TimeML Annotation Guidelines

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Contents

1   Introduction

This document describes the annotation guidelines for marking up text according to the TimeML language. It presents the results to date of discussions and trial annotations of the TERQAS annotation working group as well as modifications added during the TANGO workshop.

The document is organised as follows. The next section explains what the TimeML tags (XML elements) are and how to annotate them. It also specifies for each tag what its attributes are and provides a BNF definition for the tag and its attributes. While this exposition contains many examples illustrating what and how to tag, the examples focus, for clarity's sake, on the tag under discussion at any given point. The appendix found a the end of this chapter provides a set of fully annotated examples, illustrating all of the interactions between the various entity and relational tags.

For the sake of convenience, I&P(02) will be used to refer to [**?**] and TIDES(02), to [**?**] throughout the whole document.

2   Explanation of TimeML Tags and their Attributes

2.1   The tag `<EVENT>`

We consider "events" a cover term for situations that *happen* or *occur*. Events can be punctual (1-2) or last for a period of time (3-4). We also consider as events those predicates describing *states* or *circumstances* in which something obtains or holds true (5). Not all stative predicates will be marked up, however. See subsection 2.1.3, on events belonging to the class 'STATE'.

1. *Ferdinand Magellan, a Portuguese explorer, first* **reached** *the islands in search of spices.*

2. *A fresh flow of lava, gas and debris* **erupted** *there Saturday.*

3. *11,024 people, including local Aeta aborigines,* **were evacuated** *to 18 disaster relief centers.*

4. *"We're* **expecting** *a major eruption," he said in a telephone interview early today.*

5. *Israel has been scrambling to buy more masks abroad, after a* **shortage** *of several hundred thousand gas masks.*

2.1.1   How to annotate EVENTs

Events may be expressed by means of tensed or untensed verbs (1 and 2), nominalizations (3), adjectives (4), predicative clauses (5), or prepositional phrases (6):

1. *A fresh flow of lava, gas and debris* **erupted** *there Saturday.*

2. *Prime Minister Benjamin Netanyahu called the prime minister of the Netherlands* **to thank** *him for thousands of gas masks his country has already contributed.*

3. *Israel will ask the United States to delay a military* **strike** *against Iraq until the Jewish state is fully prepared for a possible Iraqi* **attack**.

4. *A Philippine volcano,* **dormant** *for six centuries, began exploding with searing gases, thick ash and deadly debris.*

5. *"There is no reason why we would not* **be prepared**," *Mordechai told the Yediot Ahronot daily.*

6. *All 75 people* **on board** *the Aeroflot Airbus died.*

Note that in the above sentences not all "markables" are tagged. In the first example, for instance, neither *flow* nor *Saturday* is marked.

The annotation of formally simple events (examples 1, 3, 4 and 6 above) is straightforward. However, formally complex events may be sequentially discontinuous in some contexts:

1. *There is no reason why we would not* **be prepared.**
   There is no reason why we would not **be** *fully* **prepared.**

2. *They will definitely* **take into consideration** *our readiness.*
   They will definitely **take** *it* **into consideration***.*

In order to avoid problems derived from tagging discountinuous sequences, employ the following strategies:

- If the event is expressed by a verbal phrase (*has been scrambling, to buy, were reported*), the EVENT tag will be applied only to its head, which is marked in bold face in the following examples:

  Israel has been **scrambling** *to* **buy** *more masks abroad.*
  No injuries were **reported***.*
  The private sector could **establish** *a private agency.*
  If we had been **attacked** *, ...*

  If the main verb falls within the scope of a modal auxiliary, as in the third example above, or a negative particle as in

  Kaufman did not **disclose** *details of the deal.*

  then the EVENT tag is only applied to the main verb. The modal and/or negation will be represented in the MAKEINSTANCE tag associated with the event in question – see section 2.4.

- If the main predicate is a phrasal verb, only the verbal part (and not its particle) will be marked:

  Additional distribution centers would be **set** *up next week.*

- If the event is expressed by a verbal cluster which consists of an aspectual verb and a main verb, both verbs will be tagged as independent events. Examples of aspectual verbs are: *begin, stop, end, keep,* etc. See subsection 2.1.3.

- If the aspectual verb is preceded by auxiliary forms (as in the last two examples below), the first criterion above will be applied as well. In the following examples, the underlining delimits the verbal cluster, whereas square brackets signal the scope of each EVENT tag:

  The private sector [**began**] [**establishing**] *a private agency.*
  If US had [**stopped**] [**interfering**] *in other countries policies long ago, ...*
  They probably would have[**began**] [**responding**] *to President Reagan's 600 ships plan with new construction.*

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- If the event is a nominalization which appears as the head of the NP along with other elements (specifiers, complements, modifiers), only the head element will be marked:

  > *The young industry's rapid* **growth** *also is attracting regulators eager to police its many facets.*

- If the event is a nominalization accompanied by some sort of light predicate (as shown by the underlined segments below), we will tag both elements.

  > *Several pro-Iraq* **demonstrations** *have* **taken** *place in the last week.*
  >
  > *They will definitely* **take** *into* **consideration** *our readiness.*

Both elements are tagged because both verbal and nominal heads are relevant to different kind of event information. The two tagged events will be related as `IDENTICAL` by the `relType` attribute in the `TLINK` tag (see section 3).

- If the event is a predicative clause, only the predicative element (the adjective or the nominal in the following examples) will be tagged. This is done by applying the test of headedness in order to decide what to mark:

  1. If the predicative element is ENDOCENTRIC (i.e. if it has a head), then we will tag the head only. In the following examples, the predicative element is underlined, whereas its head is marked in bold face:

     > *There is no reason why we would not be [fully* **prepared***].*
     > *If, in spite of everything, we will not be [***ready***], we will ask the United States to delay the operation.*
     > *James Pustejovsky was [***CTO** of LingoMotors] for several years.*

  2. If the predicative element is EXOCENTRIC (i.e. if it has no single head), then we will mark up the entire expression within the TimeML tag.

     > *All 75 people were* **on board** *at 9:00 a.m.*

- If the event is expressed by means of a prepositional phrase (PP), we will also use the strategy based on the headedness of the prepositional phrase. Therefore, the following example, where the PP is exocentric, will be tagged as shown:

  > All 75 people **on board** the Aeroflot Airbus died.

- Causative predicates raise issues as to whether the event signaled by the causative is genuinely distinct from the event which may be the causative's logical subject. For example, in

  > The rains caused the flooding.

  is the *cause* event distinct from the *rains* event, and should they be tagged as such?

  Three cases can be distinguished:

  Case 1 EVENT cause EVENT

  > The [**rains**] [**caused**] the [**flooding**].

  Case 2 ENTITY cause EVENT

  > John [**caused**] the [**fire**].

  Case 3 EVENT. Discourse marker EVENT

  > He [**kicked**] the ball, and it [**rose**] into the air.

  For now, we adopt the following solution for causatives predicates in TimeML.

  1. If the annotator encounters a predicate denoting a causative relation between arguments in a sentence, then, either:
     (a) If the (logical) subject is an event denoting expression (e.g., *war, flood, rain, meeting*, etc.), then mark it as an event, or: (CASE 1 ABOVE)
     (b) If the (logical) subject is an individual entity (e.g., *John, the woman, the company*, etc.), then do nothing with it. (CASE 2 ABOVE)
  2. Mark the object event as an event (*flooding, fire*).
  3. Mark the predicate denoting the causative relation as an event (*caused*).

4. If there is an event introduced by the subject, as in Case 1, then introduce a `TLINK` with a `relType` attribute of `IDENTITY` identifying the causative relation event with the subject event (see section 3 for a discussion of the `TLINK` tag and its attributes).

5. Introduce a `TLINK` between the causative predicate event and the event associated with the object position, with `relType` of `BEFORE`.

This solution should be adopted for verbs such as the following, in their causative senses: *cause, stem from, lead to, breed, engender, hatch, induce, occasion, produce, bring about, produce, secure.*

For CASE 3 above, the annotator has the option of identifying the discourse marker *and* as a signal (see section 2.3) for a `TLINK` introducing `relType BEFORE`, or not. The annotator CAN identify the `TLINK` between the events, but NEED NOT.

Fully annotated versions of the above examples are presented in section **??**.

What NOT to tag

- Generics will be not be tagged, at least for now, even though capturing them could be of use in question answering.

For example, the event words in the following sentences will not be tagged:

> <u>Use</u> of corporate jets for political <u>travel</u> is legal.
> Businesses are <u>emerging</u> on the Internet so quickly that no one, including <u>government</u> regulators, can <u>keep</u> track of them.
> Jews are prohibited from <u>killing</u> one another.

Here a property is ascribed to each of a class of events, or a relation is asserted between a class of events and members of a set of entities, but no single event instance, or set of event instances, in this class is positioned in time, or in relation to other temporally located events.

Standing between examples such as the preceding pure generics and others which express a single event, clearly positioned in time, and hence clearly taggable, such as

> On June 7, Mr. Sununu **used** a jet **provided** by Fiber Materials Inc.

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are less clear cut cases such as

> *Mr. Sununu has resorted to regular use of corporate planes for political travel.*

Such sentences express typical patterns of activity, but do not explicitly refer to specific events. For now such examples will **not** be tagged.

- Subordinating verbs which express events which are clearly temporally located, but whose complements are generics should themselves not be tagged. For example, a tensed reporting verb which attributes a generic should not be tagged:

  > *The rabbi said Jews are prohibited from killing one another.*

  In this case as the subordinated proposition is not tagged, the matrix verb *said* will also not be tagged.

- An event nominalisation that provides no information beyond that supplied by the verb to which it is bound need not be tagged. For example:

  > *Newspaper reports have* **said** *...*

  In this context *said* is tagged as an event, and *reports* is not tagged.

2.1.2 BNF for the EVENT tag

```
attributes ::= eid class
eid ::= e<integer>
class ::= 'REPORTING' | 'PERCEPTION' | 'ASPECTUAL' | 'I_ACTION' | 'I_STATE' |
          'STATE' | 'OCCURRENCE'
```

2.1.3 Attributes for EVENT

a. Event ID number (eid)   Non-optional attribute. Each event has to be identified by a unique ID number. This will be automatically assigned by the annotation tool every time an EVENT tag is assigned to some string.

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b. Class   Non-optional attribute. Each event belongs to one of the following classes. Note that while the examples show verbs expressing an event of a given type, it does not follow that every occurrence of the verb in question necessarily expresses an event of the same type. I.e. verbs may be ambiguous with respect to event class.

- REPORTING:

  Reporting events describe the action of a person or an organization declaring something, narrating an event, informing about an event, etc. Some examples: *say, report, tell, explain, state*:

  > *Punongbayan* **said** *that the 4,795-foot-high volcano was spewing gases up to 1,800 degrees.*
  > *No injuries were* **reported** *over the weekend.*
  > **Citing** *an example, ...*

- PERCEPTION:

  This class includes events involving the physical perception of another event. Such events are typically expressed by verbs like: *see, watch, glimpse, behold, view, hear, listen, overhear.*

  > *Witnesses tell Birmingham police they* **saw** *a man running.*
  > *"You can* **hear** *the thousands of small explosions down there",*
  > *a witness said.*

- ASPECTUAL:

  In languages such as English and French, there is a grammatical device of aspectual predication, which focuses on different facets of event history:

  1. Initiation: *begin, start, commence, set out, set about, lead off, originate, initiate.*
  2. Reinitiation: *restart, reinitiate, reignite* (metaphorically)
  3. Termination: *stop, cancel* (see also I_ACTION class), *end, halt, terminate, cease, discontinue, interrupt, quit, give up, abandon, block, break off, lay off, call off, wind up.*
  4. Culmination: *finish, complete.*
  5. Continuation: *continue, keep, go on, proceed, go along, carry on, uphold, bear on, persist, persevere.*

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A couple of examples:

> *The volcano* **began** *showing signs of activity in April for the first time in 600 years,...*
> *All non-essential personnel should* **begin** *evacuating the sprawling base.*

Here, a member of a closed class of predicates is able to select a verbal or nominal complement as an argument and mark that event with the function (designation) associated with one of the facets above. See section 3 for the annotation of the relation between the two events.

- I_ACTION:

  An I_ACTION is an Intensional Action. An I_ACTION **introduces an event argument** (which must be in the text explicitly) describing an action or situation **from which we can infer something given its relation with the I_ACTION**. For instance, the events introduced as arguments of the I_ACTIONS in (1) have not necessarily occurred when the I_ACTION takes place. Explicit performative predicates (like those in 5-9, below) are also included here. Note that the I_ACTION class does not cover states (see the description of I_STATES below).

