

Appendix A

Annotation Guidelines for ETPC

A.1 Presentation

This document sets out the guidelines for the paraphrase typology annotation task, using the Extended Paraphrase Typology. The task consists of annotating candidate paraphrase pairs (including positive and negative examples of paraphrasing) with a textual paraphrase label, the paraphrase types they contain, and negation. These guidelines have been used to annotate the Microsoft Research Paraphrase Corpus (MRPC), thus giving raise to the Extended Typology Paraphrase Corpus (ETPC). For the purpose of the annotation, we have developed a web based annotation tool, the WARP-Text interface.

This document is divided in five blocks: general considerations about the task and theoretical definitions (Section A.2); tagset definition (section A.3); guidelines for annotating non-paraphrases (section A.4); annotating negation (section A.5).

Marks and symbols used in this document:

- Fragments in the examples that should be annotated are underlined.
When no fragment is underlined, it means that it is the whole example that should be tagged.
- The so-called “key elements” are in **bold**.

A.1.1 Credits

This document has been adapted and extended from the paraphrase typology annotation guidelines of Vila and Martí (2012).

A.2 The task

Paraphrasing stands for sameness of meaning between different wordings. For example, the pair of sentences in (a) are different in form but have the same meaning. Our **paraphrase typology (ETPC)** classifies paraphrases according to the linguistic nature of this difference in wording.

- a) John said “I like candies”/John said that he liked sweets.
- b) John said “I like candies”/John said that he liked onion.

The task described in these guidelines consists of annotating a Paraphrase Identification corpus (MRPC) with the Extended Paraphrase Typology (EPT). A Paraphrase Identification corpus contains textual paraphrase pairs (ex.: (a)), as well as textual non-paraphrase pairs (ex.: (b)). Our annotation task consists of two sub-tasks:

Annotating atomic paraphrases within textual paraphrase pairs (a) and textual non-paraphrase pairs (b). The textual pairs are generally complex in the sense that they contain multiple atomic paraphrases. We call these atomic paraphrases paraphrase phenomena and they are what should be annotated with the typology. The paraphrase pair in (a) contains two paraphrase phenomena: the direct/indirect style alternation and a synonymy substitution.

Annotating atomic non-paraphrases within textual non-paraphrase pairs (b). The non-paraphrase pair in (b) contains one atomic non-paraphrase: the substitution of “candies” with “onion”.

In the annotation process, three main decisions should be made:

- 1) determine whether a candidate pair is a textual paraphrase (Section A.2.1)
- 2) If **non-paraphrase**, determine the key differences between the two texts:
 - choose the tag that best describes the phenomenon behind each difference (Section A.2.2)
 - determine the scope of every atomic non-paraphrase (Section A.2.3)
- 3) Determine the similarities between the two texts:
 - choose the tag that best describes the phenomenon behind each similarity (Section A.2.2)
 - determine the scope of every atomic paraphrase (Section A.2.3)

A.2.1 Is This a Paraphrase Pair

The first step in the annotation process is determining whether a candidate paraphrase pair is actually a paraphrase. We consider paraphrases those pairs having

the same or an equivalent propositional content. We consider non-paraphrases those pairs that have substantial difference in the propositional content. For example, a) will be annotated as “paraphrases”, while b) will be annotated as “non-paraphrases”.

- a) Amrozi accused his brother, whom he called "the witness", of deliberately distorting his evidence.

Referring to him as only "the witness", Amrozi accused his brother of deliberately distorting his evidence.

- b) Yucaipa owned Dominick's before selling the chain to Safeway in 1998 for \$2.5 billion.

Yucaipa bought Dominick's in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.

Since the Extended Paraphrase Typology (ETP) can annotate atomic paraphrases (similarities) as well as atomic non-paraphrases (dissimilarities), both textual paraphrases and textual non-paraphrases will be subsequently annotated with the paraphrase typology. The subsequent annotation with paraphrase types will allow for distinguishing between paraphrase and non-paraphrase fragments within these sentences.

A.2.2 The Tagset

Our tagset is based on the Extended Paraphrase Typology shown in Table A.1. It is organized in seven meta categories: “Morphology”, “Lexicon”, “Lexico-syntax”, “Syntax”, “Discourse”, “Other”, and “Extremes”. Sense Preserving (Sens Pres.) shows whether a certain type can give raise to textual paraphrases (+), to textual non-paraphrases (-), or to both (+ / -). The typology contains 25 atomic paraphrase types (+) and 13 atomic non-paraphrase types (-).

The subclasses (morphology, lexicon, syntax and discourse based changes) follow the classical organisation in formal linguistic levels from morphology to discourse. Our paraphrase types are grouped in classes according to the nature of the underlying linguistic mechanism: (i) those types where the paraphrase arises at the morpho-lexicon level, (ii) those that are the result of a different structural organization and (iii) those types arising at the semantics level. Although the class stands for the trigger change, paraphrase phenomena in each class can entail changes in other parts of the sentence. For instance, a morpho-lexicon based change (derivational) like the one in (a), where the verb *failed* is exchanged for its nominal form *failure*, has obvious syntactic implications; however, the paraphrase is triggered by the morphological change. A structure based change (diathesis)

like the one in (b) entails an inflectional change in *hear/was heard* among others. Finally, paraphrases in semantics are based on a different distribution of semantic content across the lexical units with, on many occasions, a complete change in the form (c).

