) call lexical substitutions, and for that reason, they are also referred to as lexical paraphrases. They are brought about by certain rules, called lexical rules. And at the heart of lexical paraphrases is the Lexical Function (Mel'čuk et al. 1992: 31).

Mel'čuk et al. (1992: 31) define a lexical function as the following:

> "Une fonction lexicale (FL) est une dépendance, ou correspondance, f, qui associe à une unité lexicale, ou lexie, L, appelée l'argument [mot clé] de f, un ensemble d'unités lexicales, ou lexies, f(L)—la valeur de f."

For example, the following sentences are related by a lexical function

1. John ordered his dog to sit.
2. John made an order to his dog to sit.

The verbal phrases of these two sentences are related in that $order_V$ = $Oper_1(order_N)+S_0(order_V)$.[23] This latter type of paraphrase subsumes Paraphrase Rule 18 which we will be investigating in this thesis.

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[22] This organised meaning is represented in the Meaning-Text Theory by a semantic network. Thus, a subset of this organised meaning is actually considered to be a sub-network of such a semantic network. For more on Meaning-Text semantics, see for example, Mel'čuk (1997).

[23] See section 1.4.1 for an explanation of this paraphrase rule.

Chapter 3: Aspect

3.1 Survey of Previous Work on Aspect

It is a commonality in linguistics that between linguists working in the framework of different theories and even between linguists working within a same theory, there is much discrepancy between the appellations of linguistic notions and their delimitation (Mel'čuk 1982). Therefore, it is not surprising that there is no general agreement about the exact denotation of linguistic aspect. The present work offers nothing to the contrary, our goal being simply to make use of Smith (1991)'s description of aspect in our analysis of related problems in paraphrase operations. We have chosen Smith (1991)'s framework for a means to describe aspect for two reasons. Firstly, she has refined the well-known aspectually categories described by Vendler (1967), whose distinctions we wanted to use, since they are considered fundamental in discussions of aspect today. Secondly, we consider her to be the most accessible recent authority in that tradition, the accessibility of this thesis being a major goal as mentioned in Chapter 1. However, to put into context Smith's description, we must first examine what is considered by general mainstream linguistics to be linguistic aspect. This is what we shall do presently.

In accordance with the distinctions made by Kabakčiev (2001), and Dahl (1981), we will organise our discussion as pertaining to one of two separate approaches: the Slavic approach and the Non-Slavic approach. Hence, we will begin our discussion of the previous research in aspect with what may be considered as the more traditional school of thought on aspect: the findings resulting from the Slavic approach. Following this discussion, we shall inquire into the findings defined through the Non-Slavic approach, carried out mainly on the basis of observations described by philosophers of language and of the mind, as a complement to the more traditional studies. We will end the survey of aspect with a mention of the point of view in Meaning-Text Theory, before passing to a more elaborated discussion of the views of Smith (1991), whose theory we will adopt for discussion and research in the remainder of this thesis.

3.1.1 The Slavic Approach

The general distinction that can be made is between the Slavic and Non-Slavic approaches to aspect (Dahl 1981: 80-81). As mentioned, one may consider the Slavic approach to the treatment of linguistic aspect as the more traditional of the two. This is for obvious reasons. Slavic languages have something that modern day languages like English, French and German do not: an extensive grammaticalised system of what are traditionally referred to as the aspectual categories of completion (i.e., the opposition perfective vs. imperfective) and duration (i.e., the opposition aorist vs. durative) which is a distinct morphological system from tense (as well as other morphological categories). In fact, the conventionally employed term *aspect* is the translation of a Russian term *vid*, which refers to the opposition of perfective and imperfective in the Slavonic languages (Lyons 1977: 705).

Under this approach, one must keep in mind, not only Slavic languages and other languages morphologically rich in aspectual expression are considered to have aspect. Also under this approach, such languages as French and English are often studied from the point of view that they have simpler and less extensive expression of aspect which is combined with tense. Thus, *I was reading* is opposed to *I read* as a progressive aspect versus a non-progressive aspect (cf. Comrie 1976).

3.1.2 The Non-Slavic Approach

The Non-Slavic approach, on the other hand, has extended the term *aspect* to cover a variety of other common oppositions, such as frequency, phase, resultativity, quantification (of the linguistic situation) and so forth. Sapir (1921: 108) and Jespersen (1924: 286-289), remarked that the semantic meanings represented by the grammatical categories of the Slavic languages could probably be found in any language; thus, aspect, in this view, can be considered in broader terms—as a semantic notion and not simply as a grammatical category. And, in that respect, it is in accordance with this wider view that the present research has been conducted.

Aspect, then, broadening slightly the definition set forward by Comrie (1976: 3) which concerned only the meaning of the verb, can be considered to denote

different ways of viewing the internal semantic temporal constituency of a situation.[24] Under this view, it is not only a morphological phenomenon, but a semantic phenomenon, expressible lexically, morphologically, as well as syntactically. Lyons (1977: 706) explains that this broadened view in the discussion of aspect—that besides the morphological oppositions expressing aspect, one must also take into consideration the particular character of lexemes denoting situations—is generally accepted nowadays. This view is consistent with the statement that Sapir made already in 1921, that "aspect is expressed in English by all kinds of idiomatic turns rather than by a consistently worked out set of grammatical forms" (Sapir 1921: 108).

Such a view is often referred to as the "Aristotelian" categorisation of verbs and verb phrases, notably elaborated by three philosophers: Gilbert Ryle (1949), Anthony Kenny (1963), and Zeno Vendler (1967). Vendler's classification is the one which is mainly adopted and elaborated on in the linguistic literature and this thesis will prove no exception. Vendler distinguishes between four categories of verbs and verbal phrases by their restricted meanings with time adverbials, tenses, and logical entailments. These are the categories of States, Activities, Accomplishments, and Achievements. In essence, these categories are the same as those included by Smith (1991), without the added distinction of Semelfactives. Many accepted tests for aspect found by Vendler (1967) are also incorporated into Smith's theoretical framework.

Denoting this phenomenon, one often comes across the term Aktionsart—originally meaning "type of action". As pointed out by Lyons (1977: 706) and Comrie (1976: 6), however, this term had come to denote two different types of phenomena. The first type of phenomenon referred to by this term is the general distinction between the grammatical expression of aspect and the lexical expression of aspect; in this case Aktionsart refers to the semantic distinctions observed within the grammatical morphological systems observed by Slavic aspectologists, but expressed lexically, through the co-occurrence of various lexical components of a sentence. The second type of phenomenon referred to, which is actually more frequently adopted by linguists of the Slavic approach, is based on the distinction

[24] "Aspect is the domain of the temporal organization of situation (Smith 1991: xvi)".

between aspect which is expressed derivationally and that which is expressed flexionally.[25]

The distinction between *Aktionsart* and *aspect* in the first sense, that is where *Aktionsart* denotes the lexicalised expression of the morphological distinctions to which Slavic aspectologists refer to as *aspect* and *aspect* in terms of these same morphological oppositions, is important in the work of Dahl (1985, 2000). Dahl explains that "Verb lexemes differ as to their 'Aktionsart' or 'inherent aspectual meaning'; in addition, some languages distinguish different morphological forms of the same lexeme, called 'Aspects', according to the context in which the verbs are used (1985: 26)."

This distinction has been presented under different names in the literature, notably by Lyons (1977), and Smith (1991). Lyons makes the distinction between what he calls *aspectual character* and *aspect*. He explains that the aspectual character of a verb is "that part of the meaning of the verb whereby it (normally) denotes one kind of situation rather than another (1977: 706)." This term is then opposed to *aspect* which is, for him, all of the grammaticalised oppositions in the structure of particular languages such as duration, instantaneity, frequency, initiation, completion, etc. Lyons' distinctions then are very much linguistic distinctions. As opposed to Lyons' use, we will not consider the term aspectual character in this thesis to refer to something different than what we refer to as aspect. We consider aspect and aspectual character to be synonymous here, keeping in line with the work of Smith (1991).

A similar distinction between the same phenomena made by Smith (1991), on the other hand, has more of a conceptual-rhetorical basis. Smith distinguishes between what she calls *situation aspect* and *viewpoint aspect*. Thus, situation aspect is related to Dahl's Aktionsarten, but in the respect that there are certain situations which have been conceptualised by human beings within a distinct linguistic community, and which have the status of being objective. These situations are expressed through verbs and verb phrases which have their own inherent aspect.

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[25] Mel'čuk (1994 :337) seems to adhere more to this definition, though his version differs somewhat. He describes Aktionsart, rather, as a category of derivatemes which characterise or make precisions on the actual manner in which the action is carried out.

However, depending on a person's viewpoint of these situations, the aspect may have to be modified, hence the viewpoint aspect. Smith explains that viewpoint is what gives the Hearer a full or partial view of a situation. In this manner, she presents viewpoint aspect as the result of a choice made by a Speaker to portray a situation in a way which gives the Hearer a full view or a partial view of a situation. And then, "the aspectual meaning of a sentence [would be] a composite of both the viewpoint and the types of situation" (Smith 1991: 3).

Kabakčiev (2000) questions what he perceives to be the idiosyncrasy of Smith's theory of aspect. Smith (1991:297) affirms that "Speakers [of Russian] are keenly aware of aspectual choices and of their pragmatic and rhetorical effects." But Kabakčiev cannot support this view. In his view, aspectual choices are made unconsciously by native speakers, and the expression of aspect is not the result of a rhetorical choice made on the part of the Speaker.

Kabakčiev (2000)'s own study of aspect in English is elaborated on the basis of a comparative study between Bulgarian and English, notably the (morphological) expression of aspect in Bulgarian and its equivalent expression in English. Thus, he refers to aspect as the semantic expression of completeness—that is, the perfective ~ imperfective opposition.

Regardless of motivation for the terminology, Smith's terminology covers the basic categories generally considered as significant for research on aspect.

3.1.3 The Meaning-Text Theory's View on Aspect

Before leaving the subject of previous studies on aspect, we look at the definition actually outlined by theorists within the Meaning-Text Theory, since it is the framework with which we have chosen define paraphrases. The most logical step would have been simply to adopt the definition of aspect set forth by Mel'čuk, primary researcher and founder of the theory.

According to Mel'čuk (1994: 77-95), there are five different types of aspect all describing the numerical quantification of the situation through purely morphological means; these types correspond to five categories of morphological elements possible in a language: *AspectsI-V*.

AspectI denotes the category in which the elements (denoting 'neutral', 'multiplicative, or 'semelfactive') express the number of situations in question.

AspectII denotes the category in which the elements (denoting 'concentrative', 'distributive', 'iterative' and 'distributive-iterative') express whether or not the situation in question is concentrated in one place and at one particular moment, or if it is distributed in space or time.

AspectIII denotes the category in which the elements (denoting 'punctual', 'durative', and 'habitual') express the extension through time of the situation in question.

AspectIV denotes the category in which the elements (denoting 'progressive' and 'non-progressive') express whether the situation in question is taking place at a precise moment or not. Finally, AspectV denotes the category in which the elements (denoting 'perfective' and 'imperfective') express whether the internal limit of the situation is (or must be) achieved or not.

We find, however, the definition of aspect as the quantification of the situation adopted in Mel'čuk (1994: 77-95) as too restrictive. Mel'čuk explains the reasons for his choice:

> On tend à appeler aspect toute catégorie (flexionnelle) verbale qui n'est ni temps, ni mode, ni voix; par conséquent, le terme *aspect* est devenu une notion "à tout faire", vidée de tout contenu précis. Pour parer à cet état de choses, dans le CMG[26], nous avons restreint le concept d'aspect à des caractérisations QUANTITATIVES des faits.
>
> (Mel'čuk 1994: 95).

And he retraces this move back to Jakobson (1957).

In our study, and in accordance with the work of Smith (1991), we will consider aspect to cover a larger array of phenomena.

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[26] "Cours de morphologie générale."

3.2 Carlotta Smith's Theory of Aspect

Smith describes aspect as a linguistic phenomenon that contributes to the meaning of a sentence in terms of the objective information communicated about a given situation as well as the subjective information, or point of view, which the Speaker chooses to communicate about the situation. She terms this theoretical approach as the two-component theory, opposing respectively situation type as the objective information and viewpoint as the subjective information, the two basic components of aspectual systems, whose interaction results in aspectual meaning. Smith recognises that these two components both convey information about internal temporal constituency of situations, as psychologically perceived by humans and accordingly reflected in language, and as such cannot be discussed in isolation. On the one hand, the Speaker is constrained by the type of information that he wishes to communicate, but on the other, he may choose to shape this information aspectually from his point of view.

We will begin with the discussion of Smith's situation types in English in the following section, after which will oppose to these types viewpoint.

3.2.1 Situation Type

Smith distinguishes five types of situations: States, Activities, Accomplishments, Semelfactives, and Achievements. This categorisation of situations is based on the distinction of three distinct temporal properties: dynamism, durativity, and telicity.

3.2.1.1 Dynamism

The most important distinction that we can make among these types of situations separates most States from the other situations, which Smith calls, simply, events; it is the property of dynamism. A stative situation is one that is sometimes conceived of as existing, rather than happening (Lyons 1977: 483). In that sense, stative situations denote constant states of affairs or stasis through time, whereas non-stative situations denote varying states of affairs, or movement through time.

Smith (1991: 28) explains that "cognitively, the distinction between stasis and motion is fundamental." This is, to our mind, an analogy of the distinction between the more basic notions of sameness and change. The distinction between stative and dynamic situations is relative to this distinction. An object may described in terms of its characterisation as an individual regardless of whether the object is in stasis or in movement; or it may be described in terms of its stasis or movement. Put differently, an object may be described in terms of its individuality regardless of its change or modification of the environment, or in terms of this participation producing change or modification in the environment. Therefore, a situation is either descriptive of the sameness of an agent throughout the change, or descriptive of the change and modification of the environment (or state of affairs).

Stativity, then, may be defined as the characterisation of a situation as equivalent to the expression of the sameness of a situation independently of any modification of the environment. Dynamism would be the characterisation of a situation as equivalent to the expression of a situation where an agent carries out change or modification of the environment.

Let us consider the Stativity of these following sentences:

(90) John is a reporter.
(91) Joe is working as a reporter right now.[27]
(92) James solved the problem.

The first sentence characterises the individual, John, independently of John's modification to the environment, since it is a stable situation of the environment and of John that John works as a reporter. This is not the case in the second sentence. The situation denoted by this sentence is one in which it is not a characterisation of Joe and of the environment that Joe is a reporter; it is a temporary change of the environment. And the third sentence denotes a change in state in the environment

[27] I.e., if we were to look at John in this instant, we'd see him taking notes in an interview or doing some other reporter-like activity.

between the state of James not having solved the problem and James having solved the problem; thus, it is a dynamic situation.

The concept of motion involves inner structure, direction and development (towards some end). Hence, a dynamic situation will possess these features. Stativity completely excludes these features so that we may speak of stative situations as those situations that are not dynamic.

Smith's discussion of situation types often involves what she terms the internal stages of a situation. The description of a situation in terms of whether it possesses internal stages or not describes the property of that situation to consist of simpler bounded situations called stages as opposed to undifferentiated situations. Such a characterisation of situations, explains Smith (1991: 29), is typical of dynamic situations, and therefore, though discussion of the internal stages is interesting, it is not necessarily relevant to the distinction between the five situation types.

3.2.1.2 Durativity

Durativity, also called Duration interchangeably by Smith (1991), describes the temporal property of a situation to be instantaneous or not, that is, respectively, punctual or durative. Boundedness plays an important role in Durativity. A situation is punctual if its starting point is at the same temporal location as its endpoint—that is, if its starting point is the same as its endpoint. In this way, a punctual situation is instantaneous. This is not to say that in the 'real world' these situations do not have a given Conceptual Temporal Extension. In conceptual terms, Smith explains that

> [...] the notion of an instantaneous event is an idealisation. Strictly speaking, an instantaneous event may take several milliseconds, perhaps even enough time to be perceptible, without marring its categorisation as punctual.
>
> (Smith 1991: 29)

In more linguistic terms, one may say that a situation which is considered to be punctual has a linguistic meaning in which the initial endpoint is represented as being undifferentiable from the terminal endpoint. Once a Speaker can affirm a punctual

situation, he must affirm it as having met its end—that is, in the past tense. In that way, linguistically, a punctual situation has no quantity of duration. Evidently, as stative situations have no bounds, they are not punctual. Only dynamic situations enter the realm of description in terms of Punctuality. In particular, this aspect is especially important for discussion of Achievements and Semelfactives.

A situation is durative if it is not punctual—if its beginning and endpoints do have different temporal locations, that is, if the situation does, indeed have any bounds at all. If we have described a punctual situation as one that is instantaneous, then we may consider durative situations as ones that are represented linguistically as having a certain duration.

Most linguists have described Durativity in English in terms of the presence or absence of temporal adverbials expressing a given duration, or the completeness of a given situation. This is not the view held by Smith. The presence or absence of temporal adverbials expressing duration are only manifestations of a different sort of durativity, which has more to do with quantification than with aspect. Indeed, we may make the difference between determined Durativity and undetermined Durativity. Consider, for example the following sentences:

(93) He ran.

(94) He ran all afternoon.

Sentence (93) would be considered by many linguists as punctual, and sentence (94) as durative. The situations have, perhaps, different quantities of duration. But this is not durativity as presented by Smith (1991). Rather, Smith explains that the situation denoted by run has no inherent ending and thus cannot be considered to be punctual.

