

# **SemAnTE Annotation Guidelines**

Version: 1.0

This document describes the annotation guidelines we developed to instruct the annotators of SemAnTE. Firstly we explain the motivation for the approach taken and then we focus on certain principles of inference and describe the annotation guidelines.

*Annotation SemAnTE 1.0:*

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The SemAnTE resource is free for download for non-commercial usage:

<http://logiccommonsense.wp.hum.uu.nl/resources/>

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## Data sets

The datasets to annotate are the development and test sets of RTE 1-4.

RTE	Dataset	Entries count
1	Development	567
	Test	800
2	Development	800
	Test	800
3	Development	800
	Test	800
4	Test	1000

Each entry consists of four elements:

1. Date-set/pair Id: Dev/Test1-7/0-1000
2. Text: String of text
3. Hypothesis: String of text
4. Entailment: Yes/No

Example:

1. Dataset/Pair: Test2/282<sup>1</sup>
2. Text: Senator Hill and Foreign Affairs Minister Alexander Downer will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.
3. Hypothesis: Alexander Downer will host a conference.
4. Entailment: Yes

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<sup>1</sup> Test2/282 means: RTE 2 test set, entry id 282. We use this convention throughout this document.

## Approach

Given a text and a hypothesis for which the entailment relation holds, we aim at annotating the phenomena that are used in the inference and therefore critical for the validity of the entailment. In this view, the entailment is treated as a global inference made up of a set of local inferences, whereby each inference is manifested by a different phenomenon in the language.

For example, in entry Test2/282 discussed above, an analysis of the conjunction “Senator Hill and Foreign Affairs Minister Alexander Downer will host...” is necessary in order to make the (local) inference that “Foreign Affairs Minister Alexander Downer will host...”. The important point is that the semantics of the conjunctive construction licenses the inference that the proposition in which it is embedded is true of each conjunct (i.e. “Senator Hill” and “Foreign Affairs Minister Alexander Downer”).

Let F denote the set of phenomena to annotate. This set consists of:

1. Restrictive Modification (including Relative-Clauses)
2. Conjunction<sup>2</sup>
3. Appositive Constructions

Each phenomenon is described in detail in the section “Phenomena to Annotate (the set F)”.

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<sup>2</sup> Although Conjunction and Restrictive Modification were separated for 3 reasons:

1. -mod is defined as a phenomenon involving an asymmetric construction (modifiee + modifier) while conjunction is defined as a phenomena based on a symmetric construction (e.g.: NP, NP, NP and NP) in which all elements have the same semantic role).
2. It is a specific construction that annotators will recognize based on the occurrences of specific symbols: “,” and “and”.

## Annotation Workflow

Given an entry from the RTE, the task is as follows:

1. Read the Hypothesis
2. Read the Text and verify the entailment
3. Describe informally (in text) why the entailment holds.
4. Annotate each phenomenon from set F that is used in the inference.

Example: Given entry Test2/282

1. Read the Hypothesis: “Alexander Downer will host a conference”
2. Read the Text and verify the entailment:

“Senator Hill and Foreign Affairs Minister Alexander Downer will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.”
3. Describe informally why the entailment holds:

“Alexander Downer” is claimed in the hypothesis to be the host of a conference, and he is also mentioned in the text as the host (together with another person) of a conference (a specific one).
4. The phenomena used in the inference:
  - a. Conjunction:

“[Senator Hill **and** Foreign Affairs Minister Alexander Downer] will host...”