Table A.1 Extended Paraphrase Typology

ID	Type	Sense Pres.
Morphology-based changes		
1	Inflectional changes	+ / -
2	Modal verb changes	+
3	Derivational changes	+
Lexicon-based changes		
4	Spelling changes	+
5	Same polarity substitution (habitual)	+
6	Same polarity substitution (contextual)	+ / -
7	Same polarity sub. (named entity)	+ / -
8	Change of format	+
Lexico-syntactic based changes		
9	Opposite polarity sub. (habitual)	+ / -
10	Opposite polarity sub. (contextual)	+ / -
11	Synthetic/analytic substitution	+
12	Converse substitution	+ / -
Syntax-based changes		
13	Diathesis alternation	+ / -
14	Negation switching	+ / -
15	Ellipsis	+
16	Coordination changes	+
17	Subordination and nesting changes	+
Discourse-based changes		
18	Punctuation changes	+
19	Direct/indirect style alternations	+ / -
20	Sentence modality changes	+
21	Syntax/discourse structure changes	+
Other changes		
22	Addition/Deletion	+ / -
23	Change of order	+
24	Semantic (General Inferences)	+ / -
Extremes		
25	Identity	+
26	Non-Paraphrase	-
27	Entailment	-

- a) how the headmaster failed / the failure of the headmaster
- b) We were able to hear the report of a gun on shore intermittently / the report of a gun on shore was still heard at intervals
- c) I'm guessing we won't be done for some time / I've got a hunch that we 're not through with that game yet

Miscellaneous changes comprise types not directly related to one single class. Finally, in paraphrase extremes, two special cases of paraphrase phenomena should be considered: they consist of the extremes of the paraphrase continuum, which goes from the highest level of paraphrasability (identity) to the lowest limits of the paraphrase phenomenon (entailment). Non-paraphrase fragments within paraphrase pairs are also part of the class paraphrase extremes.

As some of the names of our types explicitly reflect (e.g. ADDITION / DELETION), they are **bidirectional**: in a paraphrase pair, they can be applied from the first member of the pair to the second and vice versa.

ETP contains both "sense preserving" atomic phenomena (atomic paraphrases) and "non sense preserving" atomic phenomena (atomic non-paraphrases). While some phenomena are considered to (almost) always preserve the meaning (ex.: abbreviation, habitual same polarity substitution), other phenomena are not innately preserving the meaning and can lead both to paraphrasing and to non-paraphrasing at the textual level (ex.: In (d) and (e) the involved phenomena is the same - "inflectional change", however in (d) the two texts are paraphrases, while in (e) they are not). The "sense preserving" feature is required for the annotation of the "non-paraphrases".

- d It was with difficulty that the course of streets could be followed.
You couldn't even follow the path of the street.
- e You can't travel from Barcelona to Mallorca with the boat.
underlineBoats can't travel from Barcelona to Mallorca.

A.2.3 The Scope

The scope refers to the selection of the tokens to be annotated within each tag. In what follows, we first define the type of units we are willing to annotate (Section A.2.3.1), the criteria followed in the scope selection (Section A.2.3.2) and when the punctuation marks should be included (Section A.2.3.3).

A.2.3.1 Kind of Units to Be Annotated

We annotate **linguistic units**, not strings that do not correspond to a full linguistic unit. These linguistic units can go from the word to the (multiple-)sentence level.

In the paraphrase pair in (a), although a change takes place between the snippets *here by* and *it is there in*, two paraphrase mappings have to be established between *here* and *there* (1), and *by virtue of* and *in virtue of* (2), two different pairs of linguistic units.

- a) Here ₁ by virtue of ₂ humanity's vestures.
It is there ₁ in virtue of ₂ the vesture of humanity in which it is clothed.

However, selecting full linguistic units is not always possible or adequate from the paraphrase annotation point of view. In the following, we set out some exceptions to the above rule:

1. Cases in which **only one member of the paraphrase pair corresponds to a linguistic unit**. In (b), a SEMANTICS BASED CHANGE occurs between the underlined fragments. In the first sentence, it consists in a full linguistic unit, namely a causal clause; in the second sentence, the semantic content in the first appears divided into a nominal phrase and part of a verbal phrase, i.e., the verb *has impressed*. This nominal phrase plus the verb, although they do not constitute a full linguistic unit, are the scope of the phenomenon in the second sentence

- b) There is a pattern of regularity and order in the entire cosmos, due to some hints that science provides us.
A presiding mind has impressed the stamp of order and regularity upon the whole cosmos.

2. Cases in which **none of the members of the paraphrase pair correspond to a linguistic unit**. The prototypical example of this situation are contractions, within the SPELLING tag. In (c), *I* constitutes a nominal phrase and *will* is part of a verbal phrase. As the contraction is produced between these two pieces, they and only they constitute the scope of the phenomenon.

- c) I will go to the cinema.
I'll go to the cinema.

3. Cases of **identical** (see Section A.2.3.2)

A.2.3.2 Scope Annotation Criteria

The way the scope should be annotated depends on the class of the tag. Three criteria should be followed:

1. Morpho-lexicon based changes, semantics based changes and miscellaneous changes: only the linguistic units affected by the trigger change are tagged.

- a) I dislike rash motorists .
I dislike rash drivers .
- b) He rarely makes us smile .
He has little to do with making us smile .

2. Structure based changes: the whole linguistic unit suffering the syntactic or discourse reorganization is tagged (light green rectangle in Figure 2). If the reorganization takes place within a phrase, the phrase is tagged. If the reorganization takes place within a clause, the clause is tagged. If the reorganization takes place within a sentence, the sentence is tagged. If the reorganization takes place between different phrases/clauses/sentences (mainly coordination and subordination phenomena), all and only the phrases/clauses/sentences affected are tagged. In the case of clause changes, if the reorganizations takes place within the subordinate clause, only this one is annotated (not the main clause) and vice versa.