3.2.1.3 Telicity

Telicity is the character of a situation to possess an inherent endpoint, that is, a situation's *telic* or non-*atelic* character. The term Telicity was coined by Vendler

(1967); he derived the term from the Ancient Greek word *telos*, meaning 'end' (or 'target'). Consider, for example the three following sentences:

(95) John is running.
(96) John ran for an hour.
(97) John recognised Julie.

In the first sentence, (95), we are in the presence of a situation with no inherent end, no *telos*. On the other hand, one must acknowledge that in (96) and (97) the respective situations have been presented as reaching an inherent end, which Smith also terms a "natural final point". Smith (1991: 29) explains that all events may be characterised as either telic or atelic.

3.2.2 Situation Types and Their Distinguishing Properties

In combining the distinguishing properties of Dynamism, Durativity, and Telicity together, we are presented with five different situations. The property of Dynamism separates States from events. Then within the category of dynamic situations, the properties of Durativity and Telicity must be distinguished. This gives the following table of situation types (taken from Smith (1991:30)).

Situations	**Static**	**Durative**	**Telic**
States	+	+	N/A
Activity	-	+	-
Accomplishment	-	+	+
Semelfactive	-	-	-
Achievement	-	-	+

Figure 1: Table of Five Situation Types

3.2.2.1 States

States make up the sole type on non-dynamic situations. They typically denote such properties as possession, location, mental or psychological states, habits and generics situations. For example, the following sentences are what Smith (1991: 42) calls stative sentences:

(98) John is happy.
(99) Judy is persuasive.
(100) Mary knows the answer.
(101) Mark has a tattoo.

Stative sentences, explains Smith, do not appear in any constructions directly involving any dynamic property or agency on the part of the grammatical subject. Because of this constraint, such constructions are useful in the testing of sentences in order to determine Dynamism. This provides, specifically the following tests for Stativity:

Test 1. Embedding the verb constellation under a verb involving agency such as FORCE or PERSUADE, qualifying the verb constellation by an adverb involving agency such as DELIBERATELY, or placing the verb constellation in the imperative.
Test 2. Expressing the verb constellation in the pseudo-cleft construction.
Test 3. Expressing the verb constellation in the progressive.
Test 4. Qualifying the verb constellation by an expression of punctual duration, such as *for an instant*, or *at noon*.

If the application of any of the above tests produces an ungrammatical (or semantically awkward) sentence, the situation type in question is generally a State. Otherwise the stativity of the situation is undetermined.

3.2.2.2 Activities

Activities are durative, atelic, dynamic situations having an internal structure consisting of successive homogenous stages, usually described as processes (Vendler 1976: 99; Shi 1990: 53; Comrie 1976; Smith 1991: 28). Due to their status as processes, their termination is imminent, but not their completion. Activities are not describable in terms of completeness because of their atelicity. Smith calls this property that of having arbitrary endpoints. Indeed, the termination of an Activity is merely its stated or unstated temporal bound (Smith 1991: 45).

Here some examples of sentences denoting Activities:

(102) John was playing in the street.
(103) June is studying.
(104) Mark is thinking about her cat.
(105) Judy ate cherries.
(106) George is smoking.

As we observe from the examples, there are physical activities as well as psychological activities which are involved in processes of cognition.

Smith explains that there are three main classes of Activities: Activities that are on going processes such as those illustrated in (102) through (104), Activities that have uncountable internal stages as in (105), and multiple-event Activities such as that in (106). One may observe that examples (105) and (106) describe sorts of plural or iterated activities. Activities that have uncountable internal stages was a major focus of Verkuyl (1993)'s work; they are the result of the undetermined complement *cherries*. The class of multiple-event Activities subsumes all those iterated telic events such as Semelfactives, Achievements, and Accomplishments, which will be the subject of our discussion in the following sections.

Due to the defining properties of Activities, there are a number of tests available to determine whether or not a given verb constellation is an Activity. Smith (1991: 47) explains that Activities are incompatible with any modification by forms expressing simultaneously duration and completion. This gives a test for Activities.

Test 5. Modify the verb constellation by *in an hour*.

If the result of this test is an awkward sentence then the original sentence is an Activity.

Further, Activities are homogenous (or continuous). A given meaning X is linguistically continuous if and only if any part of that meaning X is also called X; otherwise it is discrete (Mel'čuk 1994: 70). This is a distinguishing property of Activities from other dynamic situation types, resultant from the combined properties of Atelicity and Durativity (shared by States). Consider the following sentences:

(107) John was laughing about the joke.
(108) John laughed about the joke.
(109) Linda was writing a letter.
(110) Linda wrote a letter.

One observes that once the information in (107) is affirmed, the information in (108) is considered true also: if John has been laughing then John has laughed. However, the same relationship does not hold between sentences (109) and (110): if Linda was writing the letter, one cannot affirm by entailment that then Linda has written the letter. Perhaps she has written it, but perhaps something prevented her from completing the writing of the letter, or she decided simply to not complete the writing of the letter. Thus, once a test for dynamism proves that a given verb constellation is dynamic,[28] the following test is useful to determine if the verb constellation is an Activity.

Test 6. Examine the information conveyed by the verb constellation for continuity by asking if any part of the denotation of the given verb constellation may be equally denoted by the same verb constellation.

[28] That is, the test for Stativity came up negative.

If the result of this test is positive, then the situation type in question is an Activity. Test 6 is particularly effective. If the situation is dynamic and the result of Test 6 is positive, then the situation is certainly an Activity.

3.2.2.3 Accomplishments

Accomplishments are described by Smith (1991:49) as processes with progression towards a natural (non-detachable) endpoint at which the process is completed and cannot continue. These situations are dynamic, durative, and telic. It is as a result of their telic property that the notion of completion may be included into their disucssion. This is most definitely the fundamental property which distinguishes Activities from Accomplishments, since both are composed of processes. Whereas completion enters the discussion of Accomplishment, a fact which prevents the possession of the relation of entailment held by Activities, completion is irrelevant and inapplicable to Activities. Sentences (111) and (112) illustrate Accomplishments.

(111) Linda was writing a letter.

(112) Linda wrote a letter.

One may observe that the aspect of the sentence in (111) is incomplete; its denotation gives a partial view of the situation, whereas the aspect of the sentence in (112) is complete, giving a full view of the situation. Such differences in the expression of an Accomplishment are a result of different viewpoints, as will be discussed later in this chapter.

Evidently, the natural (undetachable) terminal endpoint in examples (111) and (112) is the finishing of the letter. The endpoint of an Accomplishment may take many different forms. The following Accomplishment sentences illustrate a few other types of terminal points.

(113) Judy ran to school.

(114) The workers were building a house.

(115) Mary studied until three o'clock.

(116) Jody drank a glass of water.

The Accomplishment in (113) has a destination as a terminal point. In (114) the terminal point is the finishing of the construction of an object. In (115) the terminal point is the end of an interval of time. And finally, in (116), the terminal point is the completely consumed object—the glass of water.

The non-detachability of the terminal point correlates to an entailment relation between the process and the outcome of the situation. If the outcome of an accomplishment occurs, then the process has also occurred. Thus, Accomplishments are often incompatible with expressions such *as all of a sudden* or *accidentally* that deny the existence of the process, while affirming the outcome, as the following sentences illustrate (Smith 1991: 50).

(117) John accidentally ran to school.

(118) All of a sudden, John derived the formula.

This gives the following test for Accomplishments.

Test 7. Modify the verb constellation by either of the adverbials *all of a sudden*, or *accidentally*. If the result is an awkward sentence, then the original sentence is possibly an Accomplishment.

This property Accomplishments to have two 'parts', so to speak, as well as a property of non-detachability between these parts of process and endpoint leads to a distinguishing characteristic of Accomplishments under modification by the adverb *almost*. They have an ambiguous denotation under modification by this adverb, focussing on either the beginning of the process or the 'beginning' of the endpoint (Smith 1991: 54). Consider the following sentence.

(119) John almost read the book.

The meaning of this sentence is ambiguously either 'John almost started reading the book', or 'John almost finished reading the book'. This is a unique property of Accomplishments, and it gives the following test.

> Test 8. Modify the verb constellation by almost. If the resulting sentence refers ambiguously to the starting of the process and the 'starting' of the endpoint, then the situation denoted is an Accomplishment.

Because of their properties of telicity and durativity, Accomplishments are compatible with verbs and adverbials of completion simultaneously expressing durativity, but incompatible with adverbs expressing only duration. In addition, Accomplishments modified by a punctual or momentary adverbial such as at noon, or embedded in verb phrases such as begin or start, are focalised into the beginning of the process part (Smith 1991: 55). Consider the following sentences.

(120) Mary finished writing the letter.
(121) Mary wrote the letter in ten minutes.
(122) *Mary wrote the letter for an hour.
(123) They began walking to school.
(124) They walked to school at noon.

The first two sentences illustrate the compatibility of Accomplishments with verbs and adverbial modification expressing completion. On the other hand, (122) poses a problem. Alone, the sentence does not make sense, because it presents a complete situation with a temporal modification, which suggests that the situation has nothing to do with completion. The last two sentences illustrate the focalisation of the situation on the beginning of the process. Such observations give the following three tests for Accomplishments.

Test 9. Embed the verb constellation in a verbal phrase expressing completion[29], or modify the verb constellation by an adverbial expressing completion.[30] If the result is an awkward sentence, then the situation type denoted is an Accomplishment.

Test 10. Modify the verb constellation by an adverbial expressing simple duration. If the result of the sentence is awkward, then the situation type denoted is possibly an Accomplishment.

Test 11. Modify the verb constellation by a momentary adverbial such as *in one second flat* or *just*, or embed the sentence in a verb phrase such as *start* or *begin*. If the resulting situation denoted is the beginning of the process of the situation denoted by the original sentence, then this original sentence possibly denotes an Accomplishment.

Test 9 is a particularly effective test; that is, sentences that are not rejected by Test 9 are definitely Accomplishments and not any other type of aspect. We also note that Test 11 produces the same results for Activities. Thus, this test is particularly useful to distinguish between telic situations: between, for example Accomplishments and Achievements.

3.2.2.4 Achievements

Achievements are punctual, dynamic, telic situations. They are instantaneous situations that denote, very specifically, endpoints themselves. For this reason the starting point of the Achievement is also its terminal point. Since they denote endpoints, Achievements imply change. In fact, explains Smith (1991: 58), they denote a change of state.[31] This implies that the starting point of an Achievement is also an endpoint of a Process or a State, and the endpoint of an Achievement is also the starting point of a Process or a State. The Achievement, therefore, is the point of

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[29] Such as *finish + verb*, or *complete + verb*. For more of a discussion on these types of verbs, see Smith (1991)'s discussion of path.

[30] Such as *in an hour*.

[31] Not to be confused literally with the situation type State. *Change of state* is an expression on its own, denoting the transition point between two different states of affairs.

change between two durative situations. Consider for example the following sentences,

(125) John fell asleep.

(126) John woke up.

(127) Aaron forgot.

(128) Elaine realised.

These are all Achievements. The verb constellation *fell asleep* in the first sentence denotes the starting point of the process *sleep*. The verb constellation in (126), *woke up*, denotes the terminal point of the process *sleep*. In the same way, the verb constellation *forgot* in (127) denotes the terminal point of the State *know*, whereas *realised* in (128) is the starting point of this State.[32]

The most important thing to recognise is that since the Achievement is both a starting point and a terminal point of other states or processes, they are describable most accurately in terms of the endpoints of other situations. Moreover, there is a situation which leads up to the Achievement, and a situation which follows it, both of which are not part of the meaning of an Achievement. In English, though it is possible to talk about the situation leading up to a given Achievement, through the progressive tense, for example, one may sometimes refer to the preceding processes of the Achievement. This is not always a possibility, however, as we observe in the following sentence.

(129) ?They were recognising their friend.

Smith (1991: 63) explains that Achievements are not always compatible with the imperfective viewpoint, because they have no internal interval of which the endpoints may be excluded. This gives the following necessary but not sufficient test for Achievements.

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[32] For a formal representation of this relationship in terms of phase and lexical functions, see Mel'čuk (1995: 142-143).

Test 12. Given a dynamic situation, if expression in the imperfective viewpoint produces an awkward sentence, then the situation is an Achievement.

Unlike Accomplishments if Achievements have any associated preceding processes, these processes are detachable; that is, the result of the Achievement does not necessarily imply the preceding processes. Thus, modification by adverbials expressing the absence of these processes, such as *accidentally*, are compatible with Achievements (Smith 1991: 60), as may be observed in the following sentence.

(130) John accidentally dropped the cup.

This gives the following test.

Test 13. Modify the verb constellation by an adverbial implying the absence of preceding processes. If the result is not awkward, then the original sentence is possibly an Achievement.

Since Achievements are punctual, they are incompatible with any adverbial constructions expressing simple duration such as *for a few minutes* (Smith 1991: 62), as in the following sentences.

(131) ?We reached the top for a few minutes.

(132) The fire cracker exploded for a few minutes.

We observe that sentence (131) is awkward, and sentence (132) is denotes an iterated situation, making it a derived Activity. This gives the following test for Achievements.

Test 14. Modify the verb constellation by an adverbial expressing duration, such as *for* + (length of time). If the application of this test produces a semantically sound construction, then the verb constellation in question is not an Achievement.

Expressions implying duration such as manner adverbials like *slowly* or *quickly* and completive adverbials like *in an hour* allow an ingressive interpretation of Achievements, as we observe in the following sentences.

(133) They reached the top in 5 minutes.

(134) They slowly reached the top.

This gives still another test for Achievements.

Test 15. Modify the verb constellation by a manner adverbial implying duration such as *slowly* or *quickly* or a completive adverb like *in an hour*. If an ingressive interpretation is permitted, then the situation denoted is possibly an Achievement.

3.2.2.5 Semelfactives

Semelfactives are dynamic, punctual, atelic situations.[33] This type of situation was first described with a complete framework of linguistic aspect by Smith (1991).[34] She explains that Semelfactives, unlike Achievements never have any associated preliminary, nor resultant stages, and in so being, they are the simplest type of event. Semelfactives are constituted of one single stage, with simultaneous initial and final endpoints. The following sentences illustrate.

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[33] The notion of a punctual situation that is atelic is confusing to the authors, but we maintain the definitions in order to keep in line with Smith (1991). Other researchers have induced the explanation that Semelfactives are punctual but do not actually encode endpoints, making them atelic.

[34] Semelfactives were previously described, for example, by Prince (1974).

(135) John coughed (once).

(136) Mary hit Leslie (once).

Because of the above mentioned characteristics of Semelfactives, any modification of these situation types by adverbials involving duration does not express a Semelfactive, but in reality is a derived Activity. The following sentences are Actitivies and not Semelfactives.

(137) John coughed during the whole movie.

(138) Mary hit Leslie all the way to school.

In fact, generally, one will never find any durative construction of denoting a Semelfactive. For that reason, for example, one will also never find a Semelfactive sentence in the progressive tense. The following sentence illustrates an Activity and not a Semelfactive.

(139) Mary was hitting Leslie.

The exception to this rule, explains Smith (1991: 57) are certain adverbials of manner that imply duration such as *slowly* or *quickly*. For example, the following sentences express Semelfactives:

(140) Mary slowly hit Leslie (once).

(141) John quickly coughed (once).

In the first example (140), we see that the speaker wants to express that the action of the hit has been slowed down, whereas in (141), the action has been expressed as sped up.

Because of the punctual nature of Semelfactives, they are compatible with an adverbial construction expressing explicitly a single number in action (as opposed to an undetermined or plural number, or an implicit expression of singularity) such as

ONCE, or *one time*. Accomplishments may also be expressed using such adverbials without any semantic awkwardness; thus, this property is useful in distinguishing Semelfactives from Achievements, once the property of telicity has been established.[35] Consider for example the following sentences denoting Achievements.

(142) *John resolved the problem once.

(143) *Julie recognised her friend once.

(144) *Jennifer lost her watch one time.

The only condition under which such sentences would be semantically not awkward is as an answer to the question *How many times...?* And even then acceptability is questionable. These observations give the following test for Semelfactives.

Test 16. Modify the verb constellation of the sentence by an adverbial expressing singularity such as ONCE, or ONE TIME. If the result of this test is an awkward construction then, the situation type is not a Semelfactive.

Also because of the punctual nature of Semelfactives and the absence of any preceding or resultant stages of the event, all Semelfactives are compatible with adverbials expressing the unexpectedness of the event.

Test 17. Modify the verb constellation by an adverbial expressing the unexpectedness such as *all of a sudden*. If the result is an awkward construction, then the situation type is not a Semelfactive.

These tests are both necessary but insufficient tests for Semelfactives. However, by applying the tests for the other Aspects and getting negative results, one is able to differentiate Semelfactives.

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[35] That is, once it has been established that the denoted situation is not a State nor an Activity.

3.2.3 Viewpoint

The aspectual meaning of sentences is a composite of viewpoint and situation type. These components of aspect, explains Smith, are two independent types of information, whose interaction is a fundamental characteristic of natural language. Smith (1991: 5) gives the following example.

(145) Mary walked to school
(146) Mary was walking to school
(147) Mary walked in the park

In the three sentences in (145)-(147), she affirms, there is one sole situation type: that Mary walked. This situation type is communicated by means of the verb WALK accompanied by its complements. However, these three sentences differ in their aspectual meaning. The first sentence (145) denotes an action that not only has a goal, but has reached its goal. That is, the *walked* has continued all the way *to school* where, as far as the Hearer knows, the *walked* terminated, reaching, as Smith terms it, its natural endpoint; with such a temporal structure (here, the simple past tense), this event is to be considered as complete. As opposed to (145), the sentence (146) denotes an event that does not communicate any information to the Hearer as to whether or not the goal was reached. The Hearer does not know if Mary ended up at school (as a result of her walking there) or not. As such, the aspectual meaning of (146) presents only part of the situation; it is an incomplete event. Finally, sentence (147) does not bring into question the notion of reaching a natural endpoint. This sentence communicates, however, that the event was terminated, and therefore conveys a complete event.