The semantics of conjunction enables the inference:

“Foreign Affairs Minister Alexander Downer will host... “
  - b. Restrictive Modification:

“[Foreign Affairs Minister] Alexander Downer”

The semantics of restrictive modification enables the inference:

“[Foreign Affairs Minister] Alexander Downer” → “Alexander Downer”
  - c. Restrictive Modification:

“[the 20th annual AUSMIN (Australia-United States ministerial consultations)] conference”

The semantics of restrictive modification enables the inference:

“[the 20th annual AUSMIN (Australia-United States ministerial consultations)]  
conference”  $\rightarrow$  “conference”

d. Restrictive Modification:

“conference [at the Adelaide Town Hall]”

The semantics of restrictive modification enables the inference:

“conference [at the Adelaide Town Hall]”  $\rightarrow$  “conference”

Each phenomenon in this list enables a local inference that is critical for validating the global inference (T  $\rightarrow$  H).<sup>3</sup>

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<sup>3</sup> Note that the phenomena in this list do not constitute a sufficient condition for the inference in this example. The Inference: Alexander Downer will host the conference  $\rightarrow$  Alexander Downer will host a conference is not covered by the set F.

## Clarification on Terminology

Due to terminology confusion in the use of the word *restrictive* in the terms *restrictive modification* and *restrictive relative clause*, we name relative clauses as follows:

- Appositive Relative Clauses – convey an independent assertion about the referent of their associated head, as in (A) below.<sup>4</sup> This type of relative clauses is manifested in the syntax by a comma construction: *NP, CP*,
- Intersective Relative Clauses – are interpreted as intersective predicate modifiers, restricting the reference of their head, as in (B) below.<sup>5</sup> This type of relative clauses is manifested in the syntax without a comma between the NP and the CP: *NP CP*,

Example:

- A. The prince, who was wounded, withdrew from the battle.  
➔ There is a single prince, this prince was wounded, and he withdrew from the battle.
- B. The prince who was wounded, withdrew from the battle.  
➔ From all princes in the context of utterance, the exact same prince who was wounded, is the one who withdrew from the battle.

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<sup>4</sup> This type of relative clause is usually known as a “non-restrictive relative clause” in the linguistic literature.

<sup>5</sup> This type of relative clause is usually known as a “restrictive relative clause” in the linguistic literature.

## Phenomena to Annotate (the set F)

### 1. Restrictive Modification

#### Definition

A restrictive modification is a semantic phenomenon whereby a juxtaposition of a modifyee and a modifier (e.g. *student of physics*) allows to infer that the modifyee holds in its containing proposition regardless of its modifier (i.e. *John talked to a student of physics* → *John talked to a student*). Typical cases of restrictive modification involve inferences such as:

- $N\ PP \rightarrow N$  (Modifyee: N; Modifier: PP; e.g. *student of physics* → *student*)
- $AP\ N \rightarrow N$  (Modifyee: N; Modifier: AP; e.g. *tall boy* → *boy*)
- $V\ AdvP \rightarrow V$  (Modifyee: V; Modifier: AdvP; e.g. *ran quickly* → *ran*)
- $AdvP\ A \rightarrow A$  (Modifyee: A; Modifier: AdvP; e.g. *very tall* → *tall*)

#### Notes

- Appositive relative clauses are also instances of restrictive modification as they allow an inference of the kind NP, CP, → NP (e.g. *John, who is a tall guy, talked to his teacher* → *John talked to his teacher*). We analyze them as a separate subtype of restrictive modification below.
- We will not make a distinction between intersective and non-intersective modification in the scope of this schema. Thus, we will not distinguish cases like *blue car*, where both the modifier *car* and the modifyee *blue* are entailed, from case like *small elephant*, where it's unclear that the modifyee is entailed (a small elephant can be quite big).

#### Examples

1. Test2/200/yes

Microsoft maintains their very successful operating system monopoly through the use of proprietary specifications as well as aggressive marketing.