Moreover, all structure based changes (except from diathesis alternations) have a **key element** that gives rise to the change and/or distinguishes it from others. This key element is also annotated. First, the whole linguistic unit (including the key element) is tagged, and then the key element is annotated independently.

In (d), an active/passive alternation takes place (DIATHESIS tag). As the change takes place within the subordinate clause, only this clause is tagged. In (e), a change in the subordination form takes place (SUBORDINATION & NESTING tag). As the change affects the way the two clauses (the main and the subordinate) are connected, the whole sentence is tagged. The connective mechanisms (the conjunction and the gerund clause) are annotated as key elements.

- d) When she sings that song, everything seems possible.
When that song is sang, everything seems possible.
- e) **When** we hear that song, everything seems possible.
Hearing that song, everything seems possible.

3. Entailment and non-paraphrase tags: the affected linguistic unit is tagged. The example in (f) is a case of ENTAILMENT; the example in (g) is a NON-PARAPHRASE.

- f) Google was in talks to buy YouTube.
Google bought YouTube.
- g) Mary and Wendy went to the cinema .
Mary and Wendy like each other .

4. Identical tag: Once all other phenomena are annotated, snippets which are identical in both sentences may remain. We should annotate as IDENTICAL these snippet (**not linguistic unit**) residues (h). In this case, we do not follow the linguistic unit criteria (Section A.2.3.1).

Only one (discontinuous) identical tag will be used in each pair of sentences.

Punctuation marks will also be annotated as IDENTICAL if they effectively are.

- h) The two argued that only a new board would have had the credibility to restore El Paso to health.
The two believed that only a new board would have had the credibility to restore El Paso to health.

Finally, it should be noted that tags overlap on many occasions. In (i), a SAMEPOLARITY tag overlaps an ORDER one.

- i) shaking his head wisely .
sagely shaking his head.

A.2.3.3 Should Punctuation Marks Be Included?

When a whole phrase/cause/sentence is annotated, **the closing (and opening) punctuation mark (if any) is(are) included**. Some examples are (a) and (b), which are cases of DIATHESIS and ADDITION/ELETION, respectively. In contrast, in (c) and (d), the commas are not included as they are not the opening and closing punctuation marks of the paraphrase phenomenon tagged (SAME-POLARITY), but of a bigger unit.

- a) This song (John sang it last year in the festival) will be a great success.
This song (it was sung by John last year in the festival) will be a great success.
- b) His judgment have kept equal pace in that conclusion.
His judgment and interest may , however , have kept equal pace in that conclusion.

- c) Before leaving and before saying goodbye , I looked around.
 Before leaving and before the bye bye moment , I looked around.
- d) My sisters, lovely girls, live in Melbourne.
 My sisters, nice girls, live in Melbourne.

A.3 Tagset Definition

In the following, the annotation specifics are presented. For each tag, we provide (1) the definition and (2) examples both for “positive sense preserving” and “negative sense preserving” instances, where applicable.

A.3.1 Morphology based changes

Morphology based changes stand for those paraphrases that take place at the morphology level of language. Some changes in this class arise at the morphology level, but entail significant structural implications in the sentence. Only the linguistic unit affected by the trigger morphology change is annotated.

A.3.1.1 Inflectional changes

Definition: Inflectional changes consist in changing inflectional affixes of words. In the case of verbs, this type includes all changes within the verbal paradigm. **Negative sense preserving** inflectional changes lead to significant changes in the meaning of the whole text, thus giving raise to non-paraphrases.

- Positive sense preserving:
 It was with difficulty that the course of **streets** could be followed.
 You couldn't even follow the path of the **street**.
- Negative sense preserving:
 You can't travel from Barcelona to Mallorca with the **boat**.
 Boats can't travel from Barcelona to Mallorca.

A.3.1.2 Modal verb changes

Definition: The MODAL VERB tag stands for changes of modality using modal verbs.

- Positive sense preserving:
 I was still lost in conjectures who they **might** be.
 I was pondering who they **could** be.

A.3.1.3 Derivational changes

Definition: The DERIVATIONAL tag stands for changes of category by adding derivational affixes to words. These changes comprise a syntactic reorganization in the sentence where they occur.

- Positive sense preserving:

I have heard many accounts of him all **differing** from each other.

I have heard many **different** things about him.

Although drivers and driving are linked by a derivational process, in the following example this type is classified as SAME-POLARITY, and not as a DERIVATIONAL, because there is not an actual change of category, both are acting as nouns.

- I dislike rash drivers.

I dislike rash driving.

A.3.2 Lexicon based changes

Lexicon based change tags stand for those paraphrases that arise at the lexical level.

Always the **smallest** possible lexical unit has to be annotated. In (a), we should not consider one single paraphrase phenomenon because it can be divided into two lexical units pairs: often-debated/much-disputed (1) and issue/question (2). These SAME-POLARITY substitutions are independent paraphrase phenomena, as we could substitute often-debated by much-disputed, leaving issue unchanged (much-disputed issue). Thus, two different SAME-POLARITY tags should be used. In contrast, in (b), lies and is revealed should not be tagged on their own as SAME-POLARITY substitutions, as they are semantically embedded in the wider lexical units lies its appeal and its appeal is revealed, respectively. The tag used in this case is, again, SAME-POLARITY.

- a) often-debated₁ issue₂
much-disputed₁ question₂

- b) Here by virtue of humanity's vestures, lies its appeal .
Here by virtue of humanity's vestures, its appeal is revealed .

Auxiliaries and infinitive marks are not tagged within the lexical unit in question. Only the verb to be, when it is part of a passive voice, should be included in the scope (c).