That the three sentences all share the same situation type, but differ in their aspectual meaning is due to their difference of Viewpoint. Viewpoint, explains Smith, communicates to the Hearer a full or partial view of a given situation. Thus, one may see that in (145) and (146) the Speaker conveys a full or complete view of the situation, whereas in (147) the Speaker conveys a partial view. "The viewpoint of

a sentence presents an event with a particular extent and focus, rather as a camera lens may focus (Smith 1991: 5)."

Smith distinguishes three main viewpoint types. First, there is the Perfective viewpoint, which is adopted by the Speaker in order to convey the full view of a situation, that is, to present it as a whole, with initial and final endpoints. Second, there is the Imperfective viewpoint, which serves to allow the Speaker to convey a partial view of a situation—to focus on only a part of a situation, excluding the initial and final endpoints. Finally, Smith explains that there is also the Neutral viewpoint. This viewpoint is particular in that it is flexible, as it includes the initial endpoint of a situation, as well as, for those situations constituted of internal stages, at least one internal stage (Smith 1991: 6). These are illustrated below for English.

The question remains as to how a Speaker chooses the viewpoint under which he would like to present a given situation. Smith explains that this is a grammatical choice. For Smith, grammar encompasses "broadly the system of rules—including lexical, morphological, syntactic, and semantic rules—that generates and structures the sentences of a language (Smith 1991: 6)." And the realisation of these choices is most definitely language-specific. These choices are at the disposal of the Speaker within a closed linguistic system. But a choice must be made as to which viewpoint will be conveyed whenever a sentence is prepared for communication. On the other hand, the expression of situation type within a sentence is not grammaticalised. Smith explains, rather, that situation types are expressed by means of verb phrases of lexical morphemes. These situation types will be discussed in the following section.

Specifically, English has two viewpoint aspects: the perfective and the imperfective. This distinction is based upon the well-known grammatical distinction more traditionally referred to as the distinction between the progressive and the other grammatical tenses.[36] Both of these aspects may be considered as neutral when they are employed under specific sets of verb constellations. Smith explains that the perfective viewpoint is expressible with any situation type; however, this is not the case for the imperfective.

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[36] We use the traditional English appellation of progressive tense (vs. for example simple present).

The perfective viewpoint may be used to express situations of all types. It "presents in its entirety the temporal schema associated with each situation type (Smith 1991: 220)". Thus, whatever situation may be discussed in terms of its completion is presented in its entirety with the perfective viewpoint. In addition, dynamic situations presented from the perfective viewpoint are presented as closed—that is, they are terminated or in the case of Accomplishments and Achievement, they are completed. The following sentences illustrate:

(148) Julie ran to school.

(149) John ran in the park.

(150) Mark coughed.

(151) Leslie solved the problem.

Sentence (148) is an Accomplishment; it is presented as complete. Sentence (149) is an Activity. Though we cannot speak of completeness in this case, the situation is presented as closed, or terminated. Sentence (150) is a Semelfactive, also presented as closed. And finally Sentence (151) is an Achievement, presented as complete.

Stative sentences expressed from the perfective viewpoint are in their natural form; in fact, this is the only viewpoint available to the English Speaker for the expression of States.

Situations may be also presented from the imperfective viewpoint. This viewpoint presents a (telic) situation partially, from an internal perspective, relative to the temporal schema of the situation in question. Expression of a situation from the imperfective viewpoint is carried out in English through use of the progressive tenses. Progressives typically express duration, as well as connotations of dynamism and volition (Smith 1991: 222). Due to this fact, the expression of a Stative, if not completely semantically awkward, is most definitely marked. Smith (1991: 222) explains that such expression of a State presents the state as an event. Moreover, Semelfactives are never presented from the imperfective viewpoint. The following sentences illustrate:

(152) George is loving Jennifer.

(153) *The car is being red.

(154) John is coughing.

Sentence (152) is more of a slang use of the State expressed by the verb *love*, denoting perhaps that George is being amused by Jennifer or a similar event. Sentence (153) is not semantically acceptable; the State 'be red' is not compatible with the progressive. Sentence (154) is not a Semelfactive, but an Activity—the result of the imperfective viewpoint.

Achievements expressed in the progressive—that is, from the imperfective viewpoint—describe the preliminary stages leading up to the Achievement. One should note that when specific verb constellations are available to describe these preliminary stages, the sentence will often be more semantically sound if such terms replace the Achievement. Consider for example the following sentences:

(155) Lewis was solving the problem.

(156) John was reaching the top.

(157) ?Mary was finding her watch.

(158) Mary was looking for her watch.

In examples (155), (156), and (157), the viewpoint focuses on the preliminary stages of the actual Achievement. However, example (157) is odd with the progressive. This is perhaps due to the better substitution of the Activity *look for*, illustrated in (158), denoting directly these preliminary stages of the Achievement *find*.

The expression of Accomplishments from the imperfective viewpoint gives an incomplete aspect. The situation is presented without its terminal endpoint. The following sentence illustrates this.

(159) Jack was writing a book.

Expression in the imperfective viewpoint is most natural to Activities due to their properties of atelicity and dynamism. Since the internal stages of such situations are the same as any other part of these situations (these situations are continuous), there is no question of a partial or incomplete expression of the situation, as can be observed in the following example.

(160) John was walking in the park.

However, the sentence in (160) must be distinguished from the following:

(161) John walked in the park.

The difference is that (161) presents the situation as closed or terminated, whereas in (160) there is no question of the termination the situation; it is left open.

3.3 Problems in Aspect Classification

The aspectual categories are presented as clear-cut categories with specific tests. However, in applying the tests for aspect, one realises that there is perhaps a grey area between the different categories. Smith (1991: 63) recognises the existence of borderline cases. For example, she explains, there are some sentences having properties of both Achievement and Accomplishments, such as sentences with *cool* and *warm*, which are degree predicates in some contexts and present a change of state (with a natural endpoint) in other contexts. The following sentences illustrate this.

(162) The ice melted.
(163) The ice melted in an hour.
(164) The ice melted for an hour.
(165) The soup cooled.
(166) The soup cooled in an hour.

(167) The soup cooled for an hour.

Smith explains that if the process is conceptualised as part of the event, they are Accomplishments, whereas if the process is detachable from the outcome, they are Achievements. The meanings of *melt* and *cool* in examples (162)(162) and (165) could very well be, respectively, 'become melted or more melted' and 'become cool or cooler'.[37] In that sense, these verbs are Achievements. However, it is possible to 'measure out' these verbs, as in examples (163), (164), (166) and (167) (Levin 2000: 7).[38] And when one does so, depending on the boundedness of the measure, these verbs, when considered in these contexts, are either Accomplishments or Achievements—sentences (163) and (166) being the Achievements and sentences (164) and (167) being the Accomplishments. Indeed, it seems that one may 'measure out' a certain part of the meaning: 'become more melted' and 'become cooler'. This makes an iterated event, which is in turn measured out by 'for an hour'.

We have not found such difficult cases in our research; however, our classification was not without its own problems. For this reason, though we are confident with the aspectual classification carried out in our research, we do not exclude the eventuality that another researcher differs in opinion on certain cases. One particular case, where there may be a difference of opinion involves some verbs of the Performative class encountered in the corpus: *praise*, *accuse*, and *deny*.[39/40] In our opinion, these three verbs are Semelfactives. However, we can conceive of the eventuality that a researcher would prefer to call them Achievements. Let us consider the following sentences.[41]

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[37] See Milićević (2003: xvii).

[38] The term *measure out* comes from Tenny (1994: 94-95) and is also described, under a different terminology in Verkuyl (1993: 221-224).

[39] "A performative verb is a verb that names an illocutionary force. It is used in a performative to perform an illuctionary act having that force " (taken from http://www.sil.org/linguistics/GlossaryOfLinguisticTerms/WhatIsAPerformativeVerb.htm). For a discussion of Performative verbs (or Speech Acts) see Austin (1962) or Searle (1969).

[40] Not all verbs of the Performative class behave in this manner, as may be observed of the verb *name*, found in the corpus. For a discussion on the independence of verb class and aspect, see Levin (2000).

[41] We remark that there is a difference between *performative verbs* and *performative occurrences*. The examples (168) to (171), only (168) is a *performative occurrence*, whereas the other examples simply have main verbs belonging to the *performative class of verbs*.

(168) I praise you for your efforts.

(169) I am praising you for your efforts.

(170) I was praising you for your efforts, when you interrupted me rudely.

(171) I only praised you once for your efforts.

Sentence (168) displays the typical behaviour of a Performative. When we use the progressive present tense, as in (169), we encounter ambiguity. This sentence may refer to either the preceding stages before a first praising you, which has not yet occurred, thus displaying the entailment pattern of Achievements. However, on another reading, (169) denotes as situation where praising you is being repeated—that is, we are dealing with a derived Activity from a Semelfactive, which holds the opposite entailment pattern of Achievements. The same observations may be made about (170). Two possible different paraphrase of this sentence are *I was about to praise you for your efforts, when you interrupted me rudely* and *I was praising you and praising you for your efforts, when you interrupted me rudely*, the former paraphrase is the Achievement reading, whereas the latter is the Semelfactive (and derived Activity) reading. Finally, sentence (171) displays typical Semelfactive behaviour of the verb *praise*. The reason why we have decided to call these verbs Semelfactives is that they did not pass all the tests for Achievements, in particular, they do not necessarily have the same entailment pattern.

Chapter 4: Methodology and Results of Research

4.1 Corpus Choice

As discussed in the Introduction, our own research began with the choice of the paraphrase/operation rule to be investigated—Paraphrase Rule 18. In order to make the findings of this research the most objective possible, we decided to apply this rule to existing sentences of a corpus, rather than inventing our own sentences and applying Rule 18 to them. This decision implied the choice of a corpus.

The source of our corpora was four different articles. One article was a scientific (mathematical) article on the modelling of social networks and election processes, the other three articles were shorter journalistic articles.[42] In total, 223 sentences were studied, of which 117 were taken from the scientific article, and 106 from the journalistic articles.

Different types of corpus were chosen for several reasons. Firstly, we wanted to obtain a good representation of a variety of verb tenses. As planned, the scientific article contained mainly sentences with main verbs in the present (simple) tense, whereas the journalistic articles contained mainly verbs in the past tenses. Secondly, we wanted a broad range of verbs to study, and for that range of verbs to reflect as much as possible a broad range of language uses. Indeed, the journalistic articles contain language that is coherent with the regular lexical choices of an average English Speaker. The scientific article, on the other hand, was found to contain some lexical choices particular to the mathematics sublanguage. For example, the following sentences and sentences resembling them would probably never be heard in regular conversation.

(172) The social network smoothes out fluctuations. [95][43]

(173) Decision outcomes derive solely from the opinions of the participating individuals. [102]

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[42] The mathematical article was Rodriguez & Steinbock (2004); the journalistic articles were Associated Press (2005a) and (2005b), Hemming (2005).

[43] This number is the corpus reference number of the sentence as found in Appendix 1.

In addition, we found that certain verbs and Aspects were used more regularly in one type of text as opposed to another.

The most frequent verbs occurring in the corpus were *be* and *say*. Most of the occurrences of the verb *be* were taken from the scientific text (23 of the 26 occurrences), whereas all of the occurrences of the verb *say* were taken from the journalistic articles (in total, 16 occurrences).[44] We must note that any results throughout our research must take into consideration the greater distribution of these two verbs in the corpus. However, it turns out that neither of these two verbs played a major role in the statistics concerning the paraphrases obtained, because sentences containing them were generally not paraphrasable using Paraphrase Rule 18.[45]

Finally, the texts differed in the frequency in their representation of different aspectual categories.[46] Occurrences of Achievements, Accomplishments, and Activities were pretty much equally distributed between the two texts. On the other hand, most of the Statives of our corpus come from the scientific text (48 of the 66 occurrences).[47]

4.2 Application of Paraphrase Rule 18 and Categorisation of Resulting Paraphrases

In this section we will present our results concerning the different types of unacceptable paraphrases found when applying Rule 18 to the sentences in the corpus. First, however, we describe the manner in which we have applied Rule 18. We explain when we have judged that a paraphrase can be attempted. Following this discussion, we identify the different general categories of paraphrases obtained.

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[44] There are no other verbs occurring in the corpus with a comparatively high frequency.
[45] For some cases in which conditions of being paraphrasable by Paraphrase Rule 18 are not met, see section 4.2.
[46] The discussion of the different aspectual categories precedes in Chapter 2.
[47] There were too few Semelfactives to make any generalisation about them and their occurrence in these particular text types.

4.2.1 The Application of Paraphrase Rule 18

The paraphrase operations have been applied in the simplest manner possible. That is, whenever possible, we have avoided the use of any other paraphrase operations in conjunction with the operation being studied. Thus, if a nominalised form of the main verb exists, then we must first examine it before considering a nominal that is a nominalised form of a verb which is a synonym to the main verb. For example, if the main verb were *utilise*, we would first consider the paraphrase using the nominal *utilisation*, before the one using the nominal *use*. We remark, however, that the sentences from our corpus rarely permitted this particular co-occurring paraphrase operation of synonymy. For example, there were many occurrences of the verb *said* in the journalistic corpora. The absence of an acceptable nominal for this verb led us to consider the possibility of use of the nominal *statement*.[48] However, as to *say in a statement* and *to say* are not exact paraphrases, we preferred to admit that there were simply no acceptable paraphrases for sentences having *to say* as their main verb.

4.2.2 Categories of Acceptability

All of the paraphrases are categorised in terms of acceptability. There are two major subcategories of acceptability considered: either a paraphrase is **acceptable** or **unacceptable**. Within the subcategory of acceptable paraphrases, we made another subdivision. Acceptable paraphrases may be judged to be either **good** or **OK**. Thus, there are a total of three (sub)categories of acceptability and unacceptability that we consider.

A paraphrase is considered to be of the category **good** if it is considered by the authors as very natural not only in terms of linguistic production by a native speaker, but also in terms of the native speaker's intuitions concerning what other native speakers would produce—that is, a native speaker would consider sentences belonging to this category as perfect English. For example, the following two sentences are considered to be good paraphrases of one another.

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[48] We were led to consider this as a synonym, because of sentences such as [167] and [170] in Appendix 1, where the context is such that the nominal *statement* should clearly be considered.

(174) The U.S. Bagram air base north of Kabul *cleared* the plane for landing. [209]

(175) The U.S. Bagram air base north of Kabul *gave the plane clearance* for landing.

A paraphrase is considered as **OK** if it is considered somewhat natural in terms of intuitions concerning grammaticality, but not in production; the authors would probably not say such sentences, but in normal conversation they could go unnoticed. For example, the following two sentences are considered to be OK paraphrases of one another.

(176) In figure 1, human A *trusts* B completely. [65]

(177) In figure 1, human A *holds trust in* B completely.

The sentences belonging to the category OK may only be regarded as inferior in acceptability due to levels of frequency in everyday speech, or (conscious or unconscious) personal linguistic preferences on the part of the authors. For instance, the authors have found the following paraphrase (178) of (179) questionable.

(178) Modern political institutions *make utilisation* of representational structures for decision making.

(179) Modern political institutions *utilize* representational structures for decision making. [2]

However, this structure has been found in other corpora.

(180) Around 110 people *made utilisation* of the eight-day rotary camp organised to distribute free artificial limbs. [O1][49]

[49] This number is the reference number of the sentence as found in Appendix 2.

(181) I thus came up with a method, which *makes utilization of* Session and Application variables, and no physical binding to any database server. [O2]

(182) The system *makes utilization of* the WDT timer to store a user defined TPO value, the TPO value is a TOD stamp representing a future state of when the system is to be powered on. [O3]

These are definitely not sentences that would be uttered by the authors, but the reading of such sentences would not call upon any judgement of abnormality.

A paraphrase is considered as **unacceptable** if it is simply unnatural language. The discussion of the different types of unacceptable paraphrases is, in fact, the main goal of this research. As such, the following section is dedicated to that end.

4.2.3 Characteristics of the Category *unacceptable*

Of the 104 attempted paraphrases of the corpus studied, the authors found that 24 belong to the category **unacceptable**. That is, upon application of Paraphrase Rule 18, and supposing there is an available nominal and adequate support verb, a paraphrase is found in this particular research to be unacceptable with a probability of approximately 0.23. This means that almost one quarter of the time, the application of the paraphrase rule produces unwanted results. For this reason, it is interesting to study what has made a paraphrase unacceptable, so that future applications of this paraphrase rule will produce acceptable paraphrase with a higher probability. Many of the reasons will be exposed in this section.

We first explain what is not included in the category unacceptable in addition to those paraphrases that are acceptable. A paraphrase has only been attempted wherever both an adequate support verb and nominal have existed. If either the support verb or the nominal do not exist, we consider there to be analysable

paraphrase possible. [50/51] Thus, the following sentences do not have any analysable paraphrases of the type that interests us here.

(183) Most modern democratic institutions *lie* between these two extremes. [14]

(184) However, this equation *serves the purposes* of our simulation. [56][52]

We may observe that the verb in the first sentence has neither an adequate nominal, nor any conceivable support verb for the (inadequate) gerund nominal. That is, there is no derived nominal that may be considered, and the gerund, *lying*, is certainly inadequate. In addition, we cannot conceive of any plausible support verb for this gerund. The second sentence's main verb does have a plausible nominal (*service* or *serving*), however no adequate support verb can be found.