- a. Modifiee: monopoly  
Modifier: operating system
- b. Modifiee: operating system monopoly  
Modifier: very successful

2. Test3/640/yes

Self-containing flats will be provided to enable hostel residents to move into long-term accommodation, while Salvation Army social workers and volunteers have been trained in outreach work to make contact with homeless people on the streets

- a. Modifiee: people<sup>6</sup>  
Modifier: homeless
- b. Modifiee: people  
Modifier: on the streets

### Semantic Analysis and Inferences

By definition, a proposition that contains a restrictive modification - <Modifiee, Modifier> - expresses an assertion about truth-conditions describing a modifiee in a restricted scope and therefore in upward entailing environments licenses the inference that the same proposition is true also with the modifier omitted. For example:

- Microsoft maintains their very successful operating system monopoly through the use of proprietary specifications as well as aggressive marketing.  
→ Microsoft maintains their monopoly through the use of proprietary specifications as well as aggressive marketing.
- Self-containing flats will be provided to enable hostel residents to move into long-term accommodation, while Salvation Army social workers and volunteers have been trained in outreach work to make contact with homeless people on the streets  
→ Self-containing flats will be provided to enable hostel residents to move into long-term accommodation, while Salvation Army social workers and volunteers have been trained in outreach work to make contact with people.

---

<sup>6</sup> The expression *homeless people on the streets* can be analyzed either as [homeless [people on the streets]] or as [[homeless people] on the streets]. We analyze it by a flat structure – [homeless] people [on the street].



Notice that in a downward entailing environment, the subsumption principle licenses an inference in the opposite direction (e.g. not <Modifiee> → not <Modifiee, Modifier>):

- Microsoft maintains no monopoly through the use of proprietary specifications as well as aggressive marketing.
  - ➔ Microsoft maintains no very successful operating system monopoly through the use of proprietary specifications as well as aggressive marketing.

## When to Annotate

In instances in which the entailment is supported by a restrictive modification inference of the form *Modifiee Modifier* → *Modifiee* (whereby each part can be either in the text or in the hypothesis), the relevant segments in the text/hypothesis should be annotated.

## Example when not to annotate

Consider the following case of entailment (dev1/234/yes):

- Text: Only a week after it had no comment on upping the storage capacity of its Hotmail e-mail service, Microsoft early Thursday announced it was boosting the allowance to 250MB to follow similar moves by rivals such as Google, Yahoo, and Lycos.
- Microsoft's Hotmail has raised its storage capacity to 250MB.

The modification of *Thursday* by *early* is not needed in order to validate the inference.

Therefore, this restrictive modification of *Thursday* should not be annotated.

## Annotation Schema

For the instance of *Modifiee Modifier*:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="rmod_full_const">
    <complexType>
      <attribute name="Modifiee" type="xs:string" use="required"/>
      <attribute name="Modifier" type="xs:string" use="required"/>
      <attribute name="construction_id" type="xs:integer " use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

```

        </complexType>
    </element>
</schema>

```

For the instance of *Modiffee*:

```

<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="reference_to">
    <complexType>
      <attribute name="construction_id" type="xs:integer" use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>

```

## Annotation Examples

### 1. Test2/282/yes

- Text: Senator Hill and Foreign Affairs Minister Alexander Downer will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.
- Hypothesis: Alexander Downer will host a conference.
- Text Annotation:
  - RMod: the 20th annual AUSMIN (Australia-United States ministerial consultations) conference
  - Modiffee: conference
  - Modifier: the 20th annual AUSMIN (Australia-United States ministerial consultations)
  - Construction id: 1
  - RMod: conference at the Adelaide Town Hall
  - Modiffee: conference
  - Modifier: at the Adelaide Town Hall
  - Construction id: 2

- Hypothesis Annotation<sup>7</sup>:
  - Reference: conference
  - Construction\_id = 1
  - Reference: conference
  - Construction\_id = 2

## 2. Dev3/403/yes

- Text: Two of Gianni Versace's favorite buzzwords were quality and future, so after the 50-year-old designer was murdered last July outside his Miami Beach, Fla. mansion, it was somehow inevitable that his family would have to go about putting those words together: They had to ask themselves how they could ensure the future of the company Versace had built without sacrificing its reputation for quality.
- Hypothesis: Gianni Versace is a designer.
- Text Annotation:
  - RMod: the 50-year-old designer
  - Modifiee: designer
  - Modifier: 50-year-old
  - Construction id: 1
- Hypothesis Annotation:
  - Reference: designer
  - Construction\_id = 1

## 3. Dev3/127/yes

- Text: As late as 1799, priests were still being imprisoned or deported to penal colonies and persecution only worsened after the French army led by General Louis Alexandre

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<sup>7</sup> Note that this represents a flat structure: there are two restrictive modification inferences in this case:

1. the 20th annual AUSMIN (Australia-United States ministerial consultations) conference → conference
2. conference at the Adelaide Town Hall → conference

The two inferences are annotated as two instances of restrictive modification of the same modifiee. This is because the schema allows only a single modifier in every annotated instance.