  The following list, where I_ACTIONs are in bold face and the events they introduce are underlined, is representative (not exhaustive) of the types of events included in this class:

  1. **attempt, try, scramble:**

     > *Companies such as Microsoft or a combined worldcom MCI are* **trying** *to* <u>monopolize</u> *Internet access.*
     > *Israel has been* **scrambling** *to* <u>buy</u> *more masks abroad.*

  2. **investigate, investigation, look at, delve:**

     > *The Organization of African Unity will* **investigate** *the Hutu-organized* <u>genocide</u> *of more than 500,000 minority Tutsis.*
     > *A new Essex County task force began* **delving** *Thursday into the* <u>slayings</u> *of 14 black women.*

  3. **delay, postpone, defer, hinder, set back:**

     > *Israel will ask the United States to* **delay** *a military* <u>strike</u> *against Iraq.*

4. **avoid, prevent, cancel:**

   > *Palestinian police* **prevented** *a planned pro-Iraq* <u>*rally*</u> *by the Palestinian Professionals' Union.*

5. **ask, order, persuade, request, beg, command, urge, authorize:**

   > *Iraqi military authorities* **ordered** *all Americans and Britons in Kuwait to* <u>*assemble*</u> *at a hotel.*
   > *They were* **asked** *to* <u>*take*</u> *along important papers.*

6. **promise, offer, assure, propose, agree, decide:**

   > *Germany has* **agreed** *to* <u>*lend*</u> *Israel 180,000 protective kits against chemical and biological weapons, and Switzerland* **offered** *to* <u>*lend*</u> *Israel another 25,000 masks.*

7. **swear, vow.**

8. **name, nominate, appoint, declare, proclaim.**

9. **claim, allege, suggest.**

- **I_STATE:**

  I_STATE events are similar to the previous class. This class includes **states that refer to alternative or possible worlds**, (delimited by square brackets in the examples below), which can be introduced by subordinated clauses (1-2), nominalizations (3), or untensed VPs (4):

  1. *Russia now* **feels** *[the US must hold off at least until UN secretary general Kofi Annan visits Baghdad].*

  2. *Once they get that extinguished, they* **hope** *that [residents will begin returning to their homes].*

  3. *"There is no reason why we would not be* **prepared** *for [an attack"].*

  4. *The agencies fear they will be* **unable** *[to crack those codes to eavesdrop on spies and crooks].*

  As above, the following list of I_STATEs is just representative, not exhaustive:

  1. **believe, think, suspect, imagine, doubt, feel, be conceivable, be sure:**

*"We **believe** that [his words cannot distract the world from the facts of Iraqi aggression]."*

*Analysts also **suspect** [suppliers have fallen victim to their own success].*

*Russia now **feels** [the US must hold off at least until UN secretary general Kofi Annan visits Baghdad].*

*It is **conceivable** that [a larger eruption will take place in few hours].*

*He said he was **sure** that [a larger eruption would happen].*

2. **want, love, like, desire, crave, lust**:

> *"They don't **want** [to play with us]," one U.S. crew chief said.*
>
> *We aim at triggering associations that will generate **lust** for [change].*
>
> *An occupation Israel would **love** [to end], but ...*

Note that *love* as in *John loves Paul's cousin* is NOT considered an I_STATE. Similarly for *like*. An I_STATE must govern another event.

3. **hope, expect, aspire, plan**:

> *"We're **expecting** [a major eruption]," he said in a telephone interview early today.*
>
> *Once they get that extinguished, they **hope** that [residents will begin returning to their homes].*
>
> *We **aim** at [triggering associations that will generate lust for change].*

4. **fear, hate, dread, worry, be afraid**:

> *The agencies **fear** [they will be unable to crack those codes to eavesdrop on spies and crooks].*
>
> *They were **afraid** [to stay].*

5. **need, require, demand**

6. **be ready, be eager, be prepared**

> *The young industry's rapid growth also is attracting regulators **eager** [to police its many facets].*
>
> *"There is no reason why we would not be **prepared** for [an attack]".*

7. **be able, be unable**

   The agencies fear they will be **unable** *[to crack those codes to eavesdrop on spies and crooks].*

All I_STATEs will be annotated, whether they are persistent or not throughout the text being marked-up (see next class).

- STATE:

  States describe *circumstances* in which something obtains or holds true. However, we will only annotate:

  1. States that are identifiably changed over the course of the document being marked up.

     For instance, in the first example below, in the expression *the Aeroflot Airbus* the relationship indicating that the Airbus is run and operated by Aeroflot is not a STATE in the desired sense. Rather, because it is persistent throughout the event line of the document, we factor it out and it is not marked up. On the other hand, properties that are known to change during the events represented/reported in an article will be marked as STATEs.

     In these and the following examples the markable state is in bold face.

       All 75 people **on board** *the Aeroflot Airbus died.*
       Israel has been scrambling to buy more masks abroad, after a **shortage** *of several hundred thousand gas masks, including those for young children, was discovered.*
       No **injuries** *were reported over the weekend.*

  2. States that are directly related to a temporal expression.

     This criterion includes all states that are linked to a `TIMEX3` markable by means of a `TLINK`. Two examples are given here, where the state is in bold face and the temporal expression associated with it is underlined.

       James Pustejovsky was **CTO** *for several years.*
       They **lived** *in U.N.-run refugee camps for 2 1/2 years.*

  3. States that are introduced by an I_ACTION, an I_STATE, or a REPORTING event.

     States are in bold face, the introducing event underlined.

       He mediated the **crisis***.*
       Saddam Hussein sought **peace** *on another front.*
       Har-Shefi told police that Rabin was a **traitor***.*

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4. Predicative states the validity of which is dependent on the document creation time

In spite of not being explicitly related to any `TIMEX3` expression, the states introduced by *are* in the following examples will be tagged given that their validity is relative to the point in time they have been asserted (the DCT).

> *A total of about 3,000 Americans, 3,000 Britons and more than 450 Japanese* **are** *in Iraq and Kuwait.*
> *Overall, more than 2 million foreigners* **are** *in both countries.*

This will also include some quantitative statements such as those that appear in financial journals:

> *Gas prices fell from a* **twenty-two dollar barrel level** *down to the* **fourteen dollars** *we're seeing today.*

This will however apply only to predicative states. Sortal states (like *President, CTO*, etc.) won't be marked up.

Note that the current class, STATE, will not contain states that have been tagged as I_STATEs.

- OCCURRENCE:

This class includes all the many other kinds of events describing something that happens or occurs in the world. Some examples are given as illustration:

> *The Defense Ministry said 16 planes have* **landed** *so far with protective equipment against biological and chemical warfare.*
> *Mordechai said all the gas masks from abroad would* **arrive** *soon and be* **distributed** *to the public, adding that additional distribution centers would be* **set** *up next week.*
> *Two moderate* **eruptions** *shortly before 3 p.m. Sunday appeared to* **signal** *a larger* **explosion**.

Some examples from financial journals:

> *RMS said it* **had** *a* **loss** *of $158,666, or 10 cents a share, in the third quarter, compared with a year-earlier* **loss** *of $29,956, or two cents a share.*

> *Ralston said its restructuring* **costs include** *the* **phase-out**
> *of a battery facility in Greenville, N.C....*
> *Its cereal division* **realized** *higher operating* **profit** *on vol-*
> *ume* **increases***, but also* **spent** *more on* **promotion***.*

2.2 The tag <TIMEX3>

Since the details of the tag set that TimeML uses to annotate temporal expressions differ in detail both from the TIMEX tag in STAG (Sheffield Temporal Annotation Guidelines – see [**?**]) and the TIMEX2 tag in TIDES, we here use the tag name TIMEX3 for temporal expressions. See I&P(02) for further details.

2.2.1 How to annotate TIMEX3s

In order to be as compliant as possible with TIDES TIMEX2 annotation, the `TIMEX3` tag will, for the most part, be applied to TIMEX2 markable expressions. See TIDES(02), section 2, for the particular expressions we intend to cover.

However, TimeML will differ from TIDES in the following ways (the examples given below are adapted from TIDES(02)):

1. **TIMEX2 attributes that will be used:** (related to TIDES(02), sections 3.2 to 3.6)

   TimeML will only take TIDES attributes **VAL** and **MOD** as appropriate for `TIMEX3` elements (TIDES(02), sections 3.2 to 3.4). None of the following features will be directly considered: SET, PERIODICITY, GRANULARITY, NON_SPECIFIC (explained in TIDES(02), sections 3.5 and 3.6). The information that TIDES conveys by means of the first three attributes will be expressed here using features added to TIMEX3 during the TANGO workshop.

2. **Extent of the time expression to tag** (issue covered in TIDES(02), section 4). The tag extent for `TIMEX3` will be very similar to that proposed in TIMEX2. We follow the schema of TIDES(02), section 4, very closely in order to make the difference clear.

   (a) **Appositives:**
   The treatment will be exactly as in TIDES (section 4.2.1).

   (b) **Range Expressions:**
   Again, same treatment as in TIDES, section 4.2.2.

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(c) **Conjoined Expressions:**

Our treatment here will be similar to the one proposed in TIDES (section 4.2.3) in that the conjunction (or disjunction) will delimit two different `TIMEX3` expressions. However, it will differ from TIDES in that the longest time expression sequences may need to be split into smaller `TIMEX3` expressions.

For instance, in *Saddam might play the whole game again six months or a year from now*, the temporal expression *six months* needs to refer to *(from) now* in order to be correctly evaluated. Therefore, *from now* can't be considered part of the temporal expression *a year*.

(d) **Embedded Expressions:**

TIDES establishes different treatments for embedded expressions (TIDES(02), section 4.2.4). In some cases, a single tag is created. In others, there is the possibility of embedding TIMEX2 tags. This is however not necessary in TimeML, given a more general conception of temporal anchoring. The treatment of embedded expressions in TimeML is as shown below:

  i. **ONE single TIMEX3 tag** will be assigned to expressions like those in TIDES(02), section 4.2.4.1 (*When to Create One Tag*). The TimeML annotator should refer to that section for details on such expressions.

  For instance, the scope for the `TIMEX3` tag in the expression *twelve o'clock midnight* or *eleven in the morning* encompasses the full extent of the temporal expression.

  Some other examples are:

  > *Friday evening*
  > *Tuesday the 18th*
  > *twelve o'clock January 3, 1984*
  > *the second of December*
  > *October of 1963*
  > *summer of 1964*

  ii. **TWO TIMEX3 tags**, with no nesting of tags inside one another, will be assigned to most of the expressions referred to in section 4.2.4.2 of TIDES(02).

     A. Sequences of two temporal expressions that are ordered one relative to the other. They generally involve the use of temporal prepositions and conjunctions like *from, before, after, following, prior to*, etc. Such words will be

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annotated as signals and links will be used to express the relative ordering of the two temporal expressions – see sections 2.3 and 3, respectively. In addition, these types of expression are considered **anchored durations** and can be annotated as such in the newest version of TimeML – see subsection 2.2.3.

I'm leaving on vacation **two weeks from next Tuesday**.

```
<TIMEX3 tid="t1">
two weeks
</TIMEX3
from
<TIMEX3  tid="t2">
next Tuesday
</TIMEX3>
```

John left **2 days before yesterday.**.

```
<TIMEX3 tid="t1">
2 days
</TIMEX3>
before
<TIMEX3 tid="t2">
yesterday.
</TIMEX3>
```

A major earthquake struck Los Angeles **three years ago today**.

```
<TIMEX3 tid="t1">
three years
</TIMEX3>
ago
<TIMEX3 tid="t2">
today
</TIMEX3>
```

The annotator is strongly encouraged to check the complete annotation of the examples above in section 4.

B. While possessive constructions were included in this section of TIDES(02), they are not anchored durations. As

such, they can be annotated with **ONE** `TIMEX3` **tag** if
both the possessive phrase and the phrase that it modifies
are temporal expressions.

> **This year's summer** *was unusually hot.*

```
<TIMEX3 tid="t1">
This year's summer
</TIMEX3>
```

iii. **TWO TIMEX3 tags related by a TLINK tag** will be
applied to handle cases other than those described above.
In the following examples, the scope of each `TIMEX3` tag is
signaled by square brackets.