The category of unacceptable paraphrases encompasses those attempted paraphrases that are unnatural or nonsensical due to semantic or syntactic incompatibilities, as well as those paraphrases that are not sufficiently exact semantically. Some of the common traits of this category among the different Aspects are incompatibilities due to the necessity of an animate grammatical subject, Aspectual mismatches between paraphrases, sentence syntactic structure incompatibilities (including those that are due to the communicative structure of the sentence), the narrowing of the scope or proximity of action and error or vagueness

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[50] We have not studied here the possible explanations as to the existence of a derived nominal. For a study on this topic on Russian Static verbs, see Spencer & Zaretskaya (unpublished).

[51] One may test for the existence of an adequate support verb, by attempting to apply the paraphrase rule. If no adequate verb may be found in this way, we conclude that no adequate support verb exists. In addition, hypotheses about the existence of an adequate support verb have not been explored here. We remark, however, that some main verbs are perhaps semantically too simple, in terms of their semantic composition, to allow themselves to be paraphrased by Rule 18. For more on this latter subject, see Wierzbička (1982).

[52] As discussed, we will not be looking into the reasons for the existence of an adequate support verb. We note, however, that it seems that *serve* here is already a support verb of *purposes*, and this fact may be a factor in the lack of another support verb for this sentence; perhaps there is an incompatibility in the double application of Rule 18. Indeed, a support verb exists in other instances of the verb *serve*, as the following sentences illustrate.

1) This library *serves* the entire community.
2) This library *provides service* to the entire community.

allowance, and the coincidence of a paraphrase with an idiomatic phrase which produces a semantic mismatch. We now pass to the discussion of these items.

4.2.3.1 Animacy

The application of Paraphrase Rule 18 often has been found to call upon the use of a support verb necessitating an animate syntactic subject. Thus, for example, sentence (186) is an unacceptable paraphrase of (185).

(185) Mr. Ranavirajah's admission that aid was failing to reach those in need came as survivors stepped up protests this week saying food rations had not *arrived.* [187]

(186) *Mr. Ranavirajah's admission that aid was failing to reach those in need came as survivors stepped up protests this week saying food rations had not *made their arrival.*

In particular, there are many instances of verbs allowing transitivity alternations, as in the following sentences.

(187) The professor *illustrated* an application of the theorem, by means of an example.

(188) The (professor's) example *illustrated* an application of the theorem.

In these sentences (187) has an animate syntactic subject where as (188) does not. The paraphrase operation applied to (187) will give an acceptable paraphrase, unlike the paraphrase obtained from application of Paraphrase Rule 18 to (188), as one observes in the following two sentences.

(189) The professor *carried out the illustration* of an application of the theorem, by means of an example.

(190) *The (professor's) example *carried out the illustration* of an application of the theorem.

Similar examples found in the corpus are as follows.

(191) This tsunami may *illustrate* the fragility of human life. [151]

(192) *This tsunami may *carry out the illustration* of the fragility of human life.[53]

(193) Decision outcomes *derive* solely from the opinions of the participating individuals. [102]

(194) *Decision outcomes *permit/allow of derivation* solely from the opinions of the participating individuals.

This necessity for an animate grammatical subject is definitely not a generality as the following sentences illustrate.

(195) The parameter merely *scaled* the measure advantage by a constant factor. [87]

(196) The parameter merely *provided a scaling* of the measure advantage by a constant factor.

In sentence (195), the grammatical subject is inanimate and the paraphrase is perfectly acceptable. However, the problem of animacy was significant. Five out of the 24 unacceptable paraphrases had this problem.[54]

[53] This paraphrase attempt was not counted in the results as a better paraphrase was found. See sentence 151 under States in the annexe.

[54] For more examples, see corpus sentences [21], [108], and [210].

4.2.3.2 Incompatibility in Sentence Structure

Sentence structure accounted for four of the 24 unacceptable paraphrases. These incompatible structures found are inversed noun clauses, hidden elliptical structures, and the passive voice, respectively discussed in the following three subsections.

4.2.3.2.1 Fronting and Noun Clauses

There are certain structures which generally seem to be incompatible with the application of Paraphrase Rule 18, and others that are only incompatible with this paraphrase rule under certain circumstances. The fronting[55] of a noun clause structure is definitely a case in which the incompatibility seems to be more general. Let us first consider the following two sentences to illustrate this phenomenon.

(197) 70 percent of survivors have not received anything, Sri Lanka's relief operations chief *acknowledged* this week. [158]

(198) *70 percent of survivors have not received anything, Sri Lanka's relief operations chief *made the acknowledgement* this week.

Sentence (198) is the attempted paraphrase of (197), the paraphrase operation being applied to the dependent clause. Sentence (197) holds the structure of a main independent clause with a nominal dependent clause, however, the normal expression of such a structure is, in fact, inverted here due to the communicative opposition of Theme and Rheme.[56] It seems that sentences involving this fronting are not compatible with Paraphrase Rule 18. Notice however that if the structure had not undergone this inversion then the paraphrase would be acceptable. The following two sentences are perfectly acceptable paraphrases of one another.

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[55] The term *fronting* describes the process by which elements that are usually found after the verb are moved to the beginning of a sentence for communicative reasons. For more on fronting, see Quirk et al. (1980: 407-409).

[56] We will not be discussing the possible effects of the communicative structure of sentences in this thesis. For some indicative sources on this subject, see Mel'čuk (2001) or Hajičová (1994).

(199) Sri Lanka's relief operations chief *acknowledged* this week that 70 percent of survivors have not received anything. [158]

(200) Sri Lanka's relief operations chief *made the acknowledgement* this week that 70 percent of survivors have not received anything.

The following sentences illustrate further this incompatibility.

(201) Sony Ericsson Mobile Communications AB will counter Motorola's introduction yesterday of its first iTunes-compatible cell phone when it unveils a mobile phone-cum-digital music player early next month, company President Miles Flint *announced* at the 3GSM World Congress in Cannes on Monday. [O4]

(202) *Sony Ericsson Mobile Communications AB will counter Motorola's introduction yesterday of its first iTunes-compatible cell phone when it unveils a mobile phone-cum-digital music player early next month, company President Miles Flint *made the announcement* at the 3GSM World Congress in Cannes on Monday.

In the same way, sentences expressing quotations or narrative dialogues should be incompatible with this paraphrase operation.

(203) "Our patience has been rewarded!" *announced* Mr. Wright. [O5]

(204) *"Our patience has been rewarded!" *made the announcement* Mr. Wright.

This is indeed the case as we observe in sentences (203) and (204).

There are two of the 24 unacceptable paraphrases displaying this noun clause incompatibility.

4.2.3.2.2 Hidden Elliptical Structures

The following sentences display a similar behaviour of incompatibility to that of inversed nominal phrases. However, in this case, we are of the opinion that this incompatibility is due to a sort of hidden elliptical structure, perhaps particular of this verb. Let us consider the following sentences.

(205) For our simulation, the method we *choose* is to presuppose the existence of a social network. [51]

(206) *For our simulation, the method we *make the choice* is to presuppose the existence of a social network.

(207) For our simulation, the method we *make the choice to use* is to presuppose the existence of a social network.

The structure of sentence (205) in which the paraphrase has been carried out is the relative clause modifying the nominal phrase. As we observe in the attempted paraphrase (206) and in its comparison with (207), (206) is missing something. This has been found to be the general case with the verb *choose*. However, this is definitely not a generality of this structure with any verbs as the following sentences illustrate.

(208) The people we *trust the most* are old friends.

(209) The people in whom we *have the most trust* are old friends.

(210) The students to whom the professor *assigns* extra homework are slackers.

(211) The students to whom the professor *makes assignments* of extra homework are slackers.

(212) The city I *acknowledge* to be my favourite is Vancouver.

(213) The city (about which) I *make the acknowledgement of* being my favourite is Vancouver.

Indeed, only one of the 24 unacceptable paraphrases displays this incompatibility.

4.2.3.2.3 The Passive Voice[57]

The expression of the passive voice only posed a problem once in the application of Paraphrase Rule 18 throughout our corpus. Consider for example following sentences.

(214) Trust in the real world *is* often *based* on factors other than shared opinions such as relevant expertise. [55]

(215) *Trust in the real world *is* often *given a basis* on factors other than shared opinions such as relevant expertise.

(216) One often *bases* trust in the real world on factors other than shared opinions such as relevant expertise.

(217) One often *gives* trust in the real world *a basis* on factors other than shared opinions such as relevant expertise.

The first sentence is the original sentence as found in the corpus studied. Sentence (216) is the active version of this sentence provided by the authors. We observe that the paraphrase operation applied to (214) gives an unacceptable paraphrase (215), as opposed to when it is applied to (216), resulting in the acceptable paraphrase (217).

In the case of sentence (215), the unacceptability seems to result from the presence of the complement of the nominal *basis*. We observe that by eliminating

[57] We are considering here the verbal undergoing the paraphrase operation to be *be + past participle*, in accordance with Meaning-Text Theory deep syntactic structure, and not only the verb *be*.

this complement or even by putting this complement in the cleft position with a altering of the communicative structure of the sentence, the paraphrase becomes acceptable.

(218) Trust in the real world *is* often *given a basis*.

(219) Those are the factors on which trust in the real world *is* often *given a basis*.

In general, it seems that the passive voice did not have a great influence on the applicability of our paraphrase rule. Of the 19 different attempted passive voice paraphrases found in the studied corpus, only one was unacceptable.

4.2.3.3 Coincidence with Idiomatic Phrase

For some paraphrases, the unacceptability was quite subtle. This is potentially because the paraphrases actually coincided with idiomatic phrases. Consider the following sentences accompanied by their respective paraphrases.

(220) Kam Air financial controller Zimarai Kamgar said the crew *contacted* Peshawar airport. [204]

(221) Kam Air financial controller Zimarai Kamgar said the crew *made contact* with Peshawar airport.

(222) If we instead *use* the social network method (3), the outcome would be 0.75. [81]

(223) If we instead *make use of* the social network method (3), the outcome would be 0.75.

We observe that sentences (220) and (222) are close paraphrases of (221) and (223) respectfully. Indeed, it seems that that the meanings of the paraphrase may be included in those of the original sentences. That is, for example, if (221) is true, then

(220) is true. However, (220) may also be used elliptically to express more information—that there was some sort of (conventional) exchange, for instance, rather than simply an instantaneous contact. The same is true, respectfully, in the case of (222) and (223). (222) may be used to express, for example, that exclusively the social method (3) was used in finding the mentioned outcome, whereas (223) cannot give the same importance to the social network method (3).

Three of the 24 unacceptable paraphrases suffered this incompatibility.[58]

4.2.3.4 Proximity Problems

Proximity problems were extensive among the unacceptable paraphrases. Ten of the 24 unacceptable paraphrases had this type of problem. There are two major types of proximity problems encountered in the corpus: a problem in the altering of the scope of action with relation to the grammatical subject, and a problem in a sort of transference of action from semantic subject to semantic manner adverbial, which we consider to be elliptical expression. These problems are defined and illustrated in the following two subsections.

4.2.3.4.1 Altering of Scope of Action with Relation to GS

In some instances of attempted paraphrasing, we have found that an incompatibility often arises due a sort of altering of the scope of the action in the paraphrase, formally denoted by the main verb of the original sentence. That is, the Speaker is often permitted an original scope of action in uttering the original sentence (the sentence without the nominal), which is altered in the paraphrase. We illustrate by means of the following sentence (224) and its paraphrase (225).

(224) Soon after the disaster, U.S. President George W. Bush *named* his father and Mr. Clinton to head a nationwide private fundraising effort. [123]

[58] The two mentioned, as well as [208].

(225) Soon after the disaster, U.S. President George W. Bush *carried out the naming* of his father and Mr. Clinton to head a nationwide private fundraising effort.

Sentence (224) and (225) are perfectly acceptable by themselves, but they do not express exactly the same meaning. (225) is the attempted paraphrase of (224), but while (224) denotes a situation where Bush actually names his father and Mr. Clinton to a given appointment, (225) could simply mean that Bush oversaw the *naming*, or organised or headed the committee which decided the *naming* of his father and Mr. Clinton to the appointment. Thus, we have an alteration of the scope of the action in the paraphrase. The action of *naming*'s scope is widened in the paraphrase—it is not only fulfilled by Bush alone. Performative sentences seem to have this general property, as discussed in Chapter 3, however they are not the only verbs having such behaviour, as the following sentences illustrate.

(226) Mr. Clinton *has also appealed* with the UN Children's Fund for $45-million to provide clean water and sanitation to tsunami victims.

(227) Mr. Clinton *has also launched* a $45-million *appeal* with the UN Children's Fund to provide clean water and sanitation to t sunami victims. [144]

(228) Kam Air *operates* several domestic routes. [216]

(229) Kam Air *carries out the operation* of several domestic routes.

Attempted paraphrases (227) and (229) suffer from this alteration of scope of action, though grammatical as sentences in and of themselves.

We have not been able to predict when this incompatibility will occur. However, we have observed that probably it should enter into question if the main verb of the original sentence does not denote a mental process or State. For example, the following sentences are good paraphrases.

(230) Nazakat Babayeva *considers* some problems of Azeri's family life in the early middle ages.

(231) Nazakat Babayeva *carries out consideration* of some problems of Azeri's family life in the early middle ages. [O6]

(232) The Working Group's objective was to *consider* of all aspects of transnational corporations affecting human rights, Mr. Guisse said, with the hope that such research efforts would lead to preparation of an instrument that would contain guidelines or binding standards for these corporations.

(233) The Working Group's objective was to *carry out consideration* of all aspects of transnational corporations affecting human rights, Mr. Guisse said, with the hope that such research efforts would lead to preparation of an instrument that would contain guidelines or binding standards for these corporations. [O7]

Here, the main verb is a mental process. Generally, we make the hypothesis that any sentence having a main verb that denotes a situation in which the grammatical subject can participate in a distant manner (by directing the situation, organising the situation and so forth), could possibly have the problem of scope of action upon the application of Paraphrase Rule 18.

Five of the 24 unacceptable paraphrases suffer this incompatibility.[59]

4.2.3.4.1 Transfer of Situation

There are three types of proximity problems under the heading of **transfer of situation**. They will be referred to as (1) the transfer of the grammatical subject problem, (2) the problem in distance of control, and (3) the *provide-be* support verb problem.

[59] Those sentences mentioned already as well as corpus sentences [161] and [188].

4.2.3.4.1.1 The Transfer of Grammatical Subject Problem

Firstly, there is the problem of the transfer of the grammatical subject role from the first semantic argument to that of the adverbial clause modifying the main verb. The following sentences illustrate.

(234) This paper considers "traditional" representative decision-making with a newly proposed method. [23]

(235) *This paper carries out consideration of "traditional" representative decision-making with a newly proposed method.

Sentence (234) is the sort of elliptical version of the following sentence.

(236) The authors consider "traditional" representative decision-making with a newly proposed method.

And we observe that the paraphrase operation may be applied to (236) to obtain an acceptable paraphrase.

(237) The authors carry out consideration of "traditional" representative decision-making with a newly proposed method.

We have only encountered one unacceptable paraphrase of this type in our corpus, and are therefore unable to make broader generalisations. However, we make the hypothesis that with such elliptical forms that are incompatible with paraphrase operation 18, an improvement may be made in applying the paraphrase operation to the non-elliptical form of the sentence.

4.2.3.4.1.2 The Distance of Control Problem

A second problem of this category of unacceptable paraphrases encompasses those in which there is transfer of the action to an official 'object' (document, ceremony, etc.) having for its name, the nominal in question. The following sentences illustrate.

(238) NATO troops searching for the plane *denied* it had been found. [195]

(239) NATO troops searching for the plane *issued a denial* that it had been found.

(240) The number of missing remains 127,749, *stated* the government's National Disaster Relief Coordinating Board. [167]

(241) The number of missing remains 127,749, *said* the government's National Disaster Relief Coordinating Board *in a statement*.

Sentences (239) and (241), though perfectly grammatical, are not exact paraphrases of sentences (238) and (240). They involve the resultative official objects representing the denial and the statement, respectively. Three unacceptable paraphrases are of this type.[60]

4.2.3.4.1.3 The *provide-be* Support Verb Distinction

The third problem of this category refers to those unacceptable paraphrases in which there is an incompatible transfer from an (atelic) stative situation to the affirmation of the presence of a telic situation denoted by a perfective nominal. Consider, for example, the following sentences.

(242) This tsunami may *illustrate* the fragility of human life. [151]

[60] One may also argue that (239) and (241) are more precise or richer than (238) and (240), respectfully.

(243) *This tsunami may *be an illustration* of the fragility of human life.

(244) Figure 1 below *depicts* a simple example showing trust connections among a four node collective. [61]

(245) ?Figure 1 below *is a depiction* of a simple example showing trust connections among a four node collective.

In these sentences, we remark this passage or transfer from one situation to the other. This is also an aspectual incompatibility, and as such, will also be referred to in the next subsection. In counting these attempted paraphrases, there are seven unacceptable paraphrases thought to result from this incompatibility, a significant number (20% of unacceptable paraphrases). However, there are two factors which inhibit this assessment.

Firstly, we have found that though we generally do not find these attempted paraphrases acceptable, they are found to be natural in some scientific sublanguages. For instance, the following three sentences have been encountered in other (medical, mathematical, and physics, respectfully) texts.

