

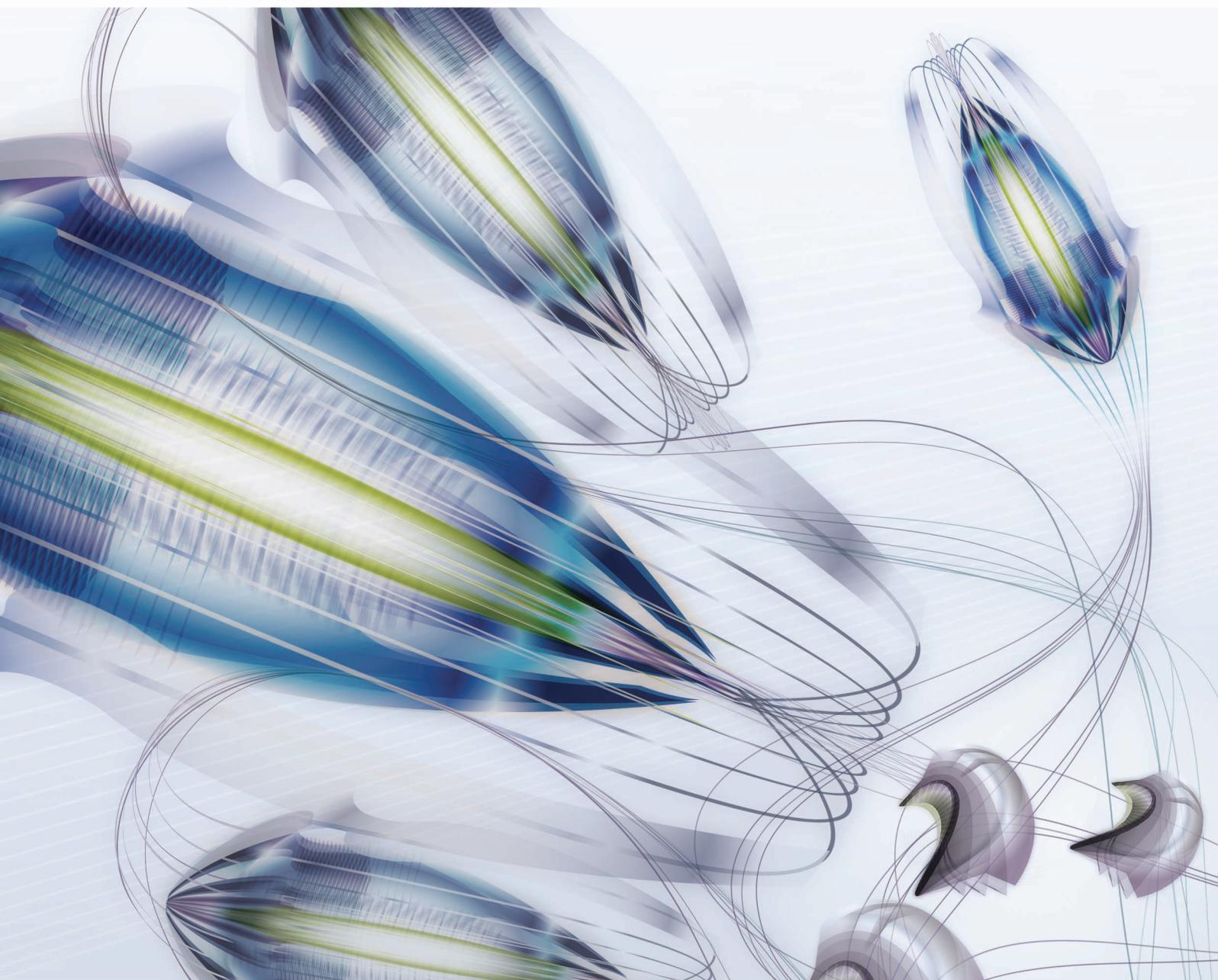
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## Annotation of Negation Cues and their Scope Guidelines v1.0

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# Contents

<b>Preface</b>	<b>1</b>
<b>1 Definition of the annotation task</b>	<b>3</b>
<b>2 Negation cues</b>	<b>7</b>
2.1 Affixal negation . . . . .	7
2.1.1 Infixal negation in noun phrases . . . . .	8
2.2 Contracted negation cues . . . . .	8
2.3 Multiword negation cues . . . . .	9
2.4 Multiple negation cues . . . . .	9
2.4.1 Double negation . . . . .	10
2.4.2 Modality cues embedded in negation cues . . . . .	10
2.5 Negation in interrogatives . . . . .	10
2.6 False negation cues . . . . .	11
2.6.1 Fixed expressions . . . . .	11
2.6.2 Dialogue elements . . . . .	12
2.6.3 Modality cues . . . . .	12
<b>3 Scope</b>	<b>13</b>
3.1 Characteristics of the scope . . . . .	14
3.1.1 The negation cue is out of its scope . . . . .	14
3.1.2 Relevant scope . . . . .	14
3.1.3 The scope can be discontinuous . . . . .	15
3.1.4 Discourse level modifiers and conjunctions . . . . .	15

<b>4</b>	<b>Marking the relevant scope</b>	<b>17</b>
4.1	Negated verb . . . . .	17
4.1.1	Negation of main verb . . . . .	17
4.1.2	Coordination . . . . .	17
4.1.3	Subordination . . . . .	18
4.2	Negated subject . . . . .	19
4.3	Negated object . . . . .	19
4.4	Negated adjective . . . . .	20
4.4.1	Negated adjective in noun phrase . . . . .	20
4.4.2	Negated adjective as attribute in copulative construction . . . . .	20
4.5	Affixes . . . . .	20
4.5.1	Affixes attached to adjectives . . . . .	20
4.5.2	Affixes attached to adverbs . . . . .	21
4.5.3	Infixes . . . . .	21
4.6	Scope not explicit in sentence . . . . .	21
4.7	Special cases . . . . .	22
4.7.1	Except and save . . . . .	22
4.7.2	Without . . . . .	23
<b>5</b>	<b>Special constructions</b>	<b>24</b>
5.1	Ellipsis . . . . .	24
5.2	Existential constructions . . . . .	24