- c) The viewpoint of these lands had been altered .
The whole aspect of the land had changed.

A.3.2.1 Spelling changes

Definition: This type comprises spelling changes and changes in the lexical form in general. Spelling is always sense preserving. Some examples:

1. Spelling

- a) color / colour

2. Acronyms

- b) North Atlantic Treaty Organization / NATO

3. Abbreviations

- c) Mister / Mr.

4. Contractions

- d) you have / you've

5. Hyphenation

- e) flow-accretive / flow accretive

A.3.2.2 Same Polarity Substitution

Definition: The SAME-POLARITY tag is used when a lexical unit is changed for another one with approximately the same meaning. Both lexical (a) and functional (b) units are considered within this type. Sameness of category is not a requisite to belong to this type (c).

- a) The pilot took off despite the stormy weather .
The plane took off despite the stormy weather .
- b) Despite the stormy weather
In spite of the stormy weather
- c) He rarely makes us smile .
He has little to do with making us smile.

When prepositions are part of a larger lexical unit, changes or deletions of these prepositions are tagged as SAME-POLARITY and annotated together with the lexical unit where they are embedded (d).

- d) do away / do away with

SAME-POLARITY may be used to tag several linguistic mechanisms, the following among them:

1. Synonymy

- e) I like your house .
I like your place .

2. General/specific

- f) I dislike rash motorists .
I dislike rash drivers .

3. Exact/approximate

- g) They were 9 .
They were around 10 .

4. Metaphor

- h) I was staring at her shinning teeth .
I was staring at her shinning pearls .

5. Metonymy

- i) I read a book written by Shakespeare .
I read a Shakespeare

6. Expansion/compression: expressing the same content with multiple pieces and/or in a more detailed way.

- j) Ended up causing a calm aura
Caused a rather sober and subdued air

7. Word/definition

- k) Heart attacks have experienced an increase in the last decades.
Sudden coronary thromboses have experiences an increase in the last decades.

8. Translation

- l) Jean-Francois Revel, in History of the Western Philosophy
Jean-Francois Revel, in Histoire de la philosophie occidentale

9. Idiomatic expressions

- m) It is raining cats and dogs .
 It is raining a lot .

10. Part/whole

- n) Yesterday I cut my finger .
 Yesterday I cut my hand

In the EPT, we distinguish between **three different kinds same-polarity substitution**: habitual, contextual, and named entity. The kind of same-polarity substitution depends on the nature of the relation between the substituted text.

Same Polarity Substitution (habitual)

The SAME-POLARITY (HABITUAL) tag is used when a lexical unit is changed for another one with approximately the same **dictionary** meaning. The substituted units have a similar meaning outside of the particular context as well as within the context. Same-polarity (habitual) is always **sense preserving**:

- Positive sense preserving:
 A federal magistrate in Fort Lauderdale ordered him held without bail.
 Zuccarini was ordered held without bail Wednesday by a federal judge in Fort Lauderdale, Fla.

Same Polarity Substitution (contextual)

The SAME-POLARITY (CONTEXT) tag is used when a lexical unit is changed for another one with approximately the same meaning **within the given context**. The substituted units have different out-of-context meaning. The negative sense preserving SAME-POLARITY is always contextual (unless it requires named entity reasoning). In the case of **negative sense preserving** same polarity substitution, the meaning of the units is similar, but not the same - it includes key differenced and/or incompatibilities that give raise to non-paraphrasing at the level of the two texts.

- Positive sense preserving:
 Meanwhile, the global death toll approached 770 with more than 8,300 people sickened since the severe acute respiratory syndrome virus first appeared in southern China in November.
 The global death toll from SARS was at least 767, with more than 8,300 people sickened since the virus first appeared in southern China in November.

- Negative sense preserving:

The loonie, meanwhile, continued to slip in early trading Friday.

The loonie, meanwhile, was on the rise again early Thursday.

Same Polarity Substitution (Named Entity)

The SAME-POLARITY (NE) tag is used when a lexical unit is changed for another one with approximately the same meaning. Both replaced units are **named entities or properties of named entities**. Some degree of world knowledge and named entity reasoning is required to correctly determine whether the substitution is sense preserving or not. In the case of **negative sense preserving** same polarity substitution, the meaning of the units is similar, but not the same - it includes key differences and/or incompatibilities that give rise to non-paraphrasing at the level of the two texts.

- Positive sense preserving:

He told The Sun newspaper that Mr. Hussein's daughters had British schools and hospitals in mind when they decided to ask for asylum.

Saddam's daughters had British schools and hospitals in mind when they decided to ask for asylum – especially the schools, he told The Sun.

- Negative sense preserving:

Yucaipa owned Dominick's before selling the chain to Safeway in 1998 for \$2.5 billion.

Yucaipa bought Dominick's in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.

A.3.2.3 Change of Format

Definition: This tag stands for changes in the format. Format is always sense preserving. Some examples:

1. Digits/in letters

a) 12 / twelve

2. Case changes

b) Chapter 3 / CHAPTER 3

3. Format changes

c) 03/08/1984 / Aug 3 1984

A.3.3 Lexico-syntactic based changes

Lexico-syntactic based change tags stand for those paraphrases that arise at the lexical level but are also entailing significant structural implications in the sentence. Similar to lexicon changes always the **smallest** possible lexical unit has to be annotated.