> *I tutored an English student some* [*Thursdays*]*in* [*1998*].
> *The concert is at* [*8:00 p.m.*] *on* [*Friday*].
> *The concert is*[*Friday*] *at* [*8:00 p.m.*]

The difference between temporal expressions like the one in
the third example (*Friday at 8:00 p.m.*) and some others in
2(d)i above, that are handled by means of a single `TIMEX3`
tag (like *Friday evening*) is the presence of the signal **at** in
the former case. Except for the cases introduced in 2(d)ii
above, SIGNAL-markable elements will be used as delimiters
of `TIMEX3` tags.

(e) **Temporal expressions containing postmodifiers**
TimeML also differs from TIDES(02) regarding the extent of
temporal expressions containing **postmodifiers (prepositional
phrases and dependent clauses) that introduce a related
event**. So, contrary to TIDES(02), in the following examples the
postmodifiers in brackets are **not** part of the temporal expres-
sion. A complete annotation of these examples, containing the
links between the time expression and the event, is provided in
section 4.

> *five days after he came back*

```
<TIMEX3 tid="t1">
five days
</TIMEX3>
after he
<EVENT eid="e1" class="OCCURRENCE">
came
```

```
</EVENT>
back
```

nearly four decades of experience

```
<TIMEX3 tid="t1">
nearly four decades
</TIMEX3>
of
<EVENT eid="e2" class="STATE">
experience
</EVENT>
```

months of renewed hostility

```
<TIMEX3 tid="t1">
months
</TIMEX3>
of renewed
<EVENT eid="e2" class="STATE">
hostility
</EVENT>
```

the future of our people

```
<TIMEX3 tid="t1">
the future
</TIMEX3>
of our people.
```

It is worth noticing the difference between the cases here and those in **??** above, where the postmodifier introduces a temporal expression, and not an event.

Adverbial postmodifiers will be considered part of the TIMEX3 markable expression:

*the best second quarter **ever***

```
<TIMEX3 tid="t1">
the best second quarter ever
</TIMEX3>
```

*three years **ago***

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```
<TIMEX3 tid="t1">
three years ago
</TIMEX3>
```

3. **Empty Content** `TIMEX3s`. One of the newer features of TimeML allows for `TIMEX3` tags that do not consume text but instead represent a temporal expression that is implicit in the text. These occur most often when an event instance takes place at a time suggested by the text, but that is not explicit in it. The presence of **anchored durations** often motivate the need for an empty content `TIMEX3`. If warranted by the document, the annotator can create an empty `TIMEX3` to represent a duration that is implied by a range of temporal expressions or to make explicit the begin or end point of a duration. Examples of this phenomena can be found in section **??**.

2.2.2 BNF for the TIMEX3 tag

```
attributes ::= tid type [functionInDocument][beginPoint][endPoint][quant][freq]
[temporalFunction] (value | valueFromFunction) [mod][anchorTimeID]
tid ::= ID
{tid ::= TimeID
TimeID ::= t<integer>}
type ::= 'DATE' | 'TIME' | 'DURATION' | 'SET'
beginPoint ::= IDREF
{beginPoint ::= TimeID}
endPoint ::= IDREF
{endPoint ::= TimeID}
quant ::= CDATA
freq ::= CDATA
functionInDocument ::= 'CREATION_TIME' | 'EXPIRATION_TIME' |
 'MODIFICATION_TIME' | 'PUBLICATION_TIME' |
 'RELEASE_TIME'| 'RECEPTION_TIME' | 'NONE'
 {default, if absent, is 'NONE'}
temporalFunction ::= 'true' | 'false' {default, if absent, is 'false'}
{temporalFunction ::= boolean}
value ::= CDATA
{value ::= duration | dateTime | time | date | gYearMonth |
 gYear | gMonthDay | gDay | gMonth}
valueFromFunction ::= IDREF
{valueFromFunction ::= TemporalFunctionID
```

```
TemporalFunctionID ::= tf<integer>}
mod ::= 'BEFORE' | 'AFTER' | 'ON_OR_BEFORE' | 'ON_OR_AFTER' |
 'LESS_THAN' | 'MORE_THAN' | 'EQUAL_OR_LESS' |
 'EQUAL_OR_MORE' | 'START' | 'MID' | 'END' | 'APPROX'
anchorTimeID ::= IDREF
{anchorTimeID ::= TimeID}
```

2.2.3 Attributes for TIMEX3

a. Timex ID number (tid) Non-optional attribute. Each `TIMEX3` expression has to be identified by a unique ID number. This is automatically assigned by the annotation tool.

b.   Type Non-optional attribute. Each `TIMEX3` is assigned one of the following types: `DATE`, `TIME`, `DURATION`, or `SET`. The format of the `value` attribute is determined by the `type` of `TIMEX3`. For instance, a `DURATION` must have a `value` that begins with the letter 'P' since durations represent a period of time. This will be elaborated on below in the `value` section. In addition, some optional attributes are used specifically with certain types of temporal expressions.

The following examples illustrate each possible `type` value. In them, the `TIMEX3` markable expression is in bold face:

- `DATE`: The expression describes a calendar time.

  > *Mr. Smith left* **Friday, October 1, 1999**
  > **the second of December**
  > **yesterday**
  > *in* **October of 1963**
  > *in* **the summer of 1964**
  > *on* **Tuesday 18th**
  > *in* **November 1943**
  > **this year's summer**
  > **two weeks from next Tuesday**
  > **last week**

  `DATE` can also be the value for the `type` attribute of each of the two `TIMEX3` markable expressions constituting a range. E.g.,

  > *John left between* **Monday** *and* **Wednesday**

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```
John left between
<TIMEX3 tid="t1" type="DATE">
Monday
</TIMEX3>
and
<TIMEX3 tid="t2" type="DATE">
Wednesday
</TIMEX3>
```

See section 4 for a fully annotated version of the same example.

- **TIME**: The expression refers to a time of the day, even if in a very indefinite way (as in the two last examples below):

  Mr. Smith left **ten minutes to three**
            at **five to eight**
            at **twenty after twelve**
            at **half past noon**
            at **eleven in the morning**
            at **9 a.m. Friday, October 1, 1999**
            the morning of January 31
            late last night
            last night

  As before, **TIME** can also be the `type` value for each of two **TIMEX3** markable expressions that together refer to a temporal range (e.g., *Mr. Smith left between* **8:00 a.m.** *and* **10:00 a.m.**).

- **DURATION**: The expression describes a duration. This value is assigned only to explicit durations like the following:

  Mr. Smith stayed **2 months**   *in Boston*
                   48 hours
                   three weeks
                   all last night
                   20 days *in July*
                   3 hours *last Monday.*

  As a rule, if any specific calendar information is supplied in the temporal expression, then the `type` of the **TIMEX3** must be either **DATE** or

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`TIME`. Some annotators may be tempted to make something like "1985" a `DURATION` if the context suggests that an event holds throughout that year. However, since it is required that a `DURATION` have a particular format in the `value` attribute, such a temporal expression as the one described here must be a `DATE`.

- `SET`: The expression describes a set of times. This value is assigned to expressions such as those in section 3.5 of TIDES(02). For example:

  > *John swims* **twice a week**.
  > **every 2 days**.

c. Value The attribute `value` (equivalent to `VAL` in TIMEX2) will be annotated exactly as specified in TIDES(02) sections 3.2.and 3.3. Note however that these sections also include the use of two additional attributes, `ANCHOR_VAL` and `ANCHOR_DIR`, which are not used in TimeML.

With the assistance of the annotation tool, the annotator will introduce as much information as is available both in the time expression and from the context. The following examples, from previous sections, partially illustrate the use of the `value` attribute for times of the day, dates, durations, and sets:

- Times of the day, and dates:

```
<TIMEX3 tid="t1" type="TIME" value="T24:00">
twelve o'clock midnight
</TIMEX3>
```

  In case the text would include some reference to the specific date in which the time is anchored (e.g., *Last Friday's party didn't start till twelve o'clock midnight*, assuming that today is Friday, July 12, 2002), then the `value` attribute must also contain the date, and be: `value="2002-07-05T24:00"`.

```
<TIMEX3 tid="t2" type="TIME" value="T11">
eleven in the morning
</TIMEX3>
```

  The same comment as above applies here.

```
<TIMEX3 tid="t3" type="TIME" value="2001-01-12TEV">
Friday evening
</TIMEX3>
```

The value in the above example assumes that we know that the document creation time is Tuesday, January 8th, 2001.

```
<TIMEX3 tid="t4" type="TIME" value="1984-01-03T12:00">
twelve o'clock January 3, 1984
</TIMEX3>
```

We assume here that noon is intended.

```
<TIMEX3 tid="t5" type="DATE" value="XXXX-12-02">
the second of December
</TIMEX3>
```

Unless we know the year to which the text is anchoring the current temporal expression, the 'value' attribute will leave the year underspecified by means of placeholders: XXXX.

```
<TIMEX3 tid="t6" type="DATE" value="1964-SU">
summer of 1964
</TIMEX3>
```

```
He left between
<TIMEX3 tid="t1" type="TIME" value="T18:00">
6:00 p.m.
</TIMEX3>
and
<TIMEX3 tid="t1" type="TIME" value="T20:00">
8:00 p.m.
</TIMEX3>
```

In the previous and the following examples, the duration of the range will be conveyed by means of a pair of TLINKs linking the event with both its time or date of initiation, and its time or date of ending. In some cases, an empty tag can also be created to explicitly represent the duration that is implied by the range.

```
We'll be on a break from
<TIMEX3 tid="t1" type="DATE" value="XXXX-07-01">
July, 1
</TIMEX3>
to
<TIMEX3 tid="t1" type="DATE" value="XXXX-08-15">
August, 15
</TIMEX3>
```

- Durations:

```
<TIMEX3 tid="t1" type="DURATION" value="P4M">
4 months
</TIMEX3>


for
<TIMEX3 tid="t1" type="DURATION" value="PT20M">
20 minutes
</TIMEX3>
<TIMEX3 tid="t2" type="DATE" value="XXXX-07-08">
last Monday
</TIMEX3>


during
<TIMEX3 tid="t1" type="DURATION" value="P2D">
two entire days
</TIMEX3>
on
<TIMEX3 tid="t2" type="DATE" value="1999-SU">
the summer of 1999
</TIMEX3>
```

- Sets:

  To fully annotate sets, the TIMEX3 must also include either the quant
  or freq attributes, if not both. The following examples begin the
  annotation of a TIMEX3 set as pertains to the value attribute:

```
<TIMEX3 tid="t1" type="SET" value="P1W">
```

```
twice a week
</TIMEX3>


<TIMEX3 tid="t1" type="SET" value="P2D">
every 2 days
</TIMEX3>


<TIMEX3 tid="t1" type="SET" value="P1W">
3 days each week
</TIMEX3>


<TIMEX3 tid="t1" type="SET" value="XXXX-10">
every October
</TIMEX>
```

Notice that in the last example, the value looks more like that of a `DATE` than a `DURATION`. This is so we can capture the calendar information that is present in the temporal expression. Some annotators may find it confusing as to when a DATE-like annotation is used and when a DURATION-like format is preferred. In general, if there is no specified calendar date (for example, "October" or "Tuesday"), then the value for the `SET` will be like that of a `DURATION`.

d. mod   Optional attribute, inherited directly from the TIMEX2 MOD attribute. Its value is as specified in TIDES(02), section 3.4.

e. temporalFunction   Binary attribute which expresses that the value of the temporal expression needs to be determined via evaluation of a temporal function. Temporal functions will be applied as a postprocess within the T3PO (TIMEX3 Parser Objects) module.

The value for this attribute will be positive for those cases that do not contain all the information necessary to fill the higher-order (left-hand) positions in the date value. Some examples are:

eleven in the morning

January, 31

late last night

last week

Note that even if the `value` attribute has been completely filled because the context provides the necessary information, the `temporalFunction` attribute should still receive a positive value so that the pertinent temporal function in T3PO can be tested to see if it can reproduce the value that the human annotator has assigned.