Berthier captured Rome and imprisoned Pope Pius VI, who would die in captivity in Valence, Drôme, France in August of 1799.

- Hypothesis: Pope Pius VI died in France

- Text Annotation:

- RMod: die in captivity
- Modifiee: die
- Modifier: in captivity
- Construction id: 1

- RMod: die in August of 1799
- Modifiee: die
- Modifier: in August of 1799
- Construction id: 2

- Hypothesis Annotation:

- Reference: die
- Construction\_id = 1

- Reference: die
- Construction\_id = 3

Note: this analysis captures the inferences:

1. *die in captivity* → *die*
2. *die in August of 1799* → *die*

However, it does not capture the inference *in Valence, Drôme, France* → *in France* because this is a special kind of inference in appositive constructions involving locations.

## 2. Conjunction

### Definition

A conjunction in this document is a sequence of constituents/phrases separated by commas and ‘and’ that occupy a single position in the syntax (e.g. the subject position) and has a distributive interpretation for each member of the construction in the proposition it appears in.

### Examples

1. Test2/282/yes

Senator Hill and Foreign Affairs Minister Alexander Downer will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.

→

- a. Senator Hill will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.
- b. Foreign Affairs Minister Alexander Downer will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.

2. Test2/365/yes

Nixon was impeached and became the first president ever to resign on August 9th 1974.<sup>8</sup>

→

- a. Nixon was impeached on August 9th 1974
- b. Nixon became the first president ever to resign on August 9th 1974

3. Test3/640/yes

Self-containing flats will be provided to enable hostel residents to move into long-term accommodation, while Salvation Army social workers and volunteers have been trained in outreach work to make contact with homeless people on the streets.<sup>9</sup>

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<sup>8</sup> There is a syntactic ambiguity here – whether the PP “on August 9<sup>th</sup> 1974” is attached to the full VP or only to the second conjunct. The analysis here is for the interpretation in which it is attached to the full VP.

<sup>9</sup> There is another way to interpret the conjunction in this sentence: *Salvation Army [social workers and volunteers]* – in this reading the text “Salvation Army” is not part of the annotated phenomenon.

→

- a. Self-containing flats will be provided to enable hostel residents to move into long-term accommodation, while Salvation Army social workers have been trained in outreach work to make contact with homeless people on the streets
- b. Self-containing flats will be provided to enable hostel residents to move into long-term accommodation, while volunteers have been trained in outreach work to make contact with homeless people on the streets

### Semantic Analysis and Inferences

By definition, a proposition P that contains a conjunction -  $\langle \text{Element}_1, \text{Element}_2, \dots, \text{Element}_N \rangle$  that allows a distributive reading licenses N inferences:

For each conjunct  $\text{Element}_i$  of the conjunction:  $P(\langle \text{Element}_1, \dots, \text{Element}_N \rangle) \rightarrow P(\langle \text{Element}_i \rangle)$ .

For example: John talked to Mary and Sue  $\rightarrow$  John talked to Mary; John talked to Sue.