A.3.3.1 Opposite polarity substitution

Definition: OPPOSITE-POLARITY stands for changes of one lexical unit for another one with opposite polarity. In order to maintain the same meaning, other changes have to occur. Two phenomena are considered within this type:

1. Double change of polarity A lexical unit is changed for its antonym or complementary. In order to maintain the same meaning, a double change of polarity has to occur within the same sentence: another antonym (a) or complementary substitution (b), or a negation (c). In the case of double change of polarity, the two changes of polarity have to be tagged as a single (and possibly discontinuous, like in b) phenomenon and using a single tag.

- a) John lost interest in the endeavor .
John developed disinterest in the endeavor .
- b) Only 20% of the students were late .
Most of the students were on time .
- c) He did not succeed in either case .
He failed in both enterprises .

2. Change of polarity and argument inversion An adjective is changed for its antonym in comparative structures. In order to maintain the same meaning, an argument inversion has to occur (d). In the case of change of polarity and argument inversion, only the antonym adjectives are tagged.

- d) The neighboring town is poorer in forest resources than our town.
Our town is richer in forest resources than the neighboring town.

In the EPT, we distinguish between **two different kinds opposite-polarity substitution**: habitual and contextual. The kind of opposite-polarity substitution depends on the nature of the relation between the substituted text.

Opposite polarity substitution (habitual)

The OPP-POLARITY (HABITUAL) tag is used when a lexical unit is changed for another one with approximately the opposite **dictionary** meaning. The substituted units have an opposite meaning outside of the particular context as well as within the context. The **negative sense preserving** Opposite Polarity Substitution appears in two different situations. First, the case where the meaning of the two units is not completely opposite - it includes key differences and/or incompatibilities that give raise to non-paraphrasing at the level of the two texts. Second, the case where the meaning of the two units are the same, but the other changes (double change of polarity or argument inversion) are not found.

- Positive sense preserving:

Leicester failed in both enterprises.
He did not succeed in either case.

- Negative sense preserving:

John loved his new car.
He hated that car.

Opposite polarity substitution (contextual)

The OPP-POLARITY (CONTEXT) tag is used when a lexical unit is changed for another one with approximately the opposite meaning **within the given context**. The substituted units have different out-of-context meaning. The **negative sense preserving** Opposite Polarity Substitution appears in two different situations. First, the case where the meaning of the two units is not completely opposite - it includes key differences and/or incompatibilities that give raise to non-paraphrasing at the level of the two texts. Second, the case where the meaning of the two units are the same, but the other changes (double change of polarity or argument inversion) are not found.

- Positive sense preserving:

A big surge in consumer confidence has provided the only positive economic news in recent weeks.

Only a big surge in consumer confidence has interrupted the bleak economic news.

- Negative sense preserving:

Johnson welcomed the new proposal.
Johnson did not approve of the new proposal.

A.3.3.2 Synthetic/Analytic substitution

Definition: SYNTHETIC/ANALYTIC stands for those changes of synthetic structures to analytic structures and vice versa. It should be noted, however, that sometimes “syntheticity” or “analyticity” is a matter of degree. Consider examples (a) and (b). In (a), we would probably consider as analytic the genitive structure. In (b), in contrast, the genitive structure would probably be the synthetic one. Genitive structures are not synthetic or analytic by definition, but more or less synthetic/analytic compared to other structures. Thus, we could redefine this group as a change in the degree of syntheticity/analyticity.

- a) the Met show / the Met’s show
- b) Tina’s birthday / The birthday of Tina

SYNTHETIC/ANALYTIC is always **sense preserving** and comprises phenomena such as:

1. Compounding/decomposition A compound is decomposed through the use of a prepositional phrase (a). The alternation adjectival/prepositional phrase (b) and single word/adjective+noun alternations (c) are also considered here.

- a) The gamekeeper preferred to make wildlife television documentaries .
The gamekeeper preferred to make television documentaries about wildlife .
- b) Chemical life-cycles of the sexes
Life-cycles for chemistry for genders
- c) One of his works holding the title "Liber Cosmographicus De Natura Locorum" belongs to a category of physiography .
One of his works bearing the title of "Liber Cosmographicus De Natura Locorum" is a species of physical geography .

2. Alternations affecting genitives and possessives Alternations between genitive/prepositional phrases (d), possessive/prepositional phrases (e), genitive/nominal phrases (f), genitive/adjectival phrases (g), etc.

- d) Tina’s birthday / The birthday of Tina
- e) His reflection / The reflection of his own features
- f) the Met show / the Met’s show
- g) Russia’s Foreign Ministry / the Russian Foreign Ministry

N.B.: A distinction has to be established between this type and DERIVATIONAL. Some DERIVATIONAL cases also contain genitive alternations (h), but these alternations are part of a wider derivational change. In the cases of genitive alternations classified as SYNTHETIC/ANALYTIC, the alternation is an isolated and independent phenomenon.

- h) Mary teaches John .
 Mary is John's teacher .

N.B.: Cases of 1 (compounding/decomposition) and 2 (alternation involving genitives and possessives) in which the alternation takes place with a clause (with a verb) are not considered here but in SUBORDINATION & NESTING (i)

- i) Volcanoes **which** are now extinct / extinct volcanoes

3. Synthetic/analytic superlative

- j) He's smarter than everybody else .
 He's the smartest .

4. Light/generic element addition: Changing a synthetic form A for an analytic form BA by adding a more generic element (B is more generic than A). A has to have the same lemma/stem in both member of the pair as in (k). Moreover, although the category of the phrase A and the phrase BA may differ, the change does not have structural consequences outside A or BA. In (l), although the adverbial phrase *cheerfully* is changed to the prepositional phrase *in a cheerful way*, the rest of the sentence remains unchanged. Finally, the order of the A and B units can be BA (k) or AB (l).