(246) Figure 2 *is the illustration of* that model. [O8]

(247) If a $\forall x P(x)$ is false although $P(t)$ is true for every term t, then the universe of the model is to contain such an i that $i \notin \| P \|$ (where $\| P \|$ *is the denotation of* P, a subset of the universe). [O9]

(248) As a final step, recognizing that the integral over y^2 *is the definition of* the beam's area moment of inertia I,

$$I = \int\int y^2 \cdot dy \cdot dz$$

allows us to arrive at the Euler-Bernoulli beam equation, $\frac{d^2}{dx^2}\left[EI\frac{d^2w}{dx^2}\right] = p$. [O10]

For these three sentences, we would have the following reverse paraphrases.

(249) Figure 2 illustrates that model.

(250) If a $\forall x P(x)$ is false although $P(t)$ is true for every term t, then the universe of the model is to contain such an i that $i \notin \| P \|$ (where $\| P \|$ d*enotes* P, a subset of the universe).

(251) As a final step, recognizing that the integral over y^2 *defines* the beam's area moment of inertia I, $I = \int\int y^2 \cdot dy \cdot dz$ allows us to arrive at the Euler-Bernoulli beam equation, $\frac{d^2}{dx^2}\left[EI\frac{d^2w}{dx^2}\right] = p$.

Thus, we must admit that five of the seven attempted paraphrases of this sort are acceptable paraphrases, as they are made within a mathematical text.

Secondly, there is another manner in which paraphrases involving these Statives may be attempted independently of the sublanguage involved. Let us first remark that this third type of proximity problem involves paraphrases with main verbs allowing a transitivity alternation. It seems that in the form *X illustrated Y by/with Z*, these verbs are Accomplishments, whereas in the form *Z illustrates Y*, they are Statives. We observe that the latter use is the resultative form of the former one. With this in mind, let us consider the following two sentences—other attempted paraphrases of sentences (242) and (244), respectfully.

(252) This tsunami may *provide an illustration* of the fragility of human life.

(253) Figure 1 below *provides/shows a depiction* of a simple example showing trust connections among a four node collective.

Paraphrases (252) and (253) are perfectly acceptable. The difference between the attempted paraphrases (243) and (245), and paraphrases (252) and (253) lies exactly in the lack of this proximity problem. Indeed, as discussed in Chapter 3, the Achievement expressed in the present simple tense may denote the resulting state of the actual Achievement. Thus, the verb *provide* permits an aspectually sound paraphrase. This accounts for the other two of the seven paraphrases belonging to this third subcategory.

The question remains as to whether this verb is always the support verb of the nominal. Practically speaking, these paraphrases work well in the studied context; therefore, one is tempted to generally consider such nominals to have support verbs like *provide*. However, this is not always the case with these verbs as observed among the following examples (254), (256), (258), and (260), found in other corpora, accompanied by their paraphrases resulting from an application of Rule 18.

(254) Littlefish Open Source health record Software *embodies* the dream of knowledge-sharing and community-building. [O11][61]

(255) Littlefish Open Source health record Software *is the embodiment* of the dream of knowledge-sharing and community-building.

(256) According to one tradition, recorded from a farm labourer in the Gentleman's Magazine, the figure *is the representation* of a

[61] We observe that though sentence (254) does not have a main verb allowing the transitive alteration previously discussed, it does demonstrate how natural the type of attempted paraphrase being evaluated is in some cases.

Danish giant who had led an invasion of England from the coast.[62] [O12]

(257) According to one tradition, recorded from a farm labourer in the Gentleman's Magazine, the figure *represents* a Danish giant who had led an invasion of England from the coast.

(258) The image of the sphinx *is a depiction* of royal power. [O13]

(259) The image of the sphinx *depicts* of royal power.

(260) The religious procession *is a re-enactment of* the finding of the Holy Cross by Reyna Helena. [O14]

(261) The religious procession *re-enacts* the finding of the Holy Cross by Reyna Helena.

In these sentences, the support verb *provide* would give unacceptable paraphrases. Thus, it is not always clear from the verb alone whether or not the type of support verb necessitated one avoiding the proximity problem. However, as an adequate support verb exists for the sentences found in the corpus studied, we will consider these to be good paraphrases. As a result, we find there to be no unacceptable paraphrases of this third type that cannot be *repaired*.

4.2.3.4 Specifically Aspectual Incompatibilities

In some cases of paraphrasing, the aspect of the original sentence is clearly altered. This situation was demonstrated for Statives in the previous subsection.[63] The

[62] The lexeme *figure* has a different meaning than in sentence (253). Here, the *figure* referred to is an outline of a body in the ground on a hillside.

[63] Depending on the theoretical framework within which one is working, one could potentially consider the proximity problem described in the last section as a problem due to aspect. Indeed, we recognise that there is some sort of situation quantification at work in this problem, and quantification, though not normally in this sense, is considered by many authors (for example, Mel'čuk (1994), Verkuyl (1993), Bennett and Partee (1972)) to be aspectual. As Smith (1991) does not explicitly consider this as aspect, however, we will not be making any conclusions regarding this point.

following sentences illustrate other cases where an altered aspect results from the attempted paraphrase operation.

(262) While we also *studied* the effect of network connectivity, this parameter merely scaled the measured advantage by a constant factor. [86]

(263) While we also *carried out the study of* the effect of network connectivity, this parameter merely scaled the measured advantage by a constant factor.

(264) The use of a social network *dampens* the effect of a particular choice of representatives. [92]

(265) The use of a social network *carries out a dampening of* the effect of a particular choice of representatives.

In sentences (253) and (265), the nominals *study* and *dampening* are both perfective. For both, there is an inherent beginning and end. This becomes even more evident upon consideration of their implication schemes.

If one *was studying*, one *has studied*. However, if one has been *carrying out a study*, it does not imply that one has *carried out a study*. This is the same situation for sentences (264) and (265).

An important remark here is that these aspectual incompatibilities have only potentially resulted from the sentences having a main verb of a sort of atelic aspect—either Activities or States; upon further examination, however, unacceptable applications to States may be repaired as discussed in the previous subsection, which leaves Activities. Probably, the reason for this incompatibility is that all the nominals considered in this study are perfective—they are the only type allowing of expression in the sentential structure that Rule 18 requires. As such, one should probably never encounter such incompatibilities among the telic Aspects.

Making abstraction of the repaired paraphrases, aspectual incompatibilities have occurred in 6 cases of unacceptable paraphrases (25 % of unacceptable paraphrases).[64]

4.2.3.5 Repetition Incompatibilities

In two of the unacceptable paraphrases encountered, the unacceptability stemmed from a forced repetition in the sentences. Both cases were attempts to apply Paraphrase Rule 18 to sentences whose structures were already of the sort resulting from application of this operation to sentences—that is, with a support verb and nominalisation. Consider the following sentence and its paraphrase.

(266) Mr. Clinton *said in a statement* that he looks forward to serving as Mr. Annan's special envoy, starting in March. [121a]

(267) Mr. Clinton *made a statement in a statement* that he looks forward to serving as Mr. Annan's special envoy, starting in March.

The problem is evident. We suspect that most paraphrases of this sort will give unwanted results.

[64] As mentioned, we did not carry out any study of the form of the acceptable paraphrases, however, we remark that there seems to be a correlation between the determination of the nominal form in the resulting paraphrase and aspect. A similar discussion of aspect may be found in Verkuyl (1989) and (1993).

4.3 Nominalisations Available

4.3.1 Vendler's Syntactic Classification of Nominals

4.3.1.1 Complete and Incomplete Nominals

From the point of view of consideration of aspect, there are two types of nominalisations: **complete** (or **perfective**) and **incomplete** (or **imperfective**).[65] These nominalisations are either nominals (a derived nominal or a nominal in gerundive form), or noun phrases containing a nominal. This distinction stems from Vendler (1968)'s findings. In fact, Vendler suggests the existence of an aspectual category distinction between perfective an imperfective nominals corresponding to their respective appellations. Perfective nominals are those nominalised forms which have lost their verbal characteristics, thus behaving like typical nouns, and denoting a perfective situation. Imperfective nominals, on the other hand, are those nominals that can occur externally in noun phrase positions while holding an internal syntactic structure similar to that of the verb phrase from which they are derived, and denoting an imperfective situation. They have five defining characteristics regarding their occurrence in language, which distinguish them from perfective nominals.

1. Imperfective nominals occur with determiners.
2. Imperfective nominals can be modified by adjectives, but not by adverbs.
3. Imperfective nominals cannot appear in different tenses.
4. Imperfective nominals cannot be modalised.
5. Imperfective nominals cannot be negated.

The following respective sentences illustrate this behaviour. The first five sentences contain perfective nominals, while the last five contain imperfective nominals (in italics).

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[65] These categories have also been given the appellations of perfect and imperfect. We have decided to use the terms perfective and imperfective, because they are more coherent with the rest of the terminology used throughout this thesis, and in particular, with Carlotta Smith (1991)'s terminology.

(268) *The singing of the opera* was beautiful.

(269) *The beautiful singing of the opera* moved the audience.

(270) **The having sung of the opera* was beautiful.

(271) **The being able to sing of the opera* is quite a talent.

(272) **The not singing of the opera* did not make for a bad evening.

(273) **The singing the opera* was beautiful.

(274) **The beautiful singing the opera* moved the audience.

(275) *Judy's having sung the opera* flawlessly surprised her peers.

(276) *Judy's being able to sing the opera* flawlessly surprised her peers.

(277) *Judy's not singing the opera flawlessly* surprised her peers.

In the examples of perfective and imperfective nominals, we have chosen one type of each to illustrate: the Ing-of gerund for the perfective nominals, and the Poss-ing gerund for the imperfective nominals. However, these categories of nominals include much more, as Abney (1987) describes. Firstly, derived nominals are all perfective nominals. However, gerunds may be separated into four different types of nominals depending on their syntactic co-occurrences. Abney (1987) calls these nominals (1) Acc-ing gerunds, (2) PRO-ing gerunds, (3) Poss-ing gerunds, and (4) Ing-of gerunds. The following sentences illustrate respectively.

(278)	Judy singing the opera	(Acc-ing gerund)
(279)	singing the opera	(PRO-ing gerund)
(280)	Judy's singing the opera	(Poss-ing gerund)
(281)	singing of the opera	(Ing-of gerund)

Of these gerunds, Hamm & van Lambalgen (2002) observe along with Abney (1987) after Vendler (1968) that only derived nominals and Ing-of gerunds make up the class of perfective nominals, where as Acc-ing gerunds, PRO-ing gerunds and Poss-ing gerunds make up the class of imperfective nominals.

4.3.1.2 Narrow and Loose Containers

Vendler (1968), followed by Abney (1987), explains that there are distinct and sometimes exclusive verbal contexts or containers in which either class of nominals may be employed. Abney (1987) refers to these contexts as either **loose containers** or **narrow containers**, according to whether both kinds of nominals may be used in such a context (making it a loose container), or only perfective nominals may be used in such a context (making it a narrow container). For example, expressions like *surprised us* and *is unlikely* are loose containers (Hamm & van Lambalgen (2002: 3)), so they accept either type of nominal, as the following sentences illustrate.

(282) Judy's buying a house surprised us.
(283) Judy's buying of a house is unlikely.
(284) The delightful singing of the song surprised us.
(285) A delightful singing of the song is unlikely.

On the other hand, expressions like *was slow* and *occurred* are examples of narrow containers (Hamm & van Lambalgen (2002: 3)), as we may observe in the following sentences.

(286) *Judy's buying a house occurred on Tuesday.
(287) *John's driving the car was slow.
(288) Judy's buying of a house occurred on Tuesday.
(289) John's driving of the car was slow.

Throughout our research, we have found that the verbal context in which Paraphrase Rule 18 is carried out results in a narrow container. That is, only perfective nominals may occur in resulting paraphrases from the application of Rule 18. The following sentences provide a small example of this.

(290) The government *suspended* two officials for mishandling relief.[66]

(291) The government *carried out the suspension of* two officials for mishandling relief.

(292) *The government *carried out suspending* two officials for mishandling relief.

Thus, in our research we have considered only perfective nominals.

4.3.2 Semantic Types of Perfective Nominals Available

The importance of the type of nominal in the acceptability of the paraphrase varies from one aspect to another. It seems that the importance of the type of nominal in paraphrase acceptability is virtually nonexistent for Semelfactives and Accomplishments. In addition, there seems to be only one possible type of nominal for States. On the other hand, the type of nominal does seem to play an important role in paraphrase acceptability for Achievements and Activities.

According to our findings in the data, there are three possibilities for the nominal used in the paraphrase.[67] The nominal may describe the previous stages of the event and the endpoint, or simply the endpoint. Consider, for example, the following sentences.

(293) We carry out an application of (2) to get an expected decision of 0.75.

(294) B carries out an unequal division of trust.

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[66] Corpus sentence (155).

[67] For further discussion of types of nominalisations, see for example, Alexiadou (2001) or Grimshaw (1990).

In these sentences, the nominals *application* and *division* denote the process and endpoints of the respective situations. This contrasts with the denotation of the nominals in the following sentences.

(295) Note how this gives an implication of a kind of conservation of energy.

(296) The government made a pledge to investigate 10 others on similar charges.

Sentences (295) and (296) have nominals which express the resulting (abstract or concrete) 'object' of the corresponding situation. That is, in the context of these sentences if a fact X implies Y, this situation results in an implication. Similarly, if *X pledges Y*, then a *pledge of Y* results. This behaviour is similar to that of performative verbs, discussed in the section on Semelfactives of this chapter.

Another type of nominal considered due to one particular sentence appearing in the corpus, but which, in the end is not studied, due to the simultaneous availability of a nominal of the first type, are particular of denominal verbs. Thus, the verb *to water* may be paraphrased by *to give water* and *to weight* may be paraphrased by *to give a weight*. This latter verb was found in a sentence of our corpus.

(297) Participants' opinions are unequally weighted.[68]

However, for such verbs, the nominal of the first type also exists in the gerundive form.

(298) Participants' opinions are given an unequal weighting.

This paraphrase is perfectly acceptable. In our opinion, this is a general fact for such verbs. Thus, these nominals will not be considered in this study.

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[68] Corpus sentence (46).

Nominals describing the (preceding) process and/or endpoint of the corresponding situation will be called Type 1 nominals in this thesis. The nominals denoting the resulting 'object' will be called Type 2 nominals.

Let us remark that it is often possible to employ a nominal capable of being either Type 1 or Type 2. Consider the following sentences.

(299) B carries out an unequal division of trust between C and D.

(300) B makes an unequal division of trust between C and D.

Here, the nominal in (299) is of Type 1, as already mentioned, whereas the nominal in (300) is of Type 2. The difference is subtle but crucial to the acceptability of the paraphrase in many instances. Let us consider, for example the following original sentence from which the paraphrases (299) and (300) stem.

(301) B divides trust unequally between C and D. [66]

We observe that though both sentences (299) and (300) are perfectly grammatical, sentence (299) seems to be the true paraphrase of (301). Sentence (300) is too durative to convey the same aspectual meaning conveyed in (301). The question follows as to how to choose between the two nominals when applying the paraphrase operation. We have found that in the cases where one has the option, that is, where the nominal with such an ambiguity exists and the adequate support verb also exists, that the paraphrase with the nominal of Type 2 is the better paraphrase for Achievements and the paraphrase with nominal of Type 1 for Activities. However, even when the nominal exists, the adequate support verb need not exist, as is the case in the following sentences.

(302) The government suspended two officials for mishandling relief funds. [155]

(303) The government carried out the suspension of two officials for mishandling relief funds.

(304) ?The government declared the suspension of two officials for mishandling relief funds.

Sentence (302) is the original sentence. Sentence (303) is the paraphrase using a nominal of Type 1. Sentence (304) is an attempt at a paraphrase using a nominal of Type 2, however the support verb is not adequate and we have not been able to find one that is here.

4.3.3 Comments on the Support Verb Employed

Generally we have found that when the verb constellation of the corpus sentence is telic, the support verbs used are generally also telic—either Achievements or Accomplishments. This is a predictable result. However, we have observed one characteristic of some of these paraphrases, with regard to their support verbs, that is worth mentioning. In fact, it corresponds with a distribution of the types of support verbs used.

The most used support verbs for this operation with Achievements and Accomplishments were *give*, *make* and *carry out*.[69] It is interesting to note first of all that *give* and *make* are both Achievements in the context used. In particular, we have noticed that these verbs were used more frequently, in the paraphrasing of Achievement, with Type 2 nominals. On the other hand, the verb *carry out* (something) is an Accomplishment. This verb, in particular, was used exclusively with type 1 nominals among all Aspects. In addition, whenever Activities were paraphrased using *carry out*, five out of six times, an unacceptable result ensued; two of these times there was an aspectual incompatibility, and the other three times there was a transfer of situation.[70] These observations lead to two hypotheses.

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[69] In our particular paraphrases, the support verb *carry out* was used eight times for Accomplishments and five times for Achievements. The support verb *make* was used 17 times for Achievements and four times for Accomplishments. The support verb *give* was used eight times for Accomplishments and 10 times for Achievements. No other support verbs came close to this frequency of usage.

[70] See Corpus sentences (86) and (92) for the aspectual incompatibilities, and sentences (23), (188), (216) for the transfer of situation problem.

Firstly, Type 2 nominals used in paraphrases of Achievements seem to require Achievement support verbs in Achievement paraphrases.[71] Secondly, one may postulate that in Accomplishment paraphrases, the perfective nominal is the endpoint of the situation. We illustrate this second point with the following sentences.

(305) We *carry out an application* of (2) to get an expected decision of 0.75.

In this sentence, the *application* is the endpoint in question. For this reason, one risks an aspectual incompatibility in using this support verb to paraphrase an Activity, whereas the Accomplishment is expressed quite naturally with this support verb.[72] Any other hypothesis about the support verbs used and their role in the paraphrases is unclear to the authors.