On the other hand, for cases in which the higher-order position of the value are filled `temporalFunction` should be assigned a negative value. Such cases include:

> *twelve o'clock January 3, 1984*
>
> *summer of 1964*
>
> *Friday, October 1, 1999*
>
> *9 a.m. Friday, October 1, 1999*
>
> *the morning of January 31, 1999*

Durations will receive `true` as the value of the `temporalFunction` attribute, in the case of underspecification. Examples of expressions that will be assigned `true` for this attribute are the following, where the scope of the `TIMEX3` tag is in bold face:

> *in* **recent months**

```
<TIMEX3 tid="t1" type="DURATION" value="PXM" temporalFunction="true">
```

> *during* **the following hours**

```
<TIMEX3 tid="t1" type="DURATION" value="PXH" temporalFunction="true">
```

On the other hand, expressions of durations that will be assigned `false` as value of the `temporalFunction` attribute are:

> for **two months**
>
> **48 hours**

By default, the value introduced in `temporalFunction` will be positive, given that specific expressions like those immediately above seem to appear rarely in the corpora.

f. anchorTimeID   Optional attribute. It introduces the ID of the **time expression** to which the `TIMEX3` markable is temporally anchored. Its value is then always a timeID. The relation between the event *left* and the time *Tuesday* in *He left on Tuesday* will be annotated by means of a `TLINK` (see section 3).

The temporal anchors that are annotatable are those outside the scope of the `TIMEX3` tag. Thus in the sequence *two weeks from next Tuesday*, *next Tuesday* is not going to be annotated as temporal anchor of *two weeks*. Instead, the temporal anchor for the whole `TIMEX3`-marked expression will be that relative to which the date for *next Tuesday* can be evaluated. Assume this corresponds to the date refered to by the timeID t0:

> *Mary will arrive two weeks from next Tuesday*

```
<TIMEX3 tid="t1" type="TIME" value="2002-08-06"
        temporalFunction="true" anchorTimeID="t0">
two weeks from next Tuesday
</TIMEX3>
```

Another example:

> *Mary left on Thursday and John arrived the day after.*

```
Mary left
on
<TIMEX3 tid="t1" type="DATE"
value="1998-WXX-4" temporalFunction="true"
anchorTimeID="t0">
Thursday
</TIMEX3>
and John arrived
<TIMEX3 tid="t2" type="DATE"
value="1998-WXX-5" temporalFunction="true"
anchorTimeID="t1">
the day
</TIMEX3>
after
```

In this previous case, both `TIMEX3` expressions require the application of a temporal function: *the day (after)* needs to be

evaluated with respect to *Thursday*, and *Thursday* relative to
another time reference, not explicit in the current example.

*The TERQAS Workshop will resume Monday, July 15. The
session will start at 9:00 a.m.*

```
The TERQAS Workshop will resume
<TIMEX3 tid="t1" type="DATE" value="2002-07-15">
Monday, July 15
</TIMEX3>
. The session will start at
<TIMEX3 tid="t2" type="TIME" value="T9:00"
temporalFunction="true" anchorTimeID="t1">
9:00 a.m.
</TIMEX3>
```

Note that the presence of the `anchorTimeID` attribute appears together
with `temporalAnchor='true'`. However, this is not always the case.

g. valueFromFunction This attribute is not relevant for the purposes
of manual annotation, but only for the T3PO postprocess. The human
annotator should ignore it.

h. functionInDocument This attribute indicates the function of a TIMEX3
in providing a temporal anchor for other temporal expressions in the docu-
ment. There are several times that mark the major milestones in the life of
a news resource:

- the time the story is created

- the time the story is modified

- the time the story is published

- the time it may be released (if not immediately)

- the time it is received by a customer

- the time that the story expires (if any)

The possible values for this attribute are then: 'CREATION_TIME', 'MODIFICATION_TIME',
'PUBLICATION_TIME', 'RELEASE_TIME', 'RECEPTION_TIME', 'EXPIRATION_TIME',
'NONE'.

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If this attribute is not explicitly supplied, the default value is 'NONE'.
The Document Creation Time will be annotated as:

```
<TIMEX3 tid="t1" type="DATE" functionInDocument="CREATION_TIME" value="1996-0327">
03-27-96
</TIMEX3>
```

The following attributes are used to strengthen the annotation of durations and sets in TimeML. Each is optional and can be used at the annotator's discretion. It is important to note, however, that beginPoint and endPoint should only be used when the type of the expression is duration, and that quant and freq should only be used when the expression is a set.

i. beginPoint and endPoint These attributes are used when a duration is anchored by another time expression. If only one of these points is provided in the text, the annotator can create an empty TIMEX3 to represent the missing point. In some ways, the beginPoint and endPoint attributes are similar to anchorTimeID. The values stored in these attributes can be used by temporal functions to compute the missing point and create a tag for it. The following example shows how this might occur:

```
John begins teaching
<TIMEX3 tid="t1" type="DURATION" value="P1W" beginPoint="t2" endPoint="t3">
one week
</TIMEX3>
from
<TIMEX3 tid="t2" type="DATE" value="XXXX-9-15">
September 15
</TIMEX3>
<TIMEX3 tid="t3" type="DATE" value="XXXX-9-22" temporalFunction="TRUE" anchorTimeID="
```

The new tid created by the empty TIMEX3 can be used to link the teaching event directly to the time at which it takes place. For more information on this, see section 3.

j. quant and freq These attributes are used when a temporal expression is of the type SET. quant is generally a literal from the text that quantifies over the expression. freq contains an integer value and a time granularity that represent the frequency at which the temporal expression regularly

reoccurs. These attributes are only used if their values are supplied by the
temporal expression (or by a temporal anchor). Though it seems on occasion
that values for these attributes can be inferred, they will not be for purposes
of manual annotation. Although, if there is no specified `quant`, one imagines
that the set is universally quantified. The following examples complete the
annotations of the sets listed earlier in this section:

```
<TIMEX3 tid="t1" type="SET" value="P1W" freq="2X">
twice a week
</TIMEX3>


<TIMEX3 tid="t1" type="SET" value="P2D" quant="EVERY">
every 2 days
</TIMEX3>


<TIMEX3 tid="t1" type="SET" value="P1W" quant="EACH" freq="3d">
3 days each week
</TIMEX3>


<TIMEX3 tid="t1" type="SET" value="XXXX-10" quant="EVERY">
every October
</TIMEX>
```

2.3   The tag `<SIGNAL>`

A signal is a textual element that makes explicit the relation holding between
two entities (timex and event, timex and timex, or event and event). Signals
are generally:

- **Temporal prepositions:** *on, in, at, from, to, before, after, during,*
  etc.

- **Temporal conjunctions:** *before, after, while, when,* etc.

- **Prepositions signaling modality:** *to.*

- **Special characters:** "-" and "/", in temporal expressions denoting
  ranges (*September 4-6, Apr. 1999/Jul. 1999,* etc.).

2.3.1 How to annotate SIGNALs

Temporal Prepositions, Conjunctions and Modifiers These functional words will be tagged as illustrated in the following simple examples:

```
John taught <SIGNAL sid="s1"> on </SIGNAL> Monday

All passengers died <SIGNAL sid="s1"> when </SIGNAL>
the plane crashed into the mountain.
```

When two distinct signals appear side by side, they can be annotated separately, if they belong to different signal classes as listed above. However, some situations require that they must be annotated as a single SIGNAL. For example:

```
They will investigate the role of the US
 <SIGNAL sid="s1">before, during and after</SIGNAL> the genocide
```

In this case, the three temporal prepositions need to be collapsed into a single SIGNAL in order to properly recover the IS_INCLUDED relation of the `TLINK` between the *genocide* and the *role* events (see section 3).

2.3.2 BNF for the SIGNAL tag

```
attributes ::= sid
sid ::= s<integer>
```

2.3.3 Attributes for SIGNAL

SIGNAL has only one, non-optional, attribute: `sid`, the signal's unique id. It is automatically assigned by the annotation tool each time a SIGNAL is marked up.

2.4 The tag `<MAKEINSTANCE>`

We distinguish between event **tokens** and event **instances** or realisations – `MAKEINSTANCE` creates the actual realisation of an event. The motivation is examples like *John taught on Monday and Tuesday*, where one verb represents two events. In order to be able to annotate such cases, it is necessary to create two **instances** of *taught*, representing the two different events. The tense, aspect, morphology (for non-tensed forms), polarity, and modality of a particular event instance are also represented in this tag. As such, a

sentence such as *John taught today but he might not tomorrow* can be adequately represented. MAKEINSTANCEs are created **in addition** to the event annotation (which marks up the event token).

In most cases, only one MAKEINSTANCE is needed, and will be automatically created by the annotation tool, so the annotator only has to insert **additional** MAKEINSTANCE for the second (and further, if necessary) instance or realisation of an event.[1] There are also cases, where the annotator can either create as many MAKEINSTANCEs as motivated by the text or one MAKEINSTANCE which carries a cardinality value. Examples are the following:

1. *John taught twice on Monday.*

2. *John taught 150 times last year.*

In the first example, the annotator can either create two MAKEINSTANCEs or one MAKEINSTANCE with cardinality two. In the second example, the only practical solution is to create one MAKEINSTANCE with cardinality 150.

2.4.1   How to annotate MAKEINSTANCEs

We will use examples to demonstrate how to annotate MAKEINSTANCEs. In these examples we will not give a detailed annotation of events, times and signals, so please refer to the appropriate sections for instructions on how to annotate them. We also only show the mark-up for those entities which are relevant to the examples.

A MAKEINSTANCE has to be created for each instance or realisation of an event – as many as are motivated by the text. Alternatively, the cardinality attribute may be used, e.g. for *every* and for large numbers. When the cardinality is small enough (e.g. *twice*) , the annotator has a choice of creating one MAKEINSTANCE with the appropriate cardinality or creating as many MAKEINSTANCES as appropriate. We recommend using only one MAKEINSTANCE, unless individual events are referred to later in the text. Note that one MAKEINSTANCE will be automatically created for each event by the annotation tool, so the annotator only has to create additional MAKEINSTANCEs when more than one event instance is referred to in the text. This is done by annotating or 'swiping' the event as many times as needed. Each 'swipe' will automatically create a new instance ID.

---

[1]It may be necessary for the annotator to assign values for the negation and modality attributes in cases where the annotation tool was unable to do so. These values were represented with SIGNALs and SLINKs that were automatically generated, for the most part, in previous versions of the TimeML specification.

In each of the following examples the event *taught* is marked up as follows:

```
<EVENT eid="e1"> taught </EVENT>
```

1. *John taught on Monday*

   This leads to one automatically created `MAKEINSTANCE`:

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="NONE"
   nf_morph="NONE"/>
   ```

2. *John taught on Monday and Tuesday*

   Since the teaching event has two different time values in this example, two `MAKEINSTANCE`s are necessary. The first one will be automatically created, but the second one has to be created by the annotator:

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="NONE"
   nf_morph="NONE"/>
   <MAKEINSTANCE eiid="ei2" eventID="e1" tense="PAST" aspect="NONE"
   nf_morph="NONE"/>
   ```

3. *John taught twice on Monday*

   Since there is only one time expression in the text, the annotator has the choice of either creating a second `MAKEINSTANCE` or using the cardinality attribute. If two `MAKEINSTANCE` are created then they would look as follows (where *twice* is the signal with `signalID="s1"`):

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="NONE"
   nf_morph="NONE" signalID="s1"/>
   <MAKEINSTANCE eiid="ei2" eventID="e1" tense="PAST" aspect="NONE"
   nf_morph="NONE" signalID="s1"/>
   ```

   If one `MAKEINSTANCE` were created instead then it would look as follows:

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="NONE"
   nf_morph="NONE" signalID="s1" cardinality="2"/>
   ```

4. *John should have taught*

   This leads to one `MAKEINSTANCE` that includes the modality attribute:

```
<MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="PERFECTIVE"
nf_morph="NONE" modality="SHOULD"/>
```

5. *John did not teach*

   This leads to one `MAKEINSTANCE` with the negation attribute:

```
<MAKEINSTANCE eiid="ei1" eventID="e1" tense="PRESENT" aspect="NONE"
nf_morph="NONE" negation="true"/>
```

2.4.2   BNF for the MAKEINSTANCE tag

```
attributes ::= eiid eventID tense aspect nf_morph [polarity] [modality]
[signalID] [cardinality]
eiid ::= ID
{eiid ::= EventInstanceID
EventInstanceID ::= ei<integer>}
eventID ::= IDREF
{eventID ::= EventID}
tense ::= 'PAST' | 'PRESENT' | 'FUTURE' | 'NONE'
aspect ::= 'PROGRESSIVE' | 'PERFECTIVE' | 'PERFECTIVE_PROGRESSIVE' |
 'NONE'
nf_morph ::= 'ADJECTIVE' | 'NOUN' | 'PRESPART' | 'PASTPART' | 'INFINITIVE' |
 'NONE'
polarity ::= 'NEG' | 'POS' {default, if absent, is 'POS'}
modality ::= CDATA
signalID ::= IDREF
{signalID ::= SignalID}
cardinality ::= CDATA
```

2.4.3   Attributes for MAKEINSTANCE

a. Event Instance ID number (eiid)   Non-optional attribute. Each
event instance has to be identified by a unique ID number. This will be au-
tomatically assigned by the annotation tool every time a MAKEINSTANCE
tag is created.

b. Event ID number (eventID)   Non-optional attribute. Each event
instance is related to a specific EVENT found in the text. This will be auto-
matically assigned by the annotation tool every time a MAKEINSTANCE
tag is created.

c. Tense, Aspect, Non-finite Morphology (tense, aspect, nf_morph)
Non-optional attributes. These attributes will be introduced during prepro-
cessing, but the human annotator will have to correct them and add them
when necessary. Following are some guidelines for choosing `tense`, `aspect`,
and `nf_morph`. The `tense` and `aspect` attribute captures standard distinc-
tions among the grammatical categories of verbal phrases. The **tense** at-
tribute can have values `PRESENT`, `PAST`, `FUTURE`, or `NONE`. The **aspect** at-
tribute can have values `PROGRESSIVE`, `PERFECTIVE`, `PERFECTIVE_PROGRE-`
`SSIVE`, or `NONE`. The **nf_morph** attribute captures distinctions among the
grammatical categories of phrases which are marked as events, but do not
contain tensed verbs, or verbs marked by a modal form. This attribute
can have the following values: `ADJECTIVE`, `NOUN`, `PRESPART`, `PASTPART`,
`INFINITIVE`, `NONE`.