### Annotation Schema

For the instance of “ $\text{Element}_1, \text{Element}_2, \dots, \text{Element}_N$ ”:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="conjunction">
    <complexType>
      <attribute name="E1" type="xs:string" use="required"/>
      <attribute name="E2" type="xs:string" use="required"/>
      <attribute name="E3" type="xs:string" use="required"/>
      <attribute name="E4" type="xs:string" use="required"/>
      <attribute name="E5" type="xs:string" use="required"/>
      <attribute name="construction_id" type="xs:integer" use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

For the instance of “ $\text{Element}_i$ ”:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="reference_to">
    <complexType>
      <attribute name="construction_id" type="xs:integer" use="required"/>
    </complexType>
  </element>
</schema>
```

```

        <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
</element>
</schema>

```

## Annotation Examples

### 1. Test2/282/yes

- Text: Senator Hill and Foreign Affairs Minister Alexander Downer will host the 20th annual AUSMIN (Australia-United States ministerial consultations) conference at the Adelaide Town Hall.
- Hypothesis: Alexander Downer will host a conference.
- Text Annotation:
  - Conjunction: Senator Hill and Foreign Affairs Minister Alexander Downer
  - E1: Senator Hill
  - E2: Foreign Affairs Minister Alexander Downer
  - Construction id: 1
- Hypothesis Annotation:
  - Reference: Alexander Downer
  - Construction\_id = 1

### 2. Test2/365/yes

- a. Text: Nixon was impeached and became the first president ever to resign on August 9th 1974.
- b. Hypothesis: Nixon was the first president ever to resign.
- c. Text Annotation:
  - i. Conjunction: was impeached and became the first president ever to resign on August 9th 1974.
  - ii. E1: was impeached
  - iii. E2: became the first president ever to resign on August 9th 1974.
  - iv. Construction id: 1
- d. Hypothesis Annotation:

- i. Reference: the first president ever to resign<sup>10</sup>
- ii. Construction\_id = 1

### 3. Apposition

#### Definition

Apposition is a pair of two adjacent noun phrases - App-Part1 and App-Part2 – separated by comma, whereby both parts describe/refer to the same entity in the world. Often, one part of an apposition refers to the designated entity by its name and the other provides additional information about it that is relevant in the context of utterance.

#### Examples

1. Dev1/561

The incident in Mogadishu, the Somali capital, came as U.S. forces began the final phase of their promised March 31 pullout.

App-Part1: [Mogadishu]

App-Part2: [the Somali capital]

Apposition: [Mogadishu, the Somali capital,]

2. Dev2/397:

The widow of John Lennon, Yoko Ono, may take legal action against a new breakfast cereal called “Strawberry Fields” which she believes is too close in name to Lennon’s song.

App-Part1: [The widow of John Lennon]

App-Part2: [Yoko Ono]

Apposition: [The widow of John Lennon, Yoko Ono,]

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<sup>10</sup> Note that the reference is only to an internal part of an element in the conjunction.



## Semantic Analysis and Inferences

The expression of an apposition comprised of its two parts - *App-Part1* and *App-Part2*:

“<App-Part1>, <App-Part2>,”.

Since both parts of an apposition describe the same entity, a proposition containing an apposition shall render the same truth-conditions with and without each one of its parts. This allows us to render two inferences from each instance of apposition.

For example:

- The incident in Mogadishu, the Somali capital, came as U.S. forces began the final phase of their promised March 31 pullout
  - ➔ The incident in Mogadishu came as U.S. forces began the final phase of their promised March 31 pullout
  - ➔ The incident in the Somali capital came as U.S. forces began the final phase of their promised March 31 pullout

In addition to that, two additional inferences can be drawn from the assumption that both parts describe/refer to the same entity. Thus:

- The incident in Mogadishu, the Somali capital, came as U.S. forces began the final phase of their promised March 31 pullout.
  - ➔ Mogadishu is the Somali capital
  - ➔ the Somali capital is Mogadishu

Generally, given a proposition P containing an Apposition:  $P = [...App-Part1, App-Part2, ...]$

1.  $P \text{ is true} \rightarrow [...App-Part1...] \text{ is true}$
2.  $P \text{ is true} \rightarrow [...App-Part2...] \text{ is true}$
3.  $P \text{ is true} \rightarrow [...App-Part1...] \text{ equals } [...App-Part2...]$
4.  $P \text{ is true} \rightarrow [...App-Part2...] \text{ equals } [...App-Part1...]$

## When to Annotate

In entries in which the entailment depends on one of the inferences drawn from an apposition the relevant segments of the apposition in the text and hypothesis should be annotated.

## Annotation Schema

For the instance of <app-part1>, <app-part2>, :

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="Apposition_Text">
    <complexType>
      <attribute name="app-part1" type="xs:string" use="required"/>
      <attribute name="app-part2" type="xs:string" use="required"/>
      <attribute name="construction_id" type="xs:integer " use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

For instances of parts of an apposition that the full construction is subsumed to:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="reference_to">
    <complexType>