4.4 General Statistics[73]

In our corpus, for 104 of the 223 sentences, both a nominal and adequate support verb available for the application of Paraphrase Rule 18 (47 % of the corpus). Of these 104 sentences, 24 were considered unacceptable (23 %). The majority of the verbs appearing in our corpus were telic verbs (mainly Achievements and Accomplishments).

4.4.1 Achievements

A total of 73 Achievements appeared in our corpus. Of these 73 sentences, only 42 had the necessary elements allowing an attempt at application of the paraphrase operation. Of these 42 potential paraphrases, 24 are considered acceptable (20 are considered good paraphrases, 11 OK) and 11 unacceptable.

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[71] Probably due to the natural expression of resultative situations by Achievements.
[72] An Accomplishment paraphrased using this support was considered good 7 out of the 8 times occurrences.
[73] We do not make any statement about the statistical significance of these findings. These figures represent simple frequencies of the phenomena as found in our analysis.

Two types of nominals were employed in these paraphrases—nominals of Types 1 and 2. Of the 42 potential paraphrases, 14 were carried out using nominals of Type 1 and 28 of type 2. In our corpus, we found that a paraphrase of a sentence of the Achievement aspect is most likely to be good (perfectly acceptable) if the nominal employed is of Type 1—with a probability of 0.79. A paraphrase using a nominal of Type 2 is simply acceptable with a probability of 0.71. The statistics are given in the table below.

Nominal Type	**Acceptable**		**Unacceptable**
	Good	***OK***	
Type 1	0.79 (11/14)	0	0.21 (3/14)
Type 2	0.32 (9/28)	0.39 (11/28)	0.29 (8/28)

Figure 2: Table of statistics for Achievement paraphrases

4.4.2 Activities

Of the 223 sentences of the corpus, 35 were Activities (16 %). Of those 35 Activities, we could only attempt the paraphrase operation on 18 sentences (51 %). The paraphrase operation resulted in an acceptable paraphrase for 12 out 18 sentences (67 %). In addition, among the 18 attempted paraphrases, 12 employed a Type 1 nominal and 6 employed a Type 2 nominal. This is definitely in contrast to the use of nominals in Achievement sentences' paraphrases. We found that the paraphrase of a sentence of Activity aspect, having an adequate support verb and a nominal of Type 1, will most frequently be acceptable, with a probability of 0.75. The statistics of for the results of the test on Activities is in the table below.

Nominal Type	Acceptable		Unacceptable
	Good	*OK*	
Type 1	0.42 (5/12)	0.33 (4/12)	0.25 (3/12)
Type 2	0	0.5 (3/6)	0.5 (3/6)

Figure 3 : Table of statistics for Activity paraphrases

4.4.3 States

Sentences expressing the States were definitely the most restrictive not only in their allowance of acceptable paraphrases, but in their allowance of an attempt at application of Paraphrase Rule 18. There were 66 States found in the corpus (30 % of 223 sentences). Of these 66 sentences, we were only able to attempt a paraphrase operation on 16 sentences (24 %). In addition, of these 16 sentences, all paraphrases were acceptable.

An interesting characteristic of the nominals in the attempted paraphrases of Stative sentences is that all of them are of Type 2. In addition, the most common support verb for States was *have* (or *held*).[74] The following table gives the statistics of the test for Statives.

Nominal Type	Acceptable		Unacceptable
	Good	*OK*	
Type 1	0	0	0
Type 2	1 (16/16)	0	0

Figure 4: Table of statistics for States paraphrases

[74] These support verbs were interchangeable in the context.

4.4.4 Accomplishments

Accomplishments occurred in the corpus 46 times (20.6% of the 223 sentences). Of these 46 occurrences, we were only able to apply Paraphrase Rule 18 to 22 Accomplishments (49 %). A paraphrase of an Accomplishment was acceptable 16 times out of the 22. More frequently, these acceptable paraphrases were with nominals of Type 1 (62.5 %), but this is not significantly higher than the acceptable paraphrases with nominals of Type 2 (37.5 %), given the number of sentences we are working with. The statistics of the results of the application of Paraphrase Rule 18 to the Accomplishments of our corpus are listed in the table below.

Nominal Type	**Acceptable**		**Unacceptable**
	Good	***OK***	
Type 1	0.58 (7/12)	0.25 (3/12)	0.17 (2/12)
Type 2	0.5 (5/10)	0.1 (1/10)	0.4 (4/10)

Figure 5: Table of statistics for Accomplishment paraphrases

4.4.5 Semelfactives

Semelfactives make up the category the most underrepresented in this study. Of the 223 sentences in the corpus, only six sentences were Semelfactives. We were able to apply the paraphrase operation to all of these sentences. Of these six sentences, five were acceptable. Based on the data, we were unable to obtain many results on the application of Paraphrase Rule 18 to sentences of the Semelfactive aspect.

Acceptable		Unacceptable
Good	*OK*	
0.83 (5/6)	0	0.17 (1/6)

Figure 6: Table of statistics for Semelfactive paraphrases

4.4.6 Summary Table of Distribution

Aspect	Acceptable (80)		Unacceptable (24)
	Good (49)	*OK* (31)	
Achievements	20	11	11
Activities	5	7	6
Statives	7	9	0
Accomplishments	12	4	6
Semelfactives	5	0	1

Figure 7 : Summary Table of Distribution

4.4.7 Misleading Factors of the Corpus Influencing the Analysis

Certain verbs appeared more frequently than others among the sentences of the corpus. However, two verbs in particular occurred with such a significant frequency, that they may mislead in terms of conclusions about the applicability of Rule 18. Indeed, the verb *be* occurs in 26 of the 220 sentences, making it the most frequent verb encountered; 23 of the 26 occurrences were taken from our scientific text. The next most frequent verb, *said* occurred 16 times in the corpus, all of which were taken from the journalistic texts. There were no other verbs that came close to the frequency of these two. In total, these sentences having as main verb either of these two verbs make up 20% of the sentences of our corpus. In addition, such sentences

were not paraphrasable by using Rule 18. Thus, one observes that in counting only one occurrence of either of these verbs, the rate of success in the application of Rule 18 rises significantly.

Chapter 5: Conclusion

5.1 Summary of Results

We have found eleven different types of problems in paraphrases resulting from the application of Paraphrase Rule 18. Four major categories of unacceptable paraphrases referred to paraphrases whose unacceptability stemmed from syntactic properties, having to do with the requirement of animacy of the grammatical subject, and incompatibilities in sentence structure including fronting and noun clauses, hidden elliptical structures, and the passive voice. Two categories of unacceptable paraphrases were built on properties that were less structural and more due to interference problems for the comprehension of the sentence. Paraphrases belonging to them were unacceptable due to coinciding idiomatic phrases or repetition incompatibilities. The other five categories of unacceptable paraphrases covered problems found among unacceptable paraphrases that were essentially due to semantic incompatibilities; thus these attempted paraphrases manifested either incompatibility between lexical meanings of the resulting paraphrase or an alteration of meaning from the original corpus sentence to the resulting paraphrase. These categories were based on proximity problems in the altering of the scope of action with relation to the grammatical subject and transfer of situation problems such as the transfer of the grammatical subject problem, the distance of control problem, and the *provide-be* support verb distinction, and, of course aspectual incompatibilities. In particular, we found, as predicted, that aspectual incompatibilities may result from the application Paraphrase Rule 18, especially with Activities, because of the potentially telic property of the resulting form. In terms of numerical occurrences, however, the most serious type of problem among unacceptable paraphrases resulting from this paraphrase operation was the proximity problem, discussed in section 4.2.3.4.

Though we were able to uncover some problems in aspectual correlation between the original corpus sentence and its paraphrase, we were unable to make serious predictions about the role of Aspect in controlling the acceptability of paraphrases by Rule 18. However, the work of this thesis does indicate new

directions and lay the groundwork for future study of this and other similar paraphrase rules.

5.2 Questions for Future Research

With a larger corpus, one may possibly apply the information obtained in our research to the study of the applicability conditions of Rule 18; that is, one may possibly construct the set of conditions which predict when the application of Rule 18 to an arbitrary sentence will produce acceptable results or unacceptable results.

The manner in which these conditions may be studied could be from several different viewpoints. Firstly, there is the role of semantic oppositions such as Aspect in these predictions. For the moment, we are not sure of the extent to which Aspect would be useful in the prediction of acceptability. Based on the statistics, we would expect that if a State has an adequate support verb and nominalisation, then probably, the paraphrase would be acceptable. Also, we predict that many Activities will be open to aspectual incompatibilities for the reasons mentioned in section 4.2.3.4, but as the Statistics show, there are also many Activities that are perfectly paraphrasable by Rule 18. Much more data is required to determine Aspect's full role here.

Another manner in which to carry out a study on these acceptability conditions would be to explore lexical categories based on either syntactic behaviour, or based on semantic meaning. For instance, in terms of syntactic behaviour, we found that one category of verbs allowing a transitive alternation is potentially susceptible to the animacy problem, as discussed in section 4.2.3.1.[75] However, we cannot tell with what frequency such a problem will arise. Nor do we know the extent to which the syntactic behaviour of verbs will be important in discovering the applicability conditions of Rule 18. Also, in terms of lexical semantic distinctions among verbs, we cannot tell how important semantic categories such as the category of verbs of movement, or of verbs of thought processes, will be in determining these applicability conditions.

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[75] The category of these verbs, as well as many other syntactic categories, is discussed in Levin (1993).

We have also not studied the likelihood of obtaining an acceptable paraphrase for a given sentence with a particular main verb, once an acceptable paraphrase has already been found for another sentence with that same main verb in another context. Indeed, sentences with the main verb *denote*, were found to always be perfectly paraphrasable, and sentences with the main verb *make* were found to never be paraphrasable. On the other hand, we have found two cases of the main verb *serve*, one in which it is perfectly paraphrasable, and another in which the paraphrase obtained is unacceptable.[76] Thus, we do not think that this manner of proceeding will always be useful. However, we predict that within a particular text, the likelihood can be much better than in general. Moreover, we think that within a particular sublanguage, such predictions could be very useful.

[76] See section 4.2.3.

Appendix 1: The Corpus Studied[77]

Achievements

General Count	Reference Number Sentence in Corpus	Para-phrase Count	Corpus Sentence	Attempted Paraphrase	Acceptability Judgement[78] & Nominal Type[79]
1.	7	1	*[Collective decision-making] **is supported** by a system of rules...*	*[Collective decision-making] **is given support** by (means of) a system of rules...*	• **P-1** • **GOOD-1**
2.	8	*	*An overload problem **occurs** when a collective does not have the information-processing infrastructure to support the active participation of all its constituent members...*	*	*
3.	9	2	*To overcome this issue, societies **have come to approximate** full participation by using a set of decision-making representatives.*	*To overcome this issue, societies **have come to make an approximation of** full participation by using a set of decision-making representatives.*	• **R-1** • **GOOD-2**
4.	15	3	*...the current resident population of the United States **is estimated** by the U.S. Census Bureau to be approximately 293 million...*	*...the current resident population of the United States **is given an estimation** by the U.S. Census Bureau **of** approximately 293 million...*	• **R-2** • **GOOD-3**
5.	16	*	*...the size of the U.S. congress **is fixed** by law at 535 members.*	*	*
6.	17	*	*This **gives** a representation ratio of approximately one*	*	*

[77] Sentences 1 through 117 are taken from the scientific article Steinbock and Rodriguez (2004). Sentence 118 through 220 are taken from the journalistic articles by Associated Press (2005a), (2005b) and Hemming (2005).

[78] Acceptable (Good, OK), and Unacceptable (Other), in the form "judgment"-count.

[79] P (Type 1), R (Type 2), in the form Type-count.

			policy-maker per 547,000 citizens.		
7.	21	4	*...the architecture of the congressional meeting chamber* ***permits*** *only a limited number of seats.*	*?...the architecture of the congressional meeting chamber* ***gives/grants permission*** *for only a limited number of seats.*	• **R-3** • **OTHER-1** (animacy 1)
8.	22	*	*As human population increases, and the ratio of representation grows more sever, such artificial constrains on the policy-making infrastructure of a society* ***become*** *increasingly disabling*	*	*
9.	27	*	*[First we]* ***give*** *[the proposed method's] mathematical formalization.*	*	*
10.	32	5	*The simulation* ***defines*** *an individual* ***as*** *a node within a social network.*	*The simulation* ***gives the definition of*** *an individual as a node within a social network.*	• **R-4** • **OK-1**
•	33	6	*Each individual node* ***is assigned*** *an "opinion" value from a uniform distribution between 0.0 and 1.0.*	*Each individual node* ***is provided an assignment of*** *an "opinion" value from a uniform distribution between 0.0 and 1.0.*	• **R-5** • **OK-2**
•	38	7	*Equation (1)* ***defines*** *a decision outcome as the average of representatives' opinion values.*	*Equation (1)* ***gives the definition of*** *a decision outcome as the average of representatives' opinion values.*	• **R-6** • **OK-3**
11.	39	*	*Equation (2)* ***gives*** *the expected decision outcome...*	*	*
12.	46	8	*...participants' opinions* ***are unequally weighted****...*	*...participants' opinions* ***are given an unequal weighting****...*	• **P-2** • **GOOD-4**
13.	51	9	*...the method we* ***choose*** *to assign*	*?...the method we* ***make the choice*** *to assign these*	• **R-7**

			these weights is to presuppose the existence of a social network...	*weights is to presuppose the existence of a social network...*	• **OTHER-2** (noun clause 1)
14.	52	10	*The following equation **defines** the amount of trust individual p has in individual q.*	*The following equation **gives a definition of** the amount of trust individual p has in individual q.*	• **R-8** • **OK-4**
•	53	11	*According to (4) similarity of opinions **implies** a symmetric trust relationship.*	*According to (4) similarity of opinions **makes the implication of** a symmetric trust relationship.*	• **R-9** • **OK-5**
15.	55	12	*[trust in the real world] **is** often **based** on factors other than shared opinions such as relevant expertise.*	*?[trust in the real world] **is** often **given a basis** on factors other than shared opinions such as relevant expertise.*	• **R-10** • **OTHER-3** (passive-1)
16.	57	13	*Trust values **are assigned** as edge-weights on the directed edges of the social network.*	*Trust values **are given** edge-weights **assignments** on the directed edges of the social network*	• **R-11** • **OK-6**
17.	62	*	*The weight of each active node's opinion when calculating decision outcomes in (3) **follows** directly from the trust given them by non-active nodes.*	*	*
18.	66	14	*...B **divides** trust unequally between C and D.*	*... B **makes an** unequal **division of** trust (unequally) between C and D.* *(...B **carries out an** unequal **division of** trust (unequally) between C and D.)*	• **R-12** • **GOOD-5**
19.	68	*	*...each node **is** initially **given** one unit of trust...*	*	*
•	73	15	*Note how this **implies** a kind of conservation of energy.*	*Note how this **gives an implication** of a kind of conservation of energy.*	• **R-13** • **OK-7**
20.	77	16	*...we **apply** (2) to get an expected decision of 0.75.*	*...we **carry out an application of** (2) to get an expected decision of 0.75.*	• **P-3** • **GOOD-6**

21.	80	*	*...this **gives** an error of 0.05.*	*	
•	87	17	*...this parameter merely **scaled** the measure advantage by a constant factor.*	*...this parameter merely **provided/carried out a scaling of** the measure advantage by a constant factor.*	• **P-4** • **GOOD-7**
•	90	18	*...supplementing the traditional method with a social trust network for weighting the opinions of representatives **resulted** in a large decrease in decision error.*	*...supplementing the traditional method with a social trust network for weighting the opinions of representatives **ended in a result of** a large decrease in decision error.*	• **R-14** • **OK-8**
22.	93	*	*...the traditional method **makes** choosing representatives critical to the decision outcome...*	*	*
23.	96	*	*...which particular subset of the population **is making** decisions for the whole.*	*	*
24.	97	*	*...collective decisions **are** often **made** by a subset of the population...*	*	*
25.	98	*	*...this **amounts to** portioning the collective into two sets...*	*	*
26.	103	19	*...this method **results** in an exponential increase in decision error...*	*...this method **ends in a result of** an exponential increase in decision error...*	• **R-15** • **OK-9**
•	104	20	*...the simulation **indicates** that this increase in error ...*	*...the simulation **provides an indication** that this increase in error ...*	• **R-16** • **GOOD-8**
27.	108	21	*It **offers** a way to maintain a relatively stable approximation of collective opinion...*	**It makes an offer for** a way to maintain a relatively stable approximation of collective opinion...*	• **R-17** • **OTHER-4** (animacy 2)