- **Finite Verbs:**

  All finite verbs will have **nf_morph = "NONE"**. **tense** and **aspect**
  attributes will be established as indicated in the following examples:

  - **Active Voice**

    tense="PRESENT"

Verb group	aspect=
teaches	NONE
is teaching	PROGRESSIVE
has taught	PERFECTIVE
has been teaching	PERFECTIVE_PROGRESSIVE

    tense="PAST"

Verb group	aspect=
taught	NONE
was teaching	PROGRESSIVE
had taught	PERFECTIVE
had been teaching	PERFECTIVE_PROGRESSIVE

    tense="FUTURE"

Verb group	aspect=
will teach	NONE
is going to teach	NONE
will be teaching	PROGRESSIVE
is going to be teaching	PROGRESSIVE
will have taught	PERFECTIVE
will have been teaching	PERFECTIVE_PROGRESSIVE

  - **Passive Voice**

tense=“PRESENT”

Verb group	aspect=
is taught	NONE
is being taught	PROGRESSIVE
has been taught	PERFECTIVE

tense=“PAST”

Verb group	aspect=
was taught	NONE
was being taught	PROGRESSIVE
had been taught	PERFECTIVE

tense=“FUTURE”

Verb group	aspect=
will be taught	NONE
is going to be taught	NONE
will have been taught	PERFECTIVE

- **Verbs preceeded by a modal auxiliar**

  Two different cases are contemplated here:

  - **Verbs preceeded by the modal auxiliar:** *have to*

    The characterization of `nf_morph,` `tense`, and `aspect` will be very similar to finite verbs: **nf_morph = “NONE”**. **tense** and **aspect** follow the following examples:

    tense=“PRESENT”

Verb group	aspect=
has to teach	NONE
has to be teaching	PROGRESSIVE
has to have taught	PERFECTIVE
has to have been teaching	PERFECTIVE_PROGRESSIVE

    tense=“PAST”

Verb group	aspect=
had to teach	NONE
had to be teaching	PROGRESSIVE

    tense=“FUTURE”

Verb group	aspect=
will have to teach	NONE
will have to be teaching	PROGRESSIVE

– **Verbs preceeded by any other modal auxiliar**

Modal auxiliars in this group include: *must, may, might, can, could, should,* and *would.* In this case, the attributes in MAKEINSTANCE will be **tense=“NONE”** and **nf_morph =“NONE”**. The value for **aspect** will be assigned according the following examples:

tense=“NONE”

Verb group	aspect=
could teach	NONE
could be teaching	PROGRESSIVE
could have taught	PERFECTIVE
could have been teaching	PERFECTIVE_PROGRESSIVE

- **Non-finite Verbs**

A range of subordinate clauses in English contain non-finite verbs. These include infinitive and participial clauses. Some examples are given below.

Present Participle: (“PRESPART”)

King Hussein arrived in Washington yesterday **seeking** *to gain support for a new initiative.*

Past Participle: (“PASPART”)

Steel plates **found** *at the scene are being examined by experts.*

Infinitive: (“INFINITIVE”)

Callahan plans to **release** *the information today.*

In all these cases, **tense=“NONE”**. The differences will be encoded in the **nf_morph**, which will receive the following values: **PRESPART, PASTPART** and **INFINITIVE**.

If **nf_morph** is set up to **INFINITIVE**, the **aspect** attribute can recieve any of its possible values:

nf_morph=“INFINITIVE”

Verb group	aspect=
(to) release	NONE

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(to) be releasing	PROGRESSIVE
(to) have released	PERFECTIVE
(to) have been releasing	PERFECTIVE_PROGRESSIVE

On the other hand, if **nf_morph** is set up to**PRESPART** or **PAST-PART**, the aspect attribute will be set up to **aspect="NONE"**.

nf_morph="PRESPART"

Verb group	**aspect=**
seeking	NONE

nf_morph="PASTPART"

Verb group	**aspect=**
found	NONE

Note that verbs in the past participle forms can also be used as part of passive or perfective constructions. The also have uses (described below) in which they should be marked as adjectives. The `PASTPART` marking is intended for those cases in which the participle occurs in a subordinate clause, but should also be used when it cannot be clearly determined to be in either of the other categories.

A similar rule applies for verbs in the present participle, which occur in progressive constructions (described above), but also have both noun and adjective uses (described below). The `PRESPART` marking is intended for those cases in which the participle occurs in a subordinate clause, but should also be used when it cannot be clearly determined to be a progressive, an adjective, or a noun.

- **Adjectives**

When a stative adjective is marked as an event (see the section on `EVENT`s for guidelines on determining whether an adjective is markable), the nf_morph attribute of its associated `MAKEINSTANCE` must have the value set up as **nf_morph="ADJECTIVE"**.

Tense and **aspect** for adjectives will have the `NONE` value, except when being the head of the predicative complement of the copular verb *to be*. In this case, the `tense` and `aspect` attributes will present the values

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corresponding to the tense and the aspect of the copular verb.[2] The following examples illustrate the distinction:

tense="NONE"

Example	**aspect="NONE"**
The suspect, **unwilling** *to talk, ...*	

tense="PRESENT"

Examples	**aspect=**
The spouse <u>is</u> **unwilling** *to talk.*	NONE
has spouse <u>is being</u> **unwilling** *to talk.*	PROGRESSIVE
has spouse <u>has been</u> **unwilling** *to talk.*	PERFECTIVE

tense="PAST"

Examples	**aspect=**
The spouse <u>was</u> **unwilling** *to talk.*	NONE
has spouse <u>was being</u> **unwilling** *to talk.*	PROGRESSIVE
has spouse <u>had been</u> **unwilling** *to talk.*	PERFECTIVE

tense="FUTURE"

Examples	**aspect=**
The spouse <u>will be</u> **happy** *to talk.*	NONE
The spouse <u>will have been</u> **happy** *to talk*	PERFECTIVE

ADJECTIVE vs. PASTPART   It can be difficult to distinguish adjectives from non-finite past participles or from passives. An important clue is that if a form is followed by a *by*-phrase, it is not an adjective. The following tests are evidence that a form is an adjective. Apply them to the sentence in which the questionable form occurs:

– Gradeability: Can the form be preceded by a degree adverb?

He was very *surprised*.

He was more *surprised* than she was.

– *-un*: For verbs that do not have an *-un* form, is there a corresponding *-un* adjective?

He remains *unconcerned* about the risk.

NOT ADJECTIVE: The door was *unlocked* by the guard.

---

[2]Recall that copular verbs are not tagged as events in TimeML, but their predicative complement instead.

– Predicative position: Does the form occur in a construction with one of the following verbs, and could the verb be replaced by one of the others?

>*be*
>
>*become*
>
>*feel*
>
>*look*
>
>*remain*
>
>*seem*
>
>*sound*

ADJECTIVE vs. PRESPART   It is also difficult to distinguish adjectives from non-finite present participles or progressives. The tests for adjective-hood listed above apply here, as well. In addition, most present participles which precede nouns should be marked as adjectives:

>an *appealing* face
>
>the *waiting* limo
>
>*existing* rules

An exception to this rule are cases when the semantics of the construction suggests that the present participle is being used as a noun:

>the *waiting* room

In this case, the present participle refers to an abstract activity–waiting–and thus should not be marked as an event. This contrasts with the example above, in which waiting is predicated of the limo. Other examples in which an -*ing* form preceding a noun is an abstract noun and should thus not be marked as an event:

>*knitting* needle
>
>*shooting* match
>
>*drinking* problem

- **Nominals**

  When a nominal is marked as an event (see the section on EVENTs above to determine whether a nominal is markable), the `nf_morph` attribute of its associated `MAKEINSTANCE` must be set up to **nf_morph="NOUN"**.

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As with adjectives, **tense** and **aspect** for nouns will have the `NONE` value, except when being the head of the predicative complement of the verb *to be*. In this case, the `tense` and `aspect` attributes will present the values corresponding to the tense and the aspect of the copular verb.

tense=**"NONE"**	
Example	aspect=**"NONE"**
The **threat** *caused considerable attention.*	

tense=**"PRESENT"**	
Examples	aspect=
This <u>is</u> an **attempt** *to open negotiations.*	NONE
This <u>is being</u> a **nuisance***.*	PROGRESSIVE
This <u>has been</u> a **concern** *for many months.*	PERFECTIVE

tense=**"PAST"**	
Examples	aspect=
That <u>was</u> an **attempt** *to open negotiations.*	NONE
That <u>was being</u> a **nuisance***.*	PROGRESSIVE
That <u>had been</u> a **concern** *for many months.*	PERFECTIVE

tense=**"FUTURE"**	
Examples	aspect=
This <u>will be</u> an **attempt** *to open negotiations.*	NONE
This <u>will have been</u> an **attempt** *to open negotiations.*	PERFECTIVE

NOUN vs. PRESPART   Gerunds will be marked as NOUNs. The following tests are evidence that a form is a NOUN. Again, see the section on `EVENT`s to determine which nominals are actually markable. These tests should be applied to the entire sentence in which the form occurs:

– plurals: Could the form be plural?

    Thousands marched to protest the *killings* of ethnic Albanians by . . .

– Adjectival modification: Could the form be modified by an adjective?

    Careful *driving* prevented the accident.

- Direct object in *of*: Is the direct object of the verb expressed in an *of*-phrase?

    Bob's (repeated) *slamming* of the door annoyed Emma.

- Preceded by noun: Is the form preceded by a noun?

    plant *closing*

The following tests are evidence that a form is a present participle:

- Adverbial modification: Could the form be modified by an adverb?

    Bob prevented the accident by *driving* carefully.

- Direct object in NP: Is the direct object of the verb expressed in a simple NP?

    Bob's (repeatedly) *slamming* the door annoyed Emma.

d. Polarity and Modality (negation, modality) Optional attributes. The polarity of an event instance is represented by the boolean attribute, negation. If it is set to 'TRUE', the event instance is negated. If it is set to 'FALSE' or not present in the annotation, the event instance is not negated. The modality attribute is only present if there is a modal word present that modifies the instance. Pre-processing should take care of assigning these attributes, but the human annotator may need to correct them or add them.

e. Cardinality and Signal ID (cardinality, signalID) Optional attributes. Cardinality is only present if there is a signal that provides its value. A signal is also present if multiple instances of an event are created by the human annotator. With the addition of sets to the latest specification of TimeML, these attributes will be used less often – see section 2.2.

3   The link tags: `<TLINK>`, `<SLINK>`, and `<ALINK>`

There are three types of link tags. The function of each will be introduced here, before we move on to explaining in detail how links are annotated. Please note that TimeML `EVENT`s never participate in a link. Instead, their corresponding event instance IDs are used. In the explanations below, however, the words "events" and "event instances" are used interchangeably.