      <attribute name="construction_id" type="xs:integer" use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

## Examples from the RTE

### 1. Dev2/378/Yes:

- Text: Cote d'Ivoire's President, Laurent Gbagbo, promulgated new election laws on July 14.
- Hypothesis: President Laurent Gbagbo lives in Cote d'Ivoire.
- Text Annotation:
  - Apposition: Cote d'Ivoire's President, Laurent Gbagbo,
  - App-Part1: Cote d'Ivoire's President
  - App-Part2: Laurent Gbagbo
  - Construction\_id = 1
- Hypothesis Annotation:

- Reference: Laurent Gbagbo
- Construction\_id = 1

2. Dev1/581/Yes:

- Text: To the world, M. Larry Lawrence, the new U.S. emissary to Switzerland who hosted President Clinton on his Southern California vacation, will be known as Mr. Ambassador.
- Hypothesis: Larry Lawrence is the head of the U.S. Embassy in Switzerland
- Text Annotation:
  - Apposition: M. Larry Lawrence, the new U.S. emissary to Switzerland who hosted President Clinton on his Southern California vacation,
  - App-Part1: M. Larry Lawrence
  - App-Part2: the new U.S. emissary to Switzerland who hosted President Clinton on his Southern California vacation
  - Construction\_id = 1
- Hypothesis Annotation:
  - Reference: Larry Lawrence
  - Construction\_id = 1
  - Reference: the head of the U.S. Embassy in Switzerland
  - Construction\_id = 1

3. Dev3/33/Yes:

- Text: As leaders gather in Argentina ahead of this weekends regional talks, Hugo Chávez, Venezuela's populist president, is using an energy windfall to win friends and promote his vision of 21st-century socialism.
- Hypothesis: Chávez is a follower of socialism
- Text Annotation:
  - i. Apposition: Hugo Chávez, Venezuela's populist president,

- ii. App-Part1: Hugo Chávez
- iii. App-Part2: Venezuela's populist president
- iv. Construction\_id = 1

- Hypothesis Annotation:
  - i. Reference: Chávez
  - ii. Construction\_id = 1

#### 4. Dev1/561/Yes

- Text: The incident in Mogadishu, the Somali capital, came as U.S. forces began the final phase of their promised March 31 pullout.
- Hypothesis: The capital of Somalia is Mogadishu.
- Text Annotation:
  - Apposition: Mogadishu, the Somali capital,
  - App-Part1: Mogadishu
  - App-Part2: the Somali capital
  - Construction\_id = 1
- Hypothesis Annotation:
  - Reference: The capital of Somalia
  - Construction\_id = 1
  - Reference: Mogadishu
  - Construction\_id = 1

#### Note

In some cases the hypothesis does not refer to a complete part of an apposition but rather only to partial information that is conveyed in this apposition. For example:

Dev1/581/Yes:

- Text: To the world, M. Larry Lawrence, the new U.S. emissary to Switzerland who hosted President Clinton on his Southern California vacation, will be known as Mr. Ambassador.

- Hypothesis: Larry Lawrence is the head of the U.S. Embassy in Switzerland

The reference from *the head of the U.S. Embassy in Switzerland* is only to part of the information given by the apposition – *the new U.S. emissary to Switzerland who hosted President Clinton on his Southern California vacation*.

In some other cases, the reference from the hypothesis is to a complete part of an apposition that appear in the text but by using a different syntax: e.g. (*The capital of Somalia* → *the Somali capital* in Dev1/561)

We annotate all these cases as long as the apposition/r-mod is critical for the validity of the entailment and assuming that the instance of an element appearing in the hypothesis can be inferred from the instance in the text based on world knowledge and the understanding of the text solely. For both appositions and restrictive modifications in which the subsumption is not directly visible in T, we require an extra inference between the form in T and a modified or inferred form in H. The inference  $X \rightarrow X'$  must be possible independent of the relation between T and H. Thus, regardless of the contents of H and with only world knowledge, if T considered as valid sentence,  $X \rightarrow X'$  must be a valid inference.

## 4. Title Constructions

### Definition

Titles are pairs of two NPs – *Title* and *Entity* – not separated by a comma, whereby one part refers to some entity in the world and the other part to a property of that entity, predicating on it. Semantically, this is an instance of apposition because the semantic analysis and inferences are the same as appositions, and tend to differ only in the lack of a comma. However, we annotate this construction by a dedicated scheme.

### Example

Dev1/567:

Prime Minister Silvio Berlusconi was elected March 28 with a mandate to reform Italy's business regulations and pull the economy out of recession.

Title: [Prime Minister]

Entity: [Silvio Berlusconi]

Title construction: [Prime Minister Silvio Berlusconi]

### Annotation Schema

For the instance of `<title>` `<entity>`:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="title">
    <complexType>
      <attribute name="title" type="xs:string" use="required"/>
      <attribute name="entity" type="xs:string" use="required"/>
      <attribute name="construction_id" type="xs:integer" use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

For an instance of the title- or the entity-part that a title construction is subsumed to:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
```

```

<element name="reference_to">
  <complexType>
    <attribute name="construction_id" type="xs:integer" use="required"/>
    <attribute name="comment" type="xs:string" use="optional"/>
  </complexType>
</element>
</schema>