28.	118	22	*...Kofi Annan **selected** former U.S. president Bill Clinton yesterday to be the Unitied Nations point man for tsunami reconstruction.*	*...Kofi Annan **made the selection of** former U.S. president Bill Clinton yesterday to be the Unitied Nations point man for tsunami reconstruction.*	• **R-18** • **OK-10**
•	123	23	*Soon after the disaster, U.S. President George W. Bush **named** his father and Mr.Clinton to head a nationwide private fundraising effort...*	**Soon after the disaster, U.S. President George W. Bush **carried out the naming of** his father and Mr.Clinton to head a nationwide private fundraising effort...*	• **P-5** • **OTHER-5** (proximity 1): wide 1
29.	125	*	*The disaster **killed** more than 157, 000 people and displaced millions of others in 11 countries.*	*	*
30.	129	*	*This **would give** Mr.Clinton a chance to use his political skills to tackle the long-standing conflicts between ...*	*	*
31.	135	*	*Mr. Annan and Mr. Clinton have decided that a formal announcement and joint appearance **will take place**...*	*	*
32.	136	24	*...after the former president **returns** from the region later this month.*	*...after the former president **makes his return** from the region later this month.*	• **P-6** • **GOOD-9**
33.	141	25	*...Mr. Clinton said that more than one-third of a billion dollars **had already been donated** to U.S. chairities...*	*...Mr. Clinton said that more than one-third of a billion dollars **had already been made/given in donations** to U.S. chairities...*	• **R-19** • **GOOD-10**
34.	144a	26	*Mr.Clinton **has also launched a $45-million appeal** with the UN Children's Fund to provide*	*Mr.Clinton **has also carried out the (*launch)/launching**(28) **of a $45-million appeal***	• **P-7** • **GOOD-11**

			clean water and sanitation to tsunami victims.		
35.	144b	27	*Mr.Clinton* ***has also launched a $45-million appeal*** *with the UN Children's Fund to provide clean water and sanitation to tsunami victims.*	**Mr.Clinton* ***has also appealed*** *with the UN Children's Fund* ***for $45-million*** *to provide clean water and sanitation to tsunami victims.*(27)	• **R-20** • **OTHER-6** (proximity 2: wide 2)
36.	146	*	*...to* ***make sure*** *that we do everything we can to keep people alive...*	*	*
•	150	28	*...at the World Economic Forum in Davos, Switzerland,* ***which ended*** *Sunday.*	*...at the World Economic Forum in Davos, Switzerland, which* ***came to an end*** *Sunday.*	• **P-8** • **GOOD-12**
•	154	29	*About 400 survivors of southern Asia's tsunami* ***blocked*** *a Sri Lankan road on Friday to protest against corrupt aid distribution.*	*About 400 survivors of southern Asia's tsunami* ***participated in the blockade/blocking of*** *a Sri Lankan road on Friday to protest against corrupt aid distribution.*	• **P-9** • **GOOD-13**
•	155	30	*The government* ***suspended*** *two officials for mishandling relief...*	*The government* ***carried out the suspension of*** *two officials for mishandling relief...*	• **P-10** • **GOOD-14**
37.	156	31	*[The government]* ***pledged*** *to investigate 10 others on similar charges.*	*[The government]* ***made a pledge*** *to investigate 10 others on similar charges.*	• **R-21** • **GOOD-15**
38.	157	*	*...70 per cent of survivors* ***have not received*** *anything because of bureaucratic bungling and incompetence...*	*	*
39.	158	32	*...Sri Lanka's relief operations chief* ***acknowledged*** *this week.*	**...Sri Lanka's relief operations chief* ***made the acknowledgement*** *this week.*	• **R-22** • **OTHER-7** (noun clause 2)
40.	160	*	*Indonesia* ***suffered*** *the*	*	*

			highest death toll, with at least 112,279 victims.		
41.	162	*	*...foreign troops who spearheaded emergency operations* ***began*** *leaving.*	*	*
42.	165	33	*...[with] Australia saying its troops* ***would withdraw*** *in a few weeks.*	*...[with] Australia saying its troops* ***would (complete/begin/)carry out a withdrawal*** *in a few weeks.*	• **P-11** • **GOOD-16**
•	166	34	*In Banda Aceh, Indonesian workers cleaning up debris* ***found*** *1,108 more bodies,...*	*In Banda Aceh, Indonesian workers cleaning up debris* ***made the finding of*** *1,108 more bodies,...*	• **R-23** • **OK-11**
43.	181	35	*The two "****have been suspended*** *from work with immediate effect," Mr. Weerakoon said...*	*The two "****have been subjected to suspension*** *from work with immediate effect," Mr. Weerakoon said...*	• **P-12** • **GOOD-17**
44.	183	36	*Thilak Ranavirajah,...,* ***appointed*** *a special task force Thursday to ensure that supplies reach all tsunami victims, at least by Feb. 15.*	*Thilak Ranavirajah,...,* ***made the appointment of*** *a special task force Thursday to ensure that supplies reach all tsunami victims, at least by Feb. 15.*	• **R-24** • **GOOD-18**
45.	184	*	*Mr. Ranavirajah's admission that aid was failing to reach those in need* ***came*** *as survivors stepped up protests this week saying food rations had not arrived.*	*	*
46.	187	37	*Mr. Ranavirajah's admission that aid was failing to reach those in need came as survivors stepped up protests this week saying food rations had not* ***arrived****.*	*?Mr. Ranavirajah's admission that aid was failing to reach those in need came as survivors stepped up protests this week saying food rations had not* ***made their arrival****.*	• **P-13** • **OTHER-8** (animacy 3)
47.	190	*	*...the total*	*	*

			***reached** 112,279.*		
48.	191	38	*Indonesian Welfare Minister...**has predicted** the body count would...*	*Indonesian Welfare Minister...**has made the prediction that** the body count would...*	• **R-25** • **GOOD-19**
49.	193	*	*The wreckage of an Afghan airliner that **went missing** with 104 people on board was found yesterday...*	*	*
50.	196	*	*... they **were calling off** their hunt for the day because of darkness and bad weather.*	*	*
51.	199	*	*The security source said the Kam Air Boeing 737 **was found** to the northeast of the capital.*	*	*
52.	202	*	*...it **went missing** after encountering heavy snow near the Kabul airport.*	*	*
53.	204	39	*Kam Air financial controller Zimarai Kamgar said the crew **contacted** Peshawar airport...*	*?Kam Air financial controller Zimarai Kamgar said the crew **made contact** with Peshawar airport...*	• **R-26** • **OTHER-9** (idiom 1)
54.	206	*	*But Pakistani officials said the flight never **reached** their airspace.*	*	*
55.	208	40	*Transport Minister...said the pilot last **contacted** the Kabul control about 3 p.m. Thursday, to ask for a weather update.*	*?Transport Minister...said the pilot last **made contact with** the Kabul control about 3 p.m. Thursday, to ask for a weather update.*	• **R-27** • **OTHER-10** (idiom 2)
56.	209	41	*The U.S. Bagram air base north of Kabul,..., **cleared** the plane for landing...*	*The U.S. Bagram air base north of Kabul,..., **gave the plane clearance/a clear** for landing...*	• **R-28** • **GOOD-20**
57.	210	42	*...but moments later it **disappeared** from*	*?...but moments later it **made a disappearance** from radar screens.*	• **P-14** • **OTHER-**

			radar screens.		**11** (animacy 4)
58.	217	*	*...51 people **died** when an Antonov transport....*	*	*
59.	218	*	*...an Antonov transport **crashed** in mountains near the southwestern Pakistani city of Quetta...*	*	*
60.	219	*	*...45 people **were killed** when...*	*	*
61.	220	*	*...another Ariana plane...**slammed into** a mountain near Kabul.*	*	*

Activities

General Count	Reference Number in Corpus	Para-phrase Count	Corpus Sentence	Paraphrase	Acceptability Judgement[80] & Nominal Type[81]
1.	2	1	*Modern political institutions **utilize** representational structures for decision making such that any individual in the society can...*	*Modern political institutions **make utilization of** representational structures for decision making such that any individual in the society can...*	• **OK-1** • **P-1**
2.	23	2	*This paper **considers** "traditional" representative decision-making with a newly proposed method...*	*This paper **carries out consideration of** "traditional" representative decision-making with a newly proposed method...*	• **OTHER-1** • **P-2**
3.	24	3	*This paper **contrasts** "traditional" representative decision-making with a newly proposed method...*	*This paper **carries out the contrasting of** "traditional" representative decision-making with a newly proposed method...*	• **OK-2** • **P-3**
4.	25	4	*This new method*	*This new method*	• **OK-3**

[80] Acceptable (Good, OK), and Unacceptable (Other), in the form "judgment"-count.
[81] P (Type 1), R (Type 2), in the form Type-count.

			increases *the likelihood that decision outcomes will accurately reflect the opinions of the whole population.*	***yields an increase in*** *the likelihood that decision outcomes will accurately reflect the opinions of the whole population.*	• **R-1**
5.	44	5	*...the opinions of participants* ***are treated*** *equally...*	*...the opinions of participants* ***are given equal treatment*** *...*	• **OK-4** • **P-4**
6.	64	*	*Decision power* ***travels*** *along paths of trust, automatically delegating to the active participants in a natural way.*	*	*
7.	70	*	*...[active nodes] only* ***collect*** *trust...*	*	*
8.	72	*	*This* ***continues*** *until all trust has been aggregated to the set of active nodes.*	*	*
9.	81	6	*If we instead* ***use*** *the social network method (3), the outcome would be 0.75.*	*?If we instead* ***make use of*** *the social network method (3), the outcome would be 0.75.*	• **OTHER-3** • **R-3**
10.	86	7	*While we also* ***studied*** *the effect of network connectivity...*	*	*
11.	88	*	*For clarity we only* ***show*** *data for network connectivity of three...*	*	*
12.	89	*	*[network connectivity of three]* ***exhibited*** *the highest performance compared to the traditional method.*	*	*
13.	92	8	*...the use of a social network* ***dampens*** *the effect of a particular choice of representatives.*	*...the use of a social network* ***carries out a dampening of/in*** *the effect of a particular choice of representatives.*	• **OTHER-4** • **P-5**
14.	95	9	*[The] social network smoothes out fluctuations so that a relatively stable model of the collective opinion* ***is maintained****...*	*[The] social network smoothes out fluctuations so that a relatively stable model of the collective opinion* ***is provided maintainance****...*	• **GOOD-1** • **P-6**
15.	101	10	*We* ***have considered*** *a traditional method of representation*	*We* ***have carried out consideration of*** *a traditional method of*	• **OK-5** • **P-7**

			decision-making...	*representation decision-making...*	
16.	116	*	*As human population* ***increases...***	*	*
17.	117	*	*... the ratio of representation* ***grows*** *more severe...*	*	*
18.	137	*	*Mr. Clinton and the older Mr. Bush* ***have been travelling*** *throughout the United States raising money...*	*	*
19.	143	*	*Monday night, a celebrity tennis match featuring Andy Roddick...* ***helped*** *to raise more than $518,000 U.S....*	*	*
20.	145	11	*The joint project* ***will be used*** *by Unicef and other relief groups "to make sure that..."*	*The joint project* ***will be made use of*** *by Unicef and other relief groups "to make sure that..."*	• **OK-6** • **R-4**
21.	147	*	*...to make sure that we* ***do*** *everything we can to keep people alive...*	*	*
22.	163	*	*Emergency aid operations in Indonesia's Aceh province* ***were winding down...***	*	*
23.	164	*	*...with the U.S. aircraft carrier that* ***led*** *aid efforts leaving the disaster zone...*	*	*
24.	171	12	*... hiring tens of thousands of tsunami victims for reconstruction efforts* ***"will speed up*** *recovery in damaged areas."*	*... hiring tens of thousands of tsunami victims for reconstruction efforts* ***"will cause the speeding up of*** *recovery in damaged areas."*	• **GOOD-2** • **P-8**
25.	175	13	*...he* ***was beaten*** *by several military police at an air base in Banda Aceh.*	*...he* ***was subjected to a beating*** *by several military police at an air base in Banda Aceh*	• **GOOD-3** • **P-9**
26.	176	14	*An officer* ***has been questioned*** *about the alleged beating.*	*An officer* ***has been subjected to questioning*** *about the alleged beating.*	• **GOOD-4** • **P-10**
27.	177	*	*The plight of Mr.*	*	*

			*Faqih...**has drawn** media attention...*		
28.	180	*	*[...friends] who **were not affected** by the tsunami, ...*	*	*
29.	182	15	*...10 other people **were being investigated** on similar charges after dozens of complaints by victims and security forces.*	*...10 other people **were being subjected to investigation** on similar charges after dozens of complaints by victims and security forces.*	• **GOOD-5** • **P-11**
30.	186	*	*Mr. Ranavirajah's admission that aid was failing to reach those in need came as survivors **stepped up** protests this week saying food rations had not arrived.*	*	*
31.	188a	*	*Norway's ambassador Hans Brattskar, meanwhile, **will hold talks** Saturday with the Tamil Tiger rebels' political chief...*	*	*
32.	188b	16	*Norway's ambassador Hans Brattskar, meanwhile, **will hold talks** Saturday with the Tamil Tiger rebels' political chief...*	*?Norway's ambassador Hans Brattskar, meanwhile, **will talk** Saturday with the Tamil Tiger rebels' political chief...*(17)	• **OTHER-5** • **R-5**
33.	192	*	*...the body count **would continue** to rise for weeks...*		
34.	215	17	*[Kam Air] **flies** leased aircraft between Kabul and Dubai...*	*?[Kam Air] **makes flights with** leased aircraft between Kabul and Dubai...*	• **OK-7** • **R-6**
35.	216	18	*[Kam Air] **operates** several domestic routes.*	*[Kam Air] **carries out the operation of** several domestic routes.*	• **OTHER-6** • **P-12**

States

General Count	Reference Number in Corpus	Para-phrase Count	Corpus Sentence	Paraphrase	Acceptability Judgement[82] & Nominal Type[83]
1.	1	*	*(In societal-scale decision-making,) a collective* ***is faced*** *with the problem of deriving a decision that is in accord with the collective's intention.*	*	*
2.	5	*	*This work* ***shows*** *promise for the future development of policy-making systems...*	*	*
3.	6	*	*Collective decision-making* ***is*** *central to the functioning of a society...*	*	*
4.	10	*	*This approximation* ***is*** *analogous to a computer scientist's concept of "lossy" data compression where some loss of information loss...*	*	*
5.	11	*	*Accordingly, we* ***can*** *call the use of representative decision-makers social compression...*	*	*
6.	12	*	*A lossless 1-to-1 representational structure* ***is*** *the case when all individuals are representatives of themselves, a direct democracy.*	*	*
7.	13	*	*...when the ratio of representation reaches an all-to-1 model, one individual* ***is*** *a gross lossy model of the group...*	*	*
8.	14	*	*Most modern democratic institutions* ***lie*** *in between these two extremes...*	*	*

[82] Acceptable (Good, OK), and Unacceptable (Other), in the form "judgment"-count.
[83] P (Type 1), R (Type 2), in the form Type-count.

9.	18	*	*Presumably, there* ***is*** *a congressional membership limit...*	*	*
10.	19	*	*...the communications overhead required to conduct traditional parliamentary process* ***has*** *a practical ceiling...*	*	*
11.	20	*	*...yet there* ***is*** *also the simple fact...*	*	*
12.	29	*	*This* ***is followed*** *by a discussion of implications...*	*	*
13.	31	*	*...this latter method* ***is*** *more likely to accurately reflect the opinions of the whole collective.*	*	*
14.	34	*	*Figuratively, one* ***could*** *imagine a node with a 0.0 opinion as an extreme conservative and an individual with a 1.0 opinion as an extreme liberal.*	*	*
15.	35	1	*Values in between these bounds* ***represent*** *the diverse opinions of the general population.*	*Values in between these bounds* ***provide a representation of*** *the diverse opinions of the general population.* *Values in between these bounds*	• **GOOD-1** • **R-1**
16.	36	2	*...the set N* ***denotes*** *the entire population...*	*...the set N* ***provides the denotation of*** *the entire population...*	• **GOOD-2** • **R-2**
17.	37	3	*...the subset A* ***denotes*** *the active participants.*	*...the subset A* ***provides the denotation of*** *the active participants.*	• **GOOD-3** • **R-3**
18.	40	*	*...the closer the number of actively participating individuals (|A|)* ***is*** *to the size of the total population (|N|)...*	*	*
19.	41	*	*...the more accurately the group* ***is able*** *to model the perspective of all its constituent members.*	*	*

20.	43	*	*Equation 1* ***is*** *a complete description of the first form of representative decision-making we are considering...*	*	*
21.	45	*	*The second form (3)* ***is*** *identical ...*	*	*
22.	47	*	*The weight(p) parameter in (3)* ***is*** *the number of non-participants being represented by participant p...*	*	*
23.	48	*	*This weight* ***may*** *be fractional ...*	*	*
24.	49	*	*...the sum of all weights always* ***equals*** *the total number of participants, N.*	*	*
25.	50	*	*Thus equation (3)* ***is*** *simply a weighted average of participants' opinions.*	*	*
26.	54	*	*This* ***is*** *an oversimplification of trust formation in the real world...*	*	*
27.	58	4	*...edge-weights in our model actually* ***denote*** *the percentage of each node's trust assigned to each adjacent node.*	*...edge-weights in our model actually* ***provide the denotation of*** *the percentage of each node's trust assigned to each adjacent node.*	• **GOOD-4** • **R-4**
28.	59	*	*The only thing that* ***remains*** *to be defined (is the method for calculating weight(p)...)*	*	*
29.	61	5	*Figure 1 below* ***depicts*** *a simple example showing trust connections among a four node collective...*	*Figure 1 below* ***provide a depiction of*** *a simple example showing trust connections among a four node collective...*	• **GOOD-5** • **R-5**
30.	63	*	*The great utility of this social network method* ***is*** *that we take advantage of trust transitivity.*	*	*
31.	65	6	*In figure 1, human A* ***trusts*** *B completely...*	*In figure 1, human A* ***holds trust in*** *B*	• **GOOD-6** • **R-6**

				completely...	
32.	67	*	*We **can** imagine that (each node is initially given one unit of trust...)*	*	*
33.	75	7	*...we **trust** different people for different reasons...*	*...we **have trust in** different people for different reasons...*	• **GOOD-7** • **R-7**
34.	76	8	*...individuals **would need** a different set of peers for each subject domain of decision making.*	*...individuals **would have the need** a different set of peers for each subject domain of decision making.*	• **GOOD-8** • **R-8**
35.	78	*	*C's weight **is** 1.5.*	*	*
36.	79	*	*...the outcome **would be** 0.7...*	*	*
37.	84	*	*Our intent **was** to measure the accuracy of group decision outcomes relative to expected outcomes...*	*	*
38.	91	*	*This result **was** especially dramatic...*	*	*
39.	99	*	*Participants **are** at minimum representatives of their own opinions...*	*	*
40.	105	*	*...this increase in error **can** be significantly dampened for nearly any number or representatives...*	*	*
41.	106	*	*This research **has** important implications for collectives...*	*	*
42.	107	*	*...the structure of the underlying social network **is** relatively stable.*	*	*
43.	109	*	*This **is** analogous to a hologram...*	*	*
44.	110	*	*...any broken-off part of the whole image **is** in fact a lower-resolution version of the whole.*	*	*
45.	111	*	*The idea of dynamic representation **has** an important role to play in the future development of societal-scale decision-making systems...*	*	*