3.1   The tag <TLINK>

A `TLINK` or Temporal Link represents the temporal relationship holding between events, times, or between an event and a time. Note that `EVENT`s participate in a `TLINK` by means of their corresponding event instance IDs. In the present explanation, however, the words "events" and "event instances" are used interchangeably. This same observation applies also for `SLINK`s and `ALINK`s, which will be introduced in sections 3.2 and 3.3, respectively.

A `TLINK` establishes a link between the involved entities making explicit if they are:

1. **Simultaneous**

   Two event instances are judged simultaneous if they happen at the same time, or are temporally indistinguishable in context, i.e. occur close enough to the same time that further distinguishing their times makes no difference to the temporal interpretation of the text.

2. One **before** the other:

   As in the following example between the events *slayings* and *arrested*:

   > The police looked into the **slayings** *of 14 women. In six of the cases suspects have already been* **arrested**.

3. One **after** the other:

   This is just the inverse of the preceding relation. So the two events of the previous example can alternatively be annotated as expressing an **after** relation, if the directionality is changed.

4. One **immediately before** the other:

   As in the following sentence between *crash* and *died*.

   > *All passengers* **died** *when the plane* **crashed** *into the mountain*

5. One **immediately after** than the other:

   This is the inverse of the preceding relation.

6. One **including** the other:

   As is the case between the temporal expression and the event in the following example:

> *John* **arrived** *in Boston* **last Thursday**.

7. One **being included** in the other:

   The inverse relation to the preceding one.

8. One holds **during** the other:

   Specifically applicable to states or events that persist throughout a duration, for example:

   > *James was* **CTO** *for* **two years**.
   > *John* **taught** *for* **20 minutes** *on Monday.*

9. One being the **beginning** of the other:

   As holds between the first of the temporal expressions and the event in the following example:

   > *John was* **in the gym** *between* **6:00 p.m.** *and 7:00 p.m.*

10. One being **begun by** the other:

    The inverse relation to the one just introduced.

11. One being the **ending** of the other:

    > *John was* **in the gym** *between 6:00 p.m. and* **7:00 p.m.**.

12. One being **ended by** the other:

    The inverse relation to the one just introduced.

    In addition, `TLINK`s are also used in the following situations:

13. Event **identity**

    Event identity is also annotated via the `TLINK`. **Note that event identity is a very important relationship, which will not be picked up during the closure part of the annotation. So please make sure that all identity links are annotated.** E.g.:

    > *John* **drove** *to Boston. During his* **drive** *he ate a donut.*

14. When a **'set/subset' relationship** occurs in the text.

    An example is:

*The police looked into the **slayings** of 14 women. In six of*
*the **cases** suspects have already been arrested.*

With the current version of TimeML we cannot capture this 'set/subset'
relationship. What will be done for now is to create a `MAKEINSTANCE`
for each of the 'sets', i.e. one `MAKEINSTANCE` for *slayings* with cardinal-
ity plural (or 14?) and one `MAKEINSTANCE` for *cases* with cardinality
plural (or 6?) and then link these two instances via a `TLINK` with the
temporal relationship IS_INCLUDED or INCLUDES.

Fully annotated versions of examples like these above can be found in
sections 4.1 and 4.2.

3.1.1 How to annotate TLINKs

Here and in the following sections for `SLINKs` and `ALINKs`, we use examples
to demonstrate how to create each of the link types. In these examples we
do not give detailed annotation of events, times and signals – please refer to
the appropriate section for instructions on annotating these. Also, we only
show the mark-up for those entities which are relevant to the examples.

A `TLINK` has to be created each time a temporal relationship holding
between events or an event and a time needs to be annotated. This includes
the important relationship of event identity.[3] Examples:

1. *John taught on Monday*

   The temporal relationship holding between the event and the time
   expression, as indicated by the signal *on*, is marked up by introducing
   the following `TLINK`:

   ```
   <TLINK eventInstanceID="ei1" relatedToTime="t1" signalID="s1"
           relType="IS_INCLUDED"/>
   ```

2. *John taught on Monday and Tuesday*

   As explained in section 2.4 above, two `MAKEINSTANCE`s represent the
   two instances of *taught*:

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e5"/>
   <MAKEINSTANCE eiid="ei2" eventID="e5"/>
   ```

---

[3]Remember that an **event ID** is *never* used in a link. Instead, the **event instance
ID** is used in all cases (i.e. the ID used in the `MAKEINSTANCE`).

The temporal relationship holding between those two events and the two time expressions are annotated by introducing the following two TLINKs:

```
<TLINK eventInstanceID="ei1" relatedToTime="t1" signalID="s1"
       relType="IS_INCLUDED"/>

<TLINK eventInstanceID="ei1" relatedToTime="t2" signalID="s1"
       relType="IS_INCLUDED"/>
```

3. *John taught every Monday*

   The TIMEX3 representing the multiple instances of *Monday* looks as follows:

   ```
   <TIMEX3 tid="t1" type="SET" value="XXXX-WXX-1" quant="EVERY">
   every Monday
   </TIMEX3>
   ```

   The TLINK representing the temporal relation holding between the event and the temporal expression looks like this:

   ```
   <TLINK eventInstanceID="ei9" relatedToTime="t1"
     relType="IS_INCLUDED"/>
   ```

4. *John taught for 20 minutes on Monday.*

   The MAKEINSTANCE representing the event *taught* looks as follows:

   ```
   <MAKEINSTANCE eiid="ei4" eventID="e4"/>
   ```

   Two TLINKs have to be introduced[4]. One TLINK captures the fact that the *taught* event holds throughout the *20 minutes*, and one TLINK captures the fact that the *20 minutes* temporal expression is included in *Monday*.

---

[4]As is often the case, these are not the only TLINKs that can be drawn from this text. However, post-processing algorithms should be able to fill in the links the annotator leaves out.

```
<TLINK eventInstanceID="ei4" relatedToTime="t2" signalID="s5"
       relType="DURING"/>

<TLINK tid="t2" relatedToTime="t3" signalID="s6"
    relType="IS_INCLUDED"/>
```

5. *John drove to Boston. During his drive he ate a donut.*

   The MAKEINSTANCEs presenting the events *drove* and *drive* look as follows:

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e1"/>

   <MAKEINSTANCE eiid="ei2" eventID="e2"/>
   ```

   The TLINK that has to be introduced to represent the identity of these two events looks as follows:

   ```
   <TLINK eventInstanceID="ei1" relatedToEvent="ei2" relType="IDENTITY"/>
   ```

   Please note that we did not include the TLINK that would represent the temporal relationship between *ate* and *drive*.

6. *The police looked into the slayings of 14 women. In six of the cases suspects have already been arrested.*

   The MAKEINSTANCEs representing the events *slayings* and *cases* look as follows:

   ```
   <MAKEINSTANCE eiid="ei1" eventID="e1" cardinality="14"/>

   <MAKEINSTANCE eiid="ei2" eventID="e2" cardinality="6">
   ```

   The TLINK that has to be introduced to represent the relationship between these two events looks as follows:

   ```
   <TLINK eventInstanceID="ei1" relatedToEvent="ei2" relType="INCLUDES"/>
   ```

3.1.2 BNF for the TLINK tag

```
attributes ::= [lid] [origin] (eventInstanceID | timeID) [signalID]
               (relatedToEventInstance | relatedToTime) relType
lid ::= ID
{lid ::= LinkID
LinkID ::= l<integer>}
origin ::= CDATA
eventInstanceID ::= IDREF
{eventInstanceID ::= EventInstanceID}
timeID ::= IDREF
{timeID ::= TimeID}
signalID ::= IDREF
{signalID ::= SignalID}
relatedToEventInstance ::= IDREF
{relatedToEventInstance ::= EventInstanceID}
relatedToTime ::= IDREF
{relatedToTime ::= TimeID}
relType ::= 'BEFORE' | 'AFTER' | 'INCLUDES' | 'IS_INCLUDED' | DURING
            |'SIMULTANEOUS' | 'IAFTER' | 'IBEFORE' | 'IDENTITY'
            | 'BEGINS' | 'ENDS' | 'BEGUN_BY' | 'ENDED_BY'
```

3.1.3 Attributes for TLINKs

1. **eventInstanceID** or **timeID**

   Obligatory attribute (one or the other of these needs to be present).
   This is the ID of the `eventInstance` or the `timeID` involved in the
   temporal link.

2. **signalID**

   Optional attribute. If the temporal relation holding between the enti-
   ties is explicitly signaled in the text, then the ID of that signal needs
   to be supplied here.

3. **relatedToEventInstance** or **relatedToTime**

   Obligatory attribute (one or the other of these needs to be present).
   This is the ID of the entity that is being related to the event instance
   with `ID=eventInstanceID` or time expression with `ID=timeID`.

4. **relType**

Obligatory attribute. This is the temporal relation holding between the entities. Possible values are: BEFORE, AFTER, INCLUDES, IS_INCLUDED, DURING, SIMULTANEOUS, IAFTER, IBEFORE, IDENTITY, BEGINS, ENDS, BEGUN_BY, ENDED_BY . These are assigned according to the instructions given at the beginning of section 3.1, on TLINKs. There will be only one relation assigned per TLINK.

3.2   The tag <SLINK>

An SLINK or Subordination Link is used for contexts introducing relations between two events.[5]. SLINKs are of one of the following sorts:

- **Modal:**

  This relation is brought up by events introducing a reference to a possible world – mainly I_ACTIONs and I_STATEs:

  > *John* **promised** *Mary to <u>buy</u> some beer.*
  > *Mary* **wanted** *John to <u>buy</u> some wine.*

- **Factive:**

  Certain verbs introduce an entailment (or presupposition) of their argument's veracity. They include **forget** (with a tensed complement), **regret**, or **manage**:

  > *John* **forgot** *that he was <u>in Boston</u> last year.*
  > *Mary* **regrets** *that she didn't <u>marry</u> John.*
  > *John* **managed** *to <u>leave</u> the party*

- **Counter-factive:**

  Contrary to the previous relation, in this case the event introduces a presupposition about the non-veracity of its argument: **forget (to)**, **unable to** (in past tense), **prevent, cancel, avoid, decline**, etc.

  > *John* **forgot** *to <u>buy</u> some wine.*
  > *Mary was* **unable** *to <u>marry</u> John.*
  > *John* **prevented** *the <u>divorce</u>.*

---

[5]Previous versions of TimeML allowed for SLINKs holding between an event and a signal in order to represent polarity and modality, but this information is now represented in the MAKEINSTANCE tag – see subsection 2.4.3.

- **Evidential:**

  Evidential relations are typically introduced by `REPORTING` or `PERCEPTION` events:

  > *John* **said** *he* <u>*bought*</u> *some wine.*
  > *Mary* **saw** *John* <u>*carrying*</u> *only beer.*

- **Negative evidential:**

  Introduced by `REPORTING` and `PERCEPTION` events conveying negative polarity:

  > *John* **denied** *he* <u>*bought*</u> *only beer.*

`SLINKs` can be of the following nature:

1. **Lexically-based:**

   They are triggered by an event of class `I_ACTION`, `I_STATE`, `PERCEPTION`, or `REPORTING`, which are events that generally take a clausal complement or an NP headed by an event-denoting nominal. The `SLINK` is established between those events and the one denoted by the complement.

   For each `REPORTING` or `PERCEPTION` event, an `SLINK` has to be introduced. In the following example, the `REPORTING` and `PERCEPTION` events are in bold face, whereas the subordinated events are underlined:

   > *15 minutes later I* **saw** *the other plane just* <u>*slam*</u> *into the Worl Trade Center.*
   > *"It* <u>*sounded*</u> *like a jet or rocket,"* **said** *Eddie Gonzalez.*

   Similarly, for each `I_ACTION` or `I_STATE` an `SLINK` is introduced, which expresses the relation between the intensional event (in bold face) and its subordinated event (underlined):

   > *Subcomandante Marcos* **attempted** *to* <u>*explain*</u> *this difference in a letter in 1995.*
   > *We* **want** *to* <u>*participate*</u> *directly in the decisions which concern us, to* <u>*control*</u> *those who govern us.*

The subordinating event class constrains the `SLINK` relation type in the following way:

    i. `PERCEPTION` events:
      They will always introduce `SLINKS` of type `EVIDENTIAL` or `NEG_EVIDENTIAL`.

    ii. `I_ACTION, I_STATE` events:
      They can introduce `SLINKs` of type `MODAL`, `FACTIVE`, and `COUNTER_FACTIVE`.

   iii. `REPORTING` events:
      They can introduce `SLINKs` of any type.