- k) John boasted about his work.
 John spoke boastfully about his work.
- l) Marilyn carried on with her life cheerfully .
 Marilyn carried on with her life in a cheerful way .

N.B.: When B is the verb to be and there is a change of category of A through a derivational process, the phenomenon is tagged as DERIVATIONAL (m)

- m) Sister Mary was helpful to Darrell .
 Sister Mary helped Darrell .

5. Specifier addition: This type is parallel to the previous one, but the added element B is not more generic, but focuses on one of the components or characteristics of A (n), emphasises A (o) or determines A (p).

- n) I had to drive through fog to get there .
I had to drive through a wall of fog to get there .
- o) We are meeting at 5 . We are meeting at 5 o'clock .
- p) Translation is what they need .
The translation is what they need .

N.B.: Contrary to SAME-POLARITY or SEMANTICS BASED CHANGES, where words vary from one member of the paraphrase pair to the other, in synthetic/analytic substitutions

- although a change of category may take place, lexical word stems are the same (1 and 2) or
- a support element is added, but other lexical word stems are the same(4 and 5).

A.3.3.3 Converse substitution

Definition: A lexical unit is changed for its converse. In order to maintain the same meaning, an argument inversion has to occur. The **negative sense preserving** converse substitution occurs when the arguments are not inverted.

- Positive sense preserving:
The Geological society of London in 1855 awarded to him the Wollaston medal.
Resulted in him receiving the Wollaston medal from the Geological society in London in 1855.
- Negative sense preserving:
Last Monday, John bought the new black car from his friend Sam.
Last week, John sold his black car to Sam, his friend from high school.

A.3.4 Syntax based changes

Syntax based change tags stand for those changes that involve a syntactic reorganization in the sentence. This type basically comprises changes within a single sentence; and changes in the way sentences, clauses or phrases are connected. The phrase/clause/sentence(s) suffering the modification is(are) tagged. All syntax tags but DIATHESIS have key elements that should be annotated as well.

A.3.4.1 Diathesis alternation

Definition: DIATHESIS gathers the diathesis alternations in which verbs can participate. The whole linguistic unit suffering the syntactic reorganization is tagged. The **negative sense preserving** diathesis alternation occurs when the arguments are not properly changed or inverted.

- Positive sense preserving:

The guide drew our attention to a gloomy little dungeon.
Our attention was drawn by our guide to a little dungeon.

- Negative sense preserving:

The president gave a speech about his plan to change the Constitution.
The president was given a speech about his plan to change the Constitution.

A.3.4.2 Negation switching

Definition: Changing the position of the negation within a sentence. The whole linguistic unit suffering the modification is tagged (not only the negation scope). Negation marks are tagged as key elements. The **negative sense preserving** negation switching occurs when the scope of negation in the two texts is significantly different and that changes the overall meaning. A special case of negative sense preserving negation switching is when one of the texts (sentences) is affirmative, and the other is negative.

- Positive sense preserving:

In order to move us, it needs no reference to any recognized original.
One does not need to recognize a tangible object to be moved by its artistic representation.

- Negative sense preserving:

Frege did not say that Hesperus is Phosphorus.
Frege said that Hesperus is not Phosphorus.

A.3.4.3 Ellipsis

Definition: This tag includes linguistic ellipsis, i.e., those cases in which the elided snippets can be recovered through linguistic mechanisms. In (a), in the first member of the pair the idea of “being able to change to” is expressed twice; in the second member of the pair it is only expressed once due to elision. The whole linguistic unit suffering the modification is tagged (not only the elided snippets). All appearances of the elided snippet in both sentences are tagged as key elements: the idea of “being able to change to” in (a). Ellipsis is always **sense preserving**.

- a) - Thus, chemical force **can become** electrical current and that current **can change back** into chemical being.
- So we **can change** chemical force into the electric current, or the current into chemical force.

N.B.: When the elided snippets cannot be recovered solely through linguistic mechanisms, they must be considered DELETIONS.

A.3.4.4 Coordination changes

Definition: Changes in which one of the members of the pair contains coordinated snippets. This coordination is not present (in (a) it changes to a juxtaposition) or changes its position and/or form (b) in the other member of the pair. Only the coordinated or juxtaposed linguistic units are tagged. Only the coordination (not juxtaposition) marks are tagged as key elements. Coordination changes are always **sense preserving**.

- a) I like pears **and** apples.
I like pears. I like apples
- b) Older plans **and** contemporary ones
Old **and** contemporary plans

N.B.: When the alternation takes place between, on the one hand, coordinated or juxtaposed units and, on the other hand, subordinated or nested units, the phenomenon is tagged as SUBORDINATION & NESTING.

A.3.4.5 Subordination and Nesting changes

Definition: Changes in which one of the members of the pair contains a subordination (a) or a nesting (b). This subordination or nesting is not present (in (a) and (b) it changes to a juxtaposition) or changes the position and/or form (c) in the other member of the pair. Nesting is understood as a general term meaning that something is embedded in a bigger unit. Only the linguistic units involved in the subordination or nesting, as well as the coordinated and juxtaposed units, are tagged. In case a conjunction, a relative pronoun or a preposition are present, they are tagged as the key elements (a and c). In case they are not present, the whole subordinated or nested snippet is tagged (b). Juxtaposition or coordination elements are not tagged as key elements. Subordination and Nesting changes are always **sense preserving**.

- a) A building, **which** was devastated by the bomb, was completely destroyed.
A building was devastated by the bomb. It was completely destroyed.

- b) Patrick Ewing scored **a personal season high** of 41 points.
 Patrick Ewing scored 41 points. It was a personal season high
- c) The conference venue is in the building whose roof is red .
 The conference venue is in the building with red roof .