```

## 5. Relative Clause

### Definition

Relative clause is a pair of two adjacent phrases whereby the first is a noun phrase referencing some entity in the world – a modifiee, and the second is a clause, generally headed by a wh-word, which adds information about the entity mentioned. For this reason, appositive relative clauses are treated as instances of restrictive modification.<sup>11</sup> For annotation purposes, we define a dedicated schema for relative clauses that is more specific than restrictive modification in general.

### Examples:

1. Dev1/569/yes

Government forces killed the head of the Armed Islamic Group, or GIA, which has claimed responsibility for killing 61 foreigners in the last year.

RC: the Armed Islamic Group, or GIA, which has claimed responsibility for killing 61 foreigners in the last year

Modifiee: the Armed Islamic Group, or GIA

Modifier-Clause: which has claimed responsibility for killing 61 foreigners in the last year

RC-Pronoun: which

2. Dev1/140/yes

---

<sup>11</sup> In the scope of this annotation schema we do not ask annotators to distinguish between appositive and intersective relative clauses. Later on we can use an automatic tool to classify each instance based on syntactic cues.

A senior coalition official in Iraq said the body, which was found by U.S. military police west of Baghdad, appeared to have been thrown from a vehicle.

RC: the body, which was found by U.S. military police west of Baghdad,

Modifiee: the body

Modifier-Clause: which was found by U.S. military police west of Baghdad

RC-Pronoun: which

1. Dev5/180/yes

The institute's breakthrough came about after it set out to examine Thür's belief that an octagonal tomb in the remains of the Roman city of Ephesus contained the body of Arsinöe. According to Roman texts the city, in what is now Turkey, is where Arsinöe was banished after being defeated in a power struggle against Cleopatra and her then lover, Julius Caesar. Arsinöe was said to have been murdered after Cleopatra, now with Mark Antony following Caesar's death, ordered the Roman general to have her younger sibling killed to prevent any future attempts on the Egyptian throne.