2. **Structurally-based:**

   (a) **Purpose Clauses:**
      In a sentence involving a purpose clause, an `SLINK` relates the event in the main clause (bold face) and the one in the purpose clause modifying it (underlined).

        The environmental commission must **adopt** *regulations to <u>ensure</u> people are not exposed to radioactive waste.*

   (b) **Conditional contructions:**
      In a conditional construction, an `SLINK` relates the event in the antecedent clause and the one in the consequent clause.

        On Dec. 2 Marcos promised to **return** *to the negotiating table if the conflict zone was <u>demilitarized</u>.*

3.2.1   How to annotate SLINKs

1. **Lexically-based SLINKS:**

The annotator should put an `SLINK` relating the subordinating event to each event that is subordinated by it:

- *John said that he taught on Monday.*
  To express the fact that the *taught* event is reported by the *said* event, the following `SLINK` is created:

  ```
  <SLINK eventInstanceID="ei2" subordinatedEventInstance="ei3"
    relType="EVIDENTIAL"/>
  ```

- *John denied that he taught on Monday.*
  To express the fact that the *taught* event is being reported by the *denied* event, the following `SLINK` is created:

```
<SLINK eventInstanceID="ei1" subordinatedEventInstance="ei2"
relType="NEG_EVIDENTIAL"/>
```

In some cases the same subordinating event will introduce more than one `SLINK`. For instance, in the example below the event *said* is slink-ed to two events: *listed* and *gave*.

- *Rita* **said** *they correctly <u>listed</u> his name but <u>gave</u> a false address for him.*

```
<SLINK eventInstanceID="ei1" subordinatedEventInstance="ei2"
relType="EVIDENTIAL"/>
<SLINK eventInstanceID="ei1" subordinatedEventInstance="ei3"
relType="EVIDENTIAL"/>
```

2. **Structurally-based SLINKS:**

    (a) **Purpose Clauses:**
    The event in the main clause will correspond to the value of the attribute `eventInstanceID`. The event in the purpose clause will be taken as the `subordinatedEvent` value. These SLINKs will always receive `relType="MODAL"`. The preposition *to* will be taken as the value of the `signalID` attribute.

    - *The environmental commission must* **adopt** *regulations to <u>ensure</u> people are not exposed to radioactive waste.*
      ```
      <SLINK eventInstanceID="ei1" subordinatedEventInstance="ei2"
      signalID="s1" relType="MODAL"/>
      ```

    (b) **Conditional contructions:**
    The event in the antecedent clause corresponds to the value in the `eventInstanceID` attribute. The one in the consequent, to the value of the `subordinatedEvent`. The conditional conjunction (*if, when*) will be taken as the value of the `signalID` attribute. These SLINKs will always receive `relType="CONDITIONAL"`.

    - *Mexico pledged to* **support** *an inquiry into Guantanamo if it is <u>put</u> to the vote at the UN Human Rights Commission.*
      ```
      <SLINK eventInstanceID="ei1" subordinatedEventInstance="ei2"
      signalID="s1" relType="CONDITIONAL"/>
      ```

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The presence of the same event in several SLINKS is also possible in structurally-based SLINKs, as for instance in the following conditional construction, where the antecent is a coordination. In this case, the repeated event is the subordinated one (*return*), since it is the event in the consequent clause.

- *On Dec. 2 Marcos promised to* **return** *to the negotiating table if the conflict zone was <u>demilitarized</u>, Congress <u>passed</u> a bill on indigenous rights and culture, and around 100 Zapatista prisoners were <u>released</u>.*

  ```
  <SLINK eventInstanceID="ei2" subordinatedEventInstance="ei1"
  signalID="s1" relType="CONDITIONAL"/>


  <SLINK eventInstanceID="ei3" subordinatedEventInstance="ei1"
  signalID="s1" relType="CONDITIONAL"/>


  <SLINK eventInstanceID="ei4" subordinatedEventInstance="ei1"
  signalID="s1" relType="CONDITIONAL"/>
  ```

3.2.2 BNF for the SLINK tag

```
attributes ::= [lid] [origin] [eventInstanceID]
               [signalID] subordinatedEventInstance relType
lid ::= ID
{lid ::= LinkID
LinkID ::= l<integer>}
origin ::= CDATA
eventInstanceID ::= IDREF
{eventInstanceID ::= EventInstanceID}
subordinatedEventInstance ::= IDREF
{subordinatedEventInstance ::= EventInstanceID}
signalID ::= IDREF
{signalID ::= SignalID}
relType ::= 'MODAL' | 'EVIDENTIAL' | 'NEG_EVIDENTIAL'
            | 'FACTIVE' | 'COUNTER_FACTIVE' | 'CONDITIONAL'
```

3.2.3 Attributes for SLINKs

1. **eventInstanceID**

Optional attribute. This is the ID of the `eventInstance` involved in the subordination link. **Note:** `eventInstanceID` is optional because an event can be subordinated (e.g. in a conditional) without being subordinated to a particular event.

2. **subordinatedEventInstance**

    Obligatory attribute (one of them needs to be present). This is the ID of the subordinated event instance that the event instance with `ID=eventInstanceID` is related to.

3. **signalID**

    Optional attribute. If the subordination relation holding between the events is explicitly signalled in the text, then the ID of that signal needs to be filled in here.

4. **relType**

    Obligatory attribute. This is the temporal relation holding between the entities. Possible values are: `MODAL, EVIDENTIAL, NEG_EVIDENTIAL, FACTIVE, COUNTER_FACTIVE, CONDITIONAL`. These are assigned according to the instructions given at the beginning of section 3.2, on `SLINKs`.

3.3 The tag `<ALINK>`

An `ALINK` or Aspectual Link represents the relationship between an aspectual event and its argument event. Examples of the aspectual relations to be encoded are:

1. **Initiation**:

    John **started** *to read*

2. **Culmination**:

    John **finished** *assembling* *the table.*

3. **Termination**:

    John **stopped** *talking.*

4. **Continuation**:

    John **kept** *talking.*

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3.3.1 How to annotate ALINKs

ALINKS represent the relationship between aspectual verbs (and other expressions) and the event they refer to. Examples are:

1. *John started to read*

   The two MAKEINSTANCEs for the two events are the following:

   ```
   <MAKEINSTANCE eiid="ei5" eventID="e2"/>
   <MAKEINSTANCE eiid="ei6" eventID="e3"/>
   ```

   The ALINK that has to be created between the aspectual verb *started* and the event *read* is the following:

   ```
   <ALINK eventInstanceID="ei5" relatedToEventInstance="ei6"
     relType="INITIATES"/>
   ```

2. *John finished reading*

   The two MAKEINSTANCEs for the two events are the following:

   ```
   <MAKEINSTANCE eiid="ei5" eventID="e2"/>
   ```

   ```
   <MAKEINSTANCE eiid="ei6" eventID="e3"/>
   ```

   The ALINK that has to be created between the aspectual verb started and the event teach is the following:

   ```
   <ALINK eventInstanceID="ei5" relatedToEventInstance="ei6"
     relType="TERMINATES"/>
   ```

3.3.2 BNF for the ALINK tag

```
attributes ::= [lid] [origin] eventInstanceID [signalID]
               relatedToEventInstance relType
lid ::= ID
{lid ::= LinkID
LinkID ::= l<integer>}
origin ::= CDATA
eventInstanceID ::= ID
```

```
{eventInstanceID ::= EventInstanceID}
signalID ::= IDREF
{signalID ::= SignalID}
relatedToEventInstance ::= IDREF
{relatedToEventInstance ::= EventInstanceID}
relType ::= 'INITIATES' | 'CULMINATES' | 'TERMINATES'
              | 'CONTINUES' | 'REINITIATES'
```

3.3.3 Attributes for ALINKs

1. **eventInstanceID**

   Obligatory attribute. This is the ID of the (aspectual) eventInstance involved in the aspectual link.

2. **signalID**

   Optional attribute. If the aspectual relation holding between the events is explicitly signalled in the text, then the ID of that signal needs to be filled in here. An example for a signal is *to* in *The ship began to sink*.

3. **relatedToEventInstance**

   Obligatory attribute. This is the ID of the event instance related to the aspectual event.

4. **relType**

   Obligatory attribute. This is the temporal relation holding between the entities. Possible values are: `INITIATES`, `CULMINATES`, `TERMINATES`, `CONTINUES`, `REINITIATES`

3.3.4 Additional attributes for all LINK tags

Link ID and Origin The `lid` and `origin` attributes are optional in all TimeML links. They are used solely for post-processing efforts such as closure and can be ignored by the human annotator.

4 Completely annotated examples

Assume for all the examples that the document creation time (DCT) is marked up as a `TIMEX3` expression with `tid="t0"`.

4.1 Complex TIMEX Examples

1. *John left 2 days before yesterday.*

```
John
<EVENT  eid="e1" class="OCCURRENCE" >
left
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="PERFECTIVE"/>
<TIMEX3 tid="t1" type="DURATION" value="P2D" beginPoint="t2" endPoint="t3">
2 days
</TIMEX3>
<SIGNAL sid="s1">
before
</SIGNAL>
<TIMEX3 tid="t2" type="DATE" value="2002-07-10" temporalFunction="true"
anchorTimeID="t0">
yesterday
</TIMEX3>

<TIMEX3 tid="t3" type="DATE" value="2002-07-08" temporalFuntion="true"
anchorTimeID="t1"/>

<TLINK timeID="t1" relatedToTime="t2" signalID="s1" relType="BEFORE"/>
<TLINK eventInstanceID="ei1" relatedToTime="t3" relType="IS_INCLUDED"/>
```

The TIMEX3 that is annotated as a DURATION includes begin and end-point information. The annotator also could have included additional TLINKs with this information.

The type attribute of the TIMEX3 for "yesterday" denotes a DATE, which can be computed by a temporal function relative to the temporal anchor "t0" (the DCT). Similarly, the final TIMEX3 can be computed by a temporal function relative to the initial DURATION, annotated as "t1".

2. *I'm leaving on vacation two weeks from next Tuesday.*

```
I'm
<EVENT  eid="e1" class="OCCURRENCE">
leaving
```

```
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1" tense="FUTURE" aspect="PROGRESSIVE"/>
on vacation
<TIMEX3 tid="t1" type="DURATION" value="P2W" beginPoint="t2" endPoint="t3">
two weeks
</TIMEX3>
<SIGNAL sid="s1">
from
</SIGNAL>
<TIMEX3 tid="t2" type="DATE" value="2002-07-02" temporalFunction="true"
anchorTimeID="t0">
next Tuesday
</TIMEX3>

<TIMEX3 tid="t3" type="DATE" value="2002-07-23" temporalFunction="true"
anchorTimeID="t1"/>

<TLINK timeID="t1" relatedToTime="t2" signalID="s1" relType="AFTER"/>
<TLINK eventInstanceID="ei1" relatedToTime="t3" relType="IS_INCLUDED"/>
```

3. *A major earthquake struck Los Angeles three years ago today.*

```
A major
<EVENT  eid="e1" class="OCCURRENCE" >
earthquake
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1" tense="NONE" aspect="NONE" nf_morph="NOUN"
<EVENT  eid="e2" class="OCCURRENCE" >
struck
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2" tense="PAST" aspect="PERFECTIVE"/>
Los Angeles
<TIMEX3 tid="t1" type="DURATION" value="P3Y" beginPoint="t2" endPoint="t3">
three years ago
</TIMEX3>
<TIMEX3 tid="t2" type="DATE" value="2002-07-12" temporalFunction="true"
anchorTimeID="t0">
today
</TIMEX3>
```

```
<TIMEX3 tid="t3" type="DATE" value="1999-07-12" temporalFunction="true"
anchorTimeID="t1"/>


<TLINK eventInstanceID="ei1" relatedToEvent="ei2" relType="IBEFORE"/>
<TLINK eventInstanceID="ei1" relatedToTime="t3" relType="IS_INCLUDED"/>
```

4. *John left 2 days ago.*

```
John
<EVENT  eid="e1" class="OCCURRENCE">
left
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1" tense="PAST" aspect="PERFECTIVE"/>
<TIMEX3 tid="t1" type="DATE" value="2002-07-08"
    temporalFunction="true" anchorTimeID="t0">
2 days ago.
</TIMEX3>


<TLINK  eventInstanceID="ei1" relatedToTime="t1" relType="IS_INCLUDED"/>
```

Note that *ago* is NOT a signal but a part of the TIMEX3 expression.