A.3.5 Discourse based changes

These tags stand for those changes that take place at the discourse level of language. This type gathers phenomena that are very different in nature, though all having in common that consist in structural changes not affecting the argumental elements in the sentence. The phrase/clause/sentence(s) suffering the modification is(are) tagged. Moreover, a key element should be tagged in all discourse based tags.

A.3.5.1 Punctuation changes

Definition: Changes in the punctuation (a). Cases consisting of linguistic mechanisms parallel to punctuation like (b) are also considered here. The changing punctuation signs are tagged as key elements. The whole linguistic unit(s) suffering the modification is(are) tagged. Punctuation is always **sense preserving**.

- a) This, as I see it, is wrong .
 This – as I see it – is wrong.
- b) - You will purchase a return ticket to Streatham Common and a platform ticket at Victoria station .
 - At Victoria Station you will purchase (1) a return ticket to Streatham Common and (2) a platform ticket

Sometimes occurs that several changes in the punctuation take place at the same time. These multiple changes are considered as a single phenomenon if they take place at the same level (between phrase, between clause or between sentence), like in (c). If they belong to different levels, they are tagged as separate phenomena: two changes in the punctuation take place in (d), repeated in (e), but they are annotated as independent paraphrase phenomena: one of them is tagged in (d) and the other in (e).

- c) I know she is coming. She will be fine; I know it .
 I know she is coming; she will be fine. I know it .
- d) I need to buy a couple of things. Then, I will come .
 I need to buy a couple of things; then I will come .

- e) I need to buy a couple of things. Then , I will come .
 I need to buy a couple of things. then I will come .

A.3.5.2 Direct/Indirect style alternations

Definition: Changing direct style for indirect style, and vice versa. The whole linguistic unit suffering the modification is tagged. The conjunction in the indirect style is tagged as key element. If no conjunction is present, the whole subordinate clause is tagged. The **negative sense preserving** Direct/Indirect Style alternations do not trigger the appropriate changes for pronoun resolution.

- Positive sense preserving:

She is mine, said the Great Spirit.
 The Great Spirit said **that** she is hers.

- Negative sense preserving:

I'm on my way!, said Peter and hung up his phone .
 Peter called Ana to tell her **that** she is on her way .

A.3.5.3 Sentence modality changes

Definition: Cases in which there is a change of modality (a). We are referring strictly to changes between affirmative, interrogative, exclamatory and imperative sentences. The whole unit suffering the modification is tagged. The elements that change are tagged as key elements. Modality change is always **sense preserving**.

- a) **Can** I make a reservation?
I'd like to make a reservation.

N.B.: In MODAL VERB tags, in contrast, only modal verb alternations are involved.

A.3.5.4 Syntax/Discourse Structure

Definition: This tag is used to annotate other changes in the structure of the sentences not considered in the syntax and discourse based tags above: (a), (b) and (c). The linguistic unit(s) suffering the modification is(are) tagged. The elements that change are tagged as key elements.

- a) John wore his best suit to the dance last night .
It was John **who** wore his best suit to the dance last night .

- b) He wanted to eat **nothing but** apples .
All he wanted to eat **were** apples.
- c) **You are very** courageous .
You have shown how courageous **you are** .

A.3.6 Other changes

This class gathers those changes that are related to more than one of the classes and subclasses in our typology, as they can take place in any of them.

A.3.6.1 Addition/Deletion

Definition: Deletion of lexical and functional units. In the **negative sense preserving** case, the deletion leads to a significant modification of the meaning. Only the linguistic unit deleted is tagged. When a functional unit is deleted together with a lexical unit, this functional unit is included in the scope. Normally, the scope of Addition/Deletion is only in one of the two texts, as opposed to the other types, which are pairwise.

- Positive sense preserving:
One day, she took a hot flat-iron, removed my clothes, and held it on my naked back until I howled with pain.
As a proof of bad treatment, she took a hot flat-iron and put it on my back after removing my clothes.
- Negative sense preserving:
Legislation making it harder for consumers to erase their debts in bankruptcy court won overwhelming House approval in March.
Legislation making it harder for consumers to erase their debts in bankruptcy court won speedy, House approval in March and was endorsed by the White House.

A.3.6.2 Change of order

Definition: This tag includes any type of change of order from the word level to the sentence level: (a), (b) and (c). Change of order is always **sense preserving**.

- a) She used to only eat hot dishes.
She used to eat only hot dishes.
- b) “I want a beer”, he said.
“I want a beer”, said he.

- c) They said : “We believe that the time has come for legislation to make public places smoke-free” .
 “The time has come to make public places smoke-free,” they wrote in a letter to the Times newspaper.

A.3.6.3 Semantic (General Inferences)

Definition: SEMANTICS BASED CHANGES tag stands for changes that imply a different lexicalisation pattern of the same content units. Typically the semantic relation between the two can only be determined through (common sense) reasoning. In the **negative sense preserving** case, the reasoning identifies contradiction and/or incompatibility.

- Positive sense preserving:

Uncle Tarek was born Aribert Ferdinand Heim.

The real name of Tarek Hussein Farid was Aribert Ferdinand Heim.

- Negative sense preserving:

Children were among the victims of a plane crash that killed as many as 17 people Sunday in Butte, Montana.

17 adults died in a plane crash in Montana.

A.3.7 Extremes

The following types stand for the extremes of the paraphrase continuum: identity on the one hand, and entailment and non-paraphrase on the other.

A.3.7.1 Identity

Definition: We annotate as IDENTICAL those linguistic units that are exactly the same in wording. Identical is always **sense preserving**.