RC: Cleopatra, now with Mark Antony following Caesar's death,

Modifiee: Cleopatra

Modifier-Clause: now with Mark Antony following Caesar's death

RC-Pronoun: NULL

## Semantic Analysis and Inferences

By definition, a proposition that contains a relative clause - <Modifiee, Modifier-Clause> - expresses an assertion about truth-conditions describing this modifiee modified by the clause and therefore in upward entailing environments the construction licenses the inference that the same proposition is true also with the clause omitted. For example:

- Government forces killed the head of the Armed Islamic Group, or GIA, which has claimed responsibility for killing 61 foreigners in the last year.  
➔ Government forces killed the head of the Armed Islamic Group, or GIA
- A senior coalition official in Iraq said the body, which was found by U.S. military police west of Baghdad, appeared to have been thrown from a vehicle.



➔ A senior coalition official in Iraq said the body appeared to have been thrown from a vehicle.

In addition, since the modifiee has a grammatical function either as the subject or the object in the subordinate clause, inferences can be drawn from the co-reference between the trace and the modifiee:

- Government forces killed the head of the Armed Islamic Group, or GIA, which has claimed responsibility for killing 61 foreigners in the last year.  
➔ The Armed Islamic Group, or GIA has claimed responsibility for killing 61 foreigners in the last year.
- A senior coalition official in Iraq said the body, which was found by U.S. military police west of Baghdad, appeared to have been thrown from a vehicle.  
➔ the body was found by U.S. military police west of Baghdad

## When to Annotate

In instances in which the entailment is supported by a relative clause inference of the form Modifiee (NP) Modifier-Clause (CP) → Modifiee (whereby each element may appear either in the text or the hypothesis), the relevant segments in the text/hypothesis should be annotated.

## Annotation Schema

For the instance of “Modifiee Modifier-Clause”:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="rclause_full_const">
    <complexType>
      <attribute name="Modifiee" type="xs:string" use="required"/>
      <attribute name="Clause" type="xs:string" use="required"/>
      <attribute name="Pronoun" type="xs:string" use="required"/>
      <attribute name="construction_id" type="xs:integer " use=" required "/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

For the instance of “Modifiee”:

```
<?xml version="1.0"?> <schema xmlns="http://www.w3.org/2000/10/XMLSchema">
  <!-- XSchema definition for Syntactic Constructions -->
  <element name="reference_to">
    <complexType>
      <attribute name="construction_id" type="xs:integer" use="required"/>
      <attribute name="comment" type="xs:string" use="optional"/>
    </complexType>
  </element>
</schema>
```

## Annotation Examples

### 1. Dev1/140/yes

- Text: A senior coalition official in Iraq said the body, which was found by U.S. military police west of Baghdad, appeared to have been thrown from a vehicle.
- Hypothesis: A body has been found by U. S. military police.
- Text Annotation:
  - i. RC: the body, which was found by U.S. military police west of Baghdad,
  - ii. Modifiee: the body
  - iii. Clause: which was found by U.S. military police west of Baghdad
  - iv. Pronoun: which
  - v. Construction\_id = 1
- Hypothesis Annotation:
  - i. Reference: A body has been found by U. S. military police
  - ii. Construction\_id = 1

### 2. Dev5/180/yes

- a. Text: The institute's breakthrough came about after it set out to examine Thür's belief that an octagonal tomb in the remains of the Roman city of Ephesus contained the body of Arsinöe. According to Roman texts the city, in what is now Turkey, is where Arsinöe was banished after being defeated in a power struggle against Cleopatra and her then lover, Julius Caesar. Arsinöe was said to have

been murdered after Cleopatra, now with Mark Antony following Caesar's death, ordered the Roman general to have her younger sibling killed to prevent any future attempts on the Egyptian throne.

b. Hypothesis: Queen Cleopatra ordered the assassination of her sister.

c. Text Annotation:

- RC: Cleopatra, now with Mark Antony following Caesar's death
- Modifiee: Cleopatra
- Clause: now with Mark Antony following Caesar's death
- Pronoun: NULL
- Construction\_id = 1

3. Hypothesis Annotation:

- Reference: Cleopatra
- Construction\_id = 1