The TIMEX3 expression returns a DATE (not a DURATION), which needs to be computed by a temporal function relative to the DCT or the Speech time. *2 days ago* is ALWAYS a DATE computed relative to the DCT, in contrast to expressions like "2 days before", which necessarily relate two events and thus introduce a TLINK with the magnitude attribute. This can be observed in the 3 following examples.

5. *John left 2 days before the attack.*

```
John
<EVENT  eid="e1" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
left
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
<TIMEX3 tid="t1" type="DURATION" value="P2D" temporalFunction="false">
2 days
</TIMEX3>
```

```
<SIGNAL sid="s1">
before
</SIGNAL>
the
<EVENT  eid="e2" class="OCCURRENCE" tense="NONE" aspect="NONE">
attack
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2"/>

<TLINK  eventInstanceID="ei1" signalID="s1" relatedToEvent="ei2"
relType="BEFORE" magnitude="t1"/>
```

6. *5 days after he came back Mary got sick.*

```
<TIMEX3 tid="t1" type="DURATION" value="P5D" temporalFunction="false">
5 days
</TIMEX3>
<SIGNAL sid="s1">
after
</SIGNAL>
he
<EVENT  eid="e1" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
came
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
back Mary
<EVENT  eid="e2" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
got
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2"/>
sick.

<TLINK  eventInstanceID="ei1" signalID="s1" relatedToEvent="ei2"
relType="BEFORE" magnitude="t1"/>
```

7. *Two months before the attack, a report was sent.*

```
<TIMEX3 tid="t1" type="DURATION" value="P2M" temporalFunction="false">
```

```
Two months
</TIMEX3>
<SIGNAL sid="s1">
before
</SIGNAL>
the
<EVENT  eid="e1" class="OCCURRENCE"  tense="NONE" aspect="NONE">
attack
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
a report was
<EVENT  eid="e2" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
sent
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2"/>

<TLINK eventInstanceID="ei1" signalID="s1" relatedToEvent="ei2"
relType="AFTER" magnitude="t1"/>
```

The `TIMEX3` expression here is considered here to be of `type=DURATION`,
since it establishes the length of the interval separating the 2 events.
As such, the value for the `value` attribute is already known (`P2D`, `P5M`,
etc.) and therefore the `temporalFunction` attribute returns `false` as
its value.

There is only one `TLINK` relating the two events, which introduces
both the `magnitude` attribute (pointing to the ID of the TIMEX3
expression) and the `signalID` attribute.

4.2   Complex `TLINK` and `SLINK` Examples

1. *The attack was not expected at all, although a report had been sent 2
   months before.*

```
The
<EVENT eid="e1" class="OCCURRENCE" tense="NONE" aspect="NONE">
attack
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
was
```

```
<SIGNAL sid="s1">
not
</SIGNAL>
<EVENT eid="e2" class="I_STATE" tense="PAST" aspect="PERFECTIVE">
expected
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2"/>
at all, although a report had been
<EVENT eid=e3>
sent
</EVENT>
<MAKEINSTANCE eiid="ei3" eventID="e3"/>
<TIMEX3 tid="t1" type="DURATION" val="P2M" temporalFunction="false">
2 months
</TIMEX3>
<SIGNAL sid=s2>
before
</SIGNAL>

<SLINK eventInstanceID="ei2" signalID="s1" relType="NEGATIVE"/>
<SLINK eventInstanceID="ei2" subordinatedEvent="e1" relType="MODAL"/>
<TLINK eventInstanceID="ei1" relatedToEvent="ei3" relType="AFTER"
    magnitude="t1" signalID="s2"/>
```

2. *Mary arrived yesterday but John left 2 days before.*

```
Mary
<EVENT  eid="e1" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
arrived
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
<TIMEX3  tid="t1" type="DATE" value="2002-07-09"
    temporalFunction="true" anchorTimeID="t0"
    valueFromFunction="tf1">
yesterday
</TIMEX3>
but John
<EVENT  eid="e2" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
left
</EVENT>
```

```
<MAKEINSTANCE eiid="ei2" eventID="e2"/>
<TIMEX3 tid="t2" type="DURATION" value="P2D" temporalFunction="false">
2 days
</TIMEX3>
<SIGNAL sid="s1">
before.
</SIGNAL>

<TLINK  eventInstanceID="ei1" signalID="s1" relatedToEvent="ei2"
relType="AFTER" magnitude="t2"/>
<TLINK  eventInstanceID="ei1" relatedToTime="t1" relType="IS_INCLUDED"/>
```

The two events are related by means of a TLINK. In addition there is a
second TLINK relating the event linked to the date (*arrived*) and this
date (yesterday).

3. *She was sick after the play.*

```
She was
<EVENT eid="e1" class="STATE" tense="NONE" aspect="NONE">
sick
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
<SIGNAL sid="s1">
after
</SIGNAL>
the
<EVENT  eid="e2" class="OCCURRENCE"  tense="NONE" aspect="NONE">
play
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2"/>

<TLINK  eventInstanceID="ei1" signalID="s1" relatedToEvent="ei2"
relType="AFTER"/>
```

The TLINK does not introduce magnitude.

4. *She was sick for 2 hours after the play.*

```
She was
```

```
<EVENT eid="e1" class="STATE" tense="NONE" aspect="NONE">
sick
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
<SIGNAL sid="s1">
for
</SIGNAL>
<TIMEX3 tid="t1" type="DURATION" value="P2H" temporalFunction="false">
2 hours
</TIMEX3>
<SIGNAL sid="s2">
after
</SIGNAL>
the
<EVENT  eid="e2" class="OCCURRENCE"  tense="NONE" aspect="NONE">
play
</EVENT>
<MAKEINSTANCE eiid="ei2" eventID="e2"/>

<TLINK  eventInstanceID="ei1" signalID="s1" relatedToTime="t1"
relType="HOLDS"/>
<TLINK  eventInstanceID="ei1" signalID="s2" relatedToEvent="ei2"
relType="AFTER"/>
```

There are two TLINKs: The first one introduces the holding relation between the state of being sick and the time it took (2 hours). The second one states the ordering of the two events. Since there is no explicit reference to the duration of the interval between the two events, the second TLINK does not introduce the magnitude attribute.

5. *John taught for 20 minutes every Monday.*

   One EVENT, two TIMEX3s and two SIGNALs need to be created. In addition, the following tags are needed:

   (a) One MAKEINSTANCE with cardinality *every*, as signaled by the expression *every*.

   (b) One TLINK linking the duration *20 minutes* to the event.

   (c) One TLINK linking the TIMEX3 *Monday* to the TIMEX3 *20 minutes*.

   ```
   John
   ```

```
<EVENT eid="e4" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
taught </EVENT>
<SIGNAL sid="s5">for</SIGNAL>
<TIMEX3 tid="t2" type="DURATION" value="PT20M" anchorTimeID="3">
        20 minutes</TIMEX3>
<SIGNAL sid="s6">every</SIGNAL>
<TIMEX3 tid="t3" type="DATE" value="XXXX-WXX-1">Monday</TIMEX3>
<MAKEINSTANCE eiid="ei4" eventID="e4" signalID="s6" cardinality="EVERY"/>
<TLINK eventInstanceID="ei4" relatedToTime="t2" signalID="s5"
        relType="HOLDS"/>
<TLINK timeID="2" relatedToTime="t3" relType="IS_INCLUDED"/>
```

6. *John left between Monday and Wednesday*

```
John
<EVENT eid="e1" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
left
</EVENT>
<MAKEINSTANCE eiid="ei1" eventID="e1"/>
<SIGNAL sid="s1"/>
between
</SIGNAL>
<TIMEX3 tid="t1" type="DATE" value="2002-07-15"
        temporalFunction="true" anchorTimeID="t0"
        valueFromFunction="tf3"/>
Monday
</TIMEX3>
and
<TIMEX3 tid="t2" type="DATE" value="2002-07-17"
        temporalFunction="true" anchorTimeID="t0"
        valueFromFunction="tf3"/>
Wednesday
</TIMEX3>

<TLINK eventInstanceID="ei1" relatedToTime="t1" signalID="s1" relType="IAFTER"/>
<TLINK eventInstanceID="ei1" relatedToTime="t2" signalID="s1" relType="IBEFORE"/
```

This current solution is not completely adequate, but we will keep it
temporarily.
```

7. *John taught from 1994 through 1999.*

   In this case, one `EVENT` and the two `TIMEX3`s need to be created. In addition, the following tags are needed:

   (a) One automatically created `MAKEINSTANCE` for the event.

   (b) One `TLINK` to capture the fact that the event started in 1994.

   (c) One `TLINK` to capture the fact that the event finished in 1999.

   This then should lead to a duration, which is automatically created by the closure part of the tool.

```
John
<EVENT eid="e4" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
taught</EVENT>
<SIGNAL sid="s5">from</SIGNAL>
<TIMEX3 tid="t2" type="DATE" value="1994">1994</TIMEX3>
<SIGNAL sid="s6">through</SIGNAL>
<TIMEX3 tid="t3" type="DATE" value="1999">1999</TIMEX3>

<MAKEINSTANCE eiid="ei4" eventID="e4"/>
<TLINK eventInstanceID="ei4" relatedToTime="t2" signalID="s5"
       relType="BEGUN_BY"/>
<TLINK eventInstanceID="ei4" relatedToTime="t3" signalID="s6"
       relType="ENDED_BY"/>
```

8. *John did not leave on Monday but on Tuesday.*

   One `EVENT`, **two event instances**, and three `SIGNAL`s need to be created:

```
John did <SIGNAL sid="s5">not</SIGNAL>
<EVENT eid="e4" class="OCCURRENCE" tense="PAST" aspect="PERFECTIVE">
leave</EVENT>
<SIGNAL sid="s6">on</SIGNAL>
<TIMEX3 tid="t3" type="DATE" value="XXXX-WXX-1">Monday</TIMEX3>
but
<SIGNAL sid="s7">on</SIGNAL>
<TIMEX3 tid="t4" type="DATE" value="XXXX-WXX-2">Tuesday</TIMEX3n>
<MAKEINSTANCE eiid="ei1" eventID="e4"/>
```

```
<MAKEINSTANCE eiid="ei2" eventID="e4"/>
<SLINK subordinatedEventInstance="ei1" signalID="s5"
        relType="NEGATIVE" polarity="false"/>
<TLINK eventInstanceID="ei1" relatedToTime="t3" signalID="s6"
        relType="IS_INCLUDED"/>
<TLINK eventInstanceID="ei2" relatedToTime="t4" signalID="s7"
        relType="IS_INCLUDED"/>
```

4.3 Causative Examples

1. *The rains caused the flooding.*

```
The
<EVENT eid="e1" class="OCCURRENCE">
 rains
</EVENT>
<EVENT eid="e2" class="OCCURRENCE">
caused
</EVENT>
the
<EVENT eid="e3" class="OCCURRENCE">
Flooding
</EVENT>

<TLINK eventInstanceID=e1 relatedtoEvent=e3  relType="BEFORE" />
<TLINK eventInstanceID=e1 relatedtoEvent=e2  relType="IDENTITY" />
```

2. *John caused the fire.*

```
John
<EVENT eid="e1" class="OCCURRENCE">
caused
</EVENT>
the
<EVENT eid="e2" class="OCCURRENCE">
fire
</EVENT>
<TLINK eventInstanceID=e1 relatedtoEvent=e2  relType="BEFORE" />
```

3. *Kissinger secured the peace at great cost.*

```
Kissinger
<EVENT eid="e1" class="OCCURRENCE">
secured
</EVENT>
the
<EVENT eid="e2" class="OCCURRENCE">
peace
</EVENT>
<TLINK eventInstanceID=e1 relatedtoEvent=e2  relType="BEFORE" />
At great cost.
```

4. *He kicked the ball, and it rose into the air.*

   Discourse relations acting as a causative, we are currently unable to handle as causatives, but we can certainly annotate the temporal relation that exists in the text.

```
He
<EVENT eid="e1" class="OCCURRENCE">
Kicked
</EVENT>
The ball
And
it
<EVENT eid="e2" class="OCCURRENCE">
rose
</EVENT>
Into the air
<TLINK eventInstanceID=e1 relatedtoEvent=e2  relType="BEFORE" />
```