46.	112	9	*Formally, this complexity transition* ***corresponds*** *to a shift from hierarchical control structures to participatory networks.*	*Formally, this complexity transition* ***lies in correspondence*** *with a shift from hierarchical control structures to participatory networks.*	• **GOOD-9** • **R-9**
47.	114	*	*...it* ***will be*** *necessary to replace the traditionally static...forms of representation...*	*	*
48.	115	*	*...future designers of large-scale human decision-making systems* ***will find*** *our societal networks-based method of use in meeting this emerging need.*	*	*
49.	119	*	*...no one* ***could*** *better ensure that...*	*	*
50.	120	*	*...the world* ***does not forget*** *the needs of the countries devastated by the Dec. 26 disaster.*	*	*
51.	121b	*	*Mr. Clinton said in a statement that he* ***looks forward to*** *serving as Mr. Annan's special envoy, starting in March,...*	*	*
52.	122	*	*...he* ***will have*** *more to say about the job at that time.*	*	*
53.	127	10	*...the two of us* ***hope*** *to visit the region together later this month.*	*...the two of us* ***have the hope*** *of visiting the region together later this month.* ***(have hopes)***	• **GOOD-10** • **R-10**
54.	128b	*	*...Fred Eckhard said Mr. Annan* ***wanted*** *to appoint a special envoy not only to focus on the cleanup and reconstruction...*	*	*
55.	130	*	*The Secretary-General* ***is*** *confident that president Clinton will bring energy, dynamism and focus to the task of sustaining world interest in the*	*	*

			vital recovery and reconstruction phase following the tsunami disaster.		
56.	133	11	*He **believes** that no one could possibly be better qualified for this task.*	*He **holds/has the belief** that no one could possibly be better qualified for this task.*	• **GOOD-11** • **R-11**
57.	139	12	*...they **hope** to go to the tsunami-ravaged Indian Ocean region to illustrate the need for continued financial help from Americans...*	*...they **have hopes of** going to the tsunami-ravaged Indian Ocean region to illustrate the need for continued financial help from Americans...*	• **GOOD-12** • **R-12**
58.	142	13	*...he **expected** Americans to eventually contribute billions.*	*...he **had/held the expectation that** Americans to eventually would contribute billions.*	• **GOOD-13** • **R-13**
59.	151	14	*This tsunami may **illustrate** the fragility of human life...*	*This tsunami may **provide the illustration of** the fragility of human life...*	• **GOOD-14** • **R-14**
60.	152	15	*...the response to it **represents** the strength of the human spirit...*	*...the response to it **provides a representation** of the strength of the human spirit...*	• **GOOD-15** • **R-15**
61.	159	*	*The official death toll from the tsunami **is** at least 159,976, ...*	*	*
62.	168	*	*Most of the missing **are feared** dead but can't be legally declared such for a year.*	*	*
63.	173	*	*Farid Faqih,..., **had** a bruised face...*	*	*
64.	200	16	*We **don't know** if there are any survivors.*	*We **don't hold any knowledge as to whether** there are any survivors.*	• **GOOD-16** • **R-16**
65.	211	*	*At least 14 of the 96 passengers **were** foreigners,...*	*	*
66.	214	*	*Other sources said they **included** three U.S. women working for a Massachussetts-based company,...*	*	*

Accomplishments

General Count	Reference Number in Corpus	Para-phrase Count	Corpus Sentence	Paraphrase	Acceptability Judgement[84] & Nominal Type[85]
1.	3	1	*An agent-based simulation **demonstrates** that in traditional representation structures...*	*An agent-based simulation **carries out the demonstration** that in traditional representation structures... (also **gives a demonstration**)*	• **GOOD-1** • **P-1**
2.	4	2	*In the direction of a remedy, this paper **describes** a novel societal network-based method for societal-scale decision-making ...*	*In the direction of a remedy, this paper **gives a description of** a novel societal network-based method for societal-scale decision-making ...*	• **GOOD-2** • **R-1**
3.	26	3	*First we **describe** the proposed method...*	*First we **carry out the description of** the proposed method...*	• **GOOD-3** • **P-2**
4.	28	4	*Next we **present** the results of an agent-based simulation of both the traditional and proposed methods.*	*Next we **carry out the presentation of** the results of an agent-based simulation of both the traditional and proposed methods.*	• **GOOD-4** • **P-3**
5.	30	5	*In this section we **describe** a simple computer model of collective decision-making in order to compare two alternative forms of representation...*	*In this section we **carry out the description of** a simple computer model of collective decision-making in order to compare two alternative forms of representation...*	• **GOOD-5** • **P-4**
6.	42	6	*The decision error of the group **is determined** by the absolute value of the difference between the calculated group decision (1) and the expected*	*The decision error of the group **is given determining** by the absolute value of the difference between the calculated group decision (1) and the expected decision (2).*	• **GOOD-6** • **P-5**

[84] Acceptable (Good, OK), and Unacceptable (Other), in the form "judgment"-count.
[85] P (Type 1), R (Type 2), in the form Type-count.

			decision (2).		
7.	56	*	*However this equation* ***serves*** *the purposes of our simulation...*	*	*
8.	60	7	*...****we'll describe*** *the weight calculation method in the context of a realistic social network...*	*...****we'll give the description of*** *the weight calculation method in the context of a realistic social network...*	• **GOOD-7** • **R-2**
9.	71	8	*...[active nodes] do not* ***redistribute****.*	*...[active nodes] do not* ***carry out / make*** *(any)* ***redistribution****.*	• **OK-1** • **P-6**
10.	74	9	*Formal algorithms for this aggregation process* ***are presented*** *by [Steinbock 2004].*	*Formal algorithms for this aggregation process* ***are given presentation*** *by [Steinbock 2004].*	• **OK-2** • **P-7**
11.	82	10	*Now that a preliminary understanding of the social network method* ***has been presented****...*	*?Now that a preliminary understanding of the social network method* ***has been given presentation****...*	• **OK-3** • **P-8**
12.	83	11	*...we* ***summarize*** *the results of our simulation runs on networks of one hundred with constant connectivity.*	*...we give a* ***summary/summarization*** *of the results of our simulation runs on networks of one hundred with constant connectivity.*	• **GOOD-8** • **R-3**
13.	85	*	*The results in figure 2 clearly* ***show*** *the advantage of our method for varying ratios of representation.*	*	*
14.	94	12	*...the social network* ***smoothes out*** *fluctuations...*	*...the social network* ***carries out a smoothing out*** *of fluctuations...*	• **GOOD-9** • **P-9**
15.	100	*	*[Participants represent the entire collective insomuch that...] decisions* ***determine*** *collective actions.*	*	*
16.	102	13	*...decision outcomes* ***derive*** *solely from the opinions of the participating*	*?...decision outcomes* ***permit/allow of derivation*** *solely from the opinions of the participating individuals.*	• **OTHER-1** • **P-10**

			individuals.		
17.	113	*	*...it **plays** out in the context of public policy-making.*	*	*
18.	121a	14	*Mr. Clinton **said in a statement** that he looks forward to serving as Mr. Annan's special envoy, starting in March,...*	**Mr. Clinton **made the statement in a statement** that he looks forward to serving as Mr. Annan's special envoy, starting in March,...*(14)	• **OTHER-2** • **R-4**
19.	121c	15	*Mr. Clinton **said in a statement** that he looks forward to serving as Mr. Annan's special envoy, starting in March,...*	*?Mr. Clinton **stated** that he looks forward to serving as Mr. Annan's special envoy, starting in March,...* (15)	• **OTHER-3** • **R-5**
20.	126	*	*Mr. Clinton **said** he will continue to focus on his work with the older Mr. Bush...*	*	*
21.	128a	*	*...Fred Eckhard **said** Mr. Annan wanted to appoint a special envoy not only to focus on the cleanup and reconstruction...*	*	*
22.	131	*	*The Secretary-General is confident that president Clinton **will bring** energy, dynamism and focus to the task of sustaining world interest in the vital recovery and reconstruction phase following the tsunami disaster.*	*	*
23.	132	*	*"..." **said the announcement** from Mr. Eckhard's office.*	*	*
24.	134	16	*Mr. Annan and Mr. Clinton **have decided** that a*	*Mr. Annan and Mr. Clinton **have made/(?taken) the***	• **GOOD-10** • **R-6**

			formal announcement and joint appearance will take place...	***decision** that a formal announcement and joint appearance will take place...*	
25.	*	*	*...Mr. Bush **said** last week that...*	*	*
26.	*	*	*...Mr. Clinton **said** that more than one-third of a billion dollars had already been donated to U.S. chairities...*	*	*
27.	*	*	*"..." Mr. Clinton **said** at January's launch.*	*	*
28.	*	*	*"..." he **said** last month.*	*	*
29.	161	17	*The UN said Friday that it **will hire** up to 30,000 tsunami survivors in the country to accelerate reconstruction...*	*The UN said Friday that it **will carry out the hiring of** up to 30,000 tsunami survivors in the country to accelerate reconstruction...*	• **OTHER-4** • **P-11**
30.	167a	18	*The number of missing remains 127,749, **said** the government's National Disaster Relief Coodinating Board **in a statement**.*	**The number of missing remains 127,749, **made the statement** the government's National Disaster Relief Coodinating Board **in a statement**.*(18)	• **OTHER-5** • **R-7**
31.	167b	19	*The number of missing remains 127,749, **said** the government's National Disaster Relief Coodinating Board **in a statement**.*	*?The number of missing remains 127,749, **stated** the government's National Disaster Relief Coodinating Board.* (19)	• **OTHER-6** • **R-8**
32.	169	20	*Most of the missing are feared dead but can't **be** legally **declared** such for a year.*	*Most of the missing are feared dead but can't legally **be given such a declaration** for a year.*	• **OK-4** • **R-9**
33.	170	*	*UN Development Program spokeswoman Mieke Kooistra **said** hiring tens of thousands of*	*	*

			tsunami victims for reconstruction efforts "will..."		
34.	172	*	*Also Friday, an Indonesian anti-corruption activist detained on allegations of stealing aid* ***was taken*** *to hospital...*	*	*
35.	174	*	*[Farid Faqih]* ***said*** *he was beaten...*	*	*
36.	185	*	*Mr. Ranavirajah's admission that aid* ***was failing*** *to reach those in need came as survivors stepped up protests this week saying food rations had not arrived.*	*	*
37.	189	21	*Indonesia ...****buried*** *them...*	*Indonesia...**gave them a burial**... Indonesia...**carried out their burial**... Indonesia...**carried out their burying**...	• **GOOD-11** • **P-12**
38.	194	*	*...a day after it* ***ran*** *into a snowstorm...*	*	*
39.	197	*	*[NATO troops]* ***said*** *they were calling off their hunt for the day because of darkness and bad weather.*	*	*
40.	198	*	*The security source* ***said*** *the Kam Air Boeing 737 was found to the northease of the capital.*	*	*
41.	201	22	*The aircraft* ***was flying*** *from the western city of Heart to Kabul on Thursday when...*	*The aircraft* ***was making a flight*** *from the western city of Heart to Kabul on Thursday when...*	• **GOOD-12** • **R-10**
42.	203	*	*Kam Air financial controller Zimarai Kamgar* ***said*** *the crew*	*	*

			contacted Peshawar airport....		
43.	205	*	*But Pakistani officials* ***said*** *the flight never reached their airspace.*	*	*
44.	207	*	*Transport Minister...* ***said*** *the pilot last contacted the Kabul control about 3 p.m. Thursday...*	*	*
45.	212	*	*At least 14 of the 96 passengers were foreigners, the security source* ***said.***	*	*
46.	213	*	*Other sources* ***said*** *they included three U.S. women working for a Massachussetts-based company,...*	*	*

Semelfactives

General Count	Reference Number in Corpus	Para-phrase Count	Corpus Sentence	Paraphrase	Acceptability Judgement [86]
1.	69	1	*The process* ***iterates*** *with each node redistributing trust received on the previous iteration...*	*The process* ***makes an (/one) iteration*** *with each node redistributing trust received on the previous iteration...*	• **GOOD-1**
2.	124	2	*...countries devastated by the earthquake off Indonesia that* ***triggered*** *tsunamis across the Indian Ocean to Africa.*	*...countries devastated by the earthquake off Indonesia that* ***was the trigger of*** *tsunamis across the Indian Ocean to Africa.*	• **GOOD-2**
3.	149	3	*The former president* ***has praised*** *the outpouring of*	*The former president* ***has made/given praise of*** *the outpouring of*	• **GOOD-3**

[86] Acceptable (Good, OK), and Unacceptable (Other), in the form "judgment"-count.

			support for the tsunami victims…	*support for the tsunami victims… (also **held (high) praise of**)*	
4.	178	4	*…he recently **accused** government officials in Aceh of trying to win more aid by inflating the number of refugees in camps.*	*…he recently **made the accusation that** government officials in Aceh were trying to win more aid by inflating the number of refugees in camps.* *…he recently **made accusations against (or brought under accusation)** government officials in Aceh for trying to win more aid by inflating the number of refugees in camps.*	• **GOOD-4**
5.	179	5	*In Sri Lanka, two village officials **were accused** of channelling aid to friends…*	*In Sri Lanka, two village officials **were brought under accusation for** channelling aid to friends…* *In Sri Lanka, two village officials **were made the accusation of** channelling aid to friends…*	• **GOOD-5**
6.	195	6	*But NATO troops searching for the plane **denied** it had been found …*	*? But NATO troops searching for the plane **issued a denial that** it had been found …*	• **OTHER -1**

Appendix 2: Other Corpus Sentences and Their Sources

Refer-ence Number	Corpus Sentence	Source
O1	Around 110 people made utilisation of the eight-day rotary camp organised to distribute free artificial limbs.	(2005) Rotary distributes free limbs to beneficiairies. *Deccan Herrald.* www.deccanherald.com/deccanherald/mar022005/d11.asp
O2	I thus came up with a method, which *makes utilization of* Session and Application variables, and no physical binding to any database server	www.4guysfromrolla.com/webtech/041000-1.shtml
O3	The system *makes utilization of* the WDT timer to store a user defined TPO value, the TPO value is a TOD stamp representing a future state of when the system is to be powered on	www.priorartdatabase.com/IPCOM/000010321
O4	Sony Ericsson Mobile Communications AB will counter Motorola's introduction yesterday of its first iTunes-compatible cell phone when it unveils a mobile phone-cum-digital music player early next month, company President Miles Flint *announced* at the 3GSM World Congress in Cannes on Monday.	playlistmag.com/news/2005/02/15/**sonyericsson**/index.php

O5	"Our patience has been rewarded!" *announced* Mr. Wright.	www.the**wright**choice.com/whatsnew4intro.htm
O6	Nazakat Babayeva *carries out consideration* of some problems of Azeri's family life in the early middle ages.	www.phillaw.aznet.org/genderen/edition4.htm
O7	The Working Group's objective was to *carry out consideration* of all aspects of transnational corporations affecting human rights, Mr. Guisse said, with the hope that such research efforts would lead to preparation of an instrument that would contain guidelines or binding standards for these corporations.	wwwserver.law.wits.ac.za/**human**rts/demo /1994min.html
O8	Figure 2 *is the illustration of* that model	http://tc.unl.edu/dean/scholarPractitioner/evolutSP.html
O9	If a $\forall x P(x)$ is false although $P(t)$ is true for every term t, then the universe of the model is to contain such an i that $i \notin \| P \|$ (where $\| P \|$ *is the denotation of* P, a subset of the universe)	http://www.hf.uio.no/filosofi/njpl/vol2no1/ models/node5.html
O10	As a final step, recognizing that the integral over y^2 *is the definition of* the beam's area moment of inertia I,	www.efunda.com/formulae/solid_mechanics /beams/theory.cfm

	$I = \int\int y^2 \cdot dy \cdot dz$ allows us to arrive at the Euler-Bernoulli beam equation, $\frac{d^2}{dx^2}\left[EI\frac{d^2w}{dx^2}\right] = p$	
O11	Littlefish Open Source health record Software *embodies* the dream of knowledge-sharing and community-building	http://www.hoise.com/vmw/99/articles/vmw/ LV-VM-12-99-12.html.
O12	According to one tradition, recorded from a farm labourer in the Gentleman's Magazine, the figure *is the representation* of a Danish giant who had led an invasion of England from the coast	http://www.mysteriousbritain.co.uk/majorsites/cerne_abbass.html
O13	The image of the sphinx *is a depiction* of royal power	http://interoz.com/egypt/sphinx.htm
O14	The religious procession *is a re-enactment of* the finding of the Holy Cross by Reyna Helena	http://www.philippines.hvu.nl/culture2.htm.

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