- The two argued that only a new board would have had the credibility to restore El Paso to health.
The two believed that only a new board would have had the credibility to restore El Paso to health.

A.3.7.2 Non-paraphrase

Definition: Non-paraphrase includes fragments which do not have the same meaning (a), as well as cases in which we need extralinguistic information in order to establish a link between the members of the paraphrase pair: cases of

same illocutive value but different meaning (b), cases of subjectivity (c), cases of potential coreference (d), (e) and (f), etc.

- a) The two had argued that you shouldn't go there .
He and Zilkha believed that this is unfair .
- b) I want some fresh air.
Could you open the window?
- c) The U.S.-led invasion of Iraq .
The U.S.-led liberation of Iraq.
- d) They got married last year .
They got married in 2004 .
- e) I live here . I live in Barcelona .
- f) They will come later .
They will come this afternoon

N.B.: Paraphrase and coreference overlap considerably. Those cases that may corefer, but at the same time are paraphrases, should be annotated as paraphrases.

In cases (d), (e) and (f), the linguistic information is not enough to link the two members of the pair, we need to know which point in the time or in the space are we taking as reference. Thus, they are annotated as nonparaphrases. Cases in (g), (h) and (i) can be linked only through linguistic information (a year in the past, a 'city' type of entity, a masculine singular entity, respectively). Thus, they are annotated as paraphrases.

- g) They got married last year .
They got married a year ago .
- h) I live in Barcelona .
I live in a city .
- i) I love John .
I love him .

N.B.: Although sometimes a non-paraphrase fragment may actually affect the meaning of the full sentence, only the fragment in question will be tagged as NON-PARAPHRASE (j) and the rest of the sentence will be annotated independently of this fact.

- j) Mike and Lucy decided to leave .
Mark decided to leave .

N.B.: When two linguistic units having a different meaning are not aligned formally nor informatively, they should be tagged as two different ADDITION/DELETION cases (1 and 2 in k), not as NON-PARAPHRASES.

- k) Yesterday,₁ Google failed .
Google failed because of the crisis₂.

A.3.7.3 Entailment

Definition: Fragments having an entailment relation. **N.B.:** It should be noted that entailment relations are present in many paraphrase types (e.g. general/specific in SAME-POLARITY or ADDITION/DELETION). We will only use the ENTAILMENT tag when there is a substantial difference in the information content. Entailment is always **negative sense preserving**.

- Google was in talks to buy Youtube .
Google bought Youtube

A.4 Annotating non-paraphrases

Annotating non-paraphrases (negative examples of paraphrasing in the MRPC corpus) is a non-trivial task that has not been carried out for other paraphrase typology corpora. The non-paraphrases in the MRPC corpus have many of the properties of paraphrases, they have a very high degree of lexical and syntactic similarity. In a) we can see an example of a non-paraphrase pair. The two sentences talk about the same NEs (Yucaipa and Dominick) in the same syntactic-semantic roles of the same actions (buying, selling, owning). At the same time, there are key differences between the two sentences – the price of the sale in the first sentence is \$2.5 billion, while in the second it is \$1.8 billion.

- a) Yucaipa owned Dominick's before selling the chain to Safeway in 1998 for \$2.5 billion.
 Yucaipa bought Dominick's in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.

Due to the complex nature of the non-paraphrasing, the annotation of these pairs goes in three steps

- 1) (Re)evaluation of the paraphrasing or non-paraphrasing relation between the two sentences as a whole (this is the first step for both paraphrases and non-paraphrases).

- 2) (After the pair has been annotated as non-paraphrases) Annotation of the non-sense-preserving phenomena, responsible for the non-paraphrasing label of the pair.
- 3) Annotation of the sense-preserving phenomena, responsible for the high degree of similarity between the two sentences.

An example annotation of the pair in a) follows:

- 1) The relation between the two sentences is non-paraphrases
- 2) The non-sense-preserving phenomena responsible for the “non-paraphrase” label of the pair is “Lexical Substitution (Named Entities)”:
 Yucaipa owned Dominick’s before selling the chain to Safeway in 1998 for \$2.5 billion.
 Yucaipa bought Dominick’s in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.
- 3) The sense-preserving phenomena, responsible for the high degree of similarity are:
 - a. Same polarity substitution (contextual)
 Yucaipa owned Dominick’s before selling the chain to Safeway in 1998 for \$2.5 billion.
 Yucaipa bought Dominick’s in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.
 - b. Entailment
 Yucaipa owned Dominick’s before selling the chain to Safeway in 1998 for \$2.5 billion.
 Yucaipa bought Dominick’s in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.
 - c. Inflectional changes
 Yucaipa owned Dominick’s before selling the chain to Safeway in 1998 for \$2.5 billion.
 Yucaipa bought Dominick’s in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.
 - d. Order
 Yucaipa owned Dominick’s before selling the chain to Safeway in 1998 for \$2.5 billion.
 Yucaipa bought Dominick’s in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998.

e. Addition/Deletion

Yucaipa owned Dominick's before₁ selling the chain to Safeway in 1998 for \$2.5 billion.

Yucaipa bought Dominick's in 1995 for \$693 million and₂ sold it to Safeway for \$1.8 billion in 1998.

f. Identity

Yucaipa owned Dominick's before selling the chain to Safeway in 1998 for \$2.5 billion , Yucaipa bought Dominick's in 1995 for \$693 million and sold it to Safeway for \$1.8 billion in 1998 .

A.5 Annotating negation

Annotating negation within paraphrases is a novel approach. For the pilot annotation we will mark the scope as negation and the negation cue as a “key”.

- We did **not** drive up to the door but got down near the gate of the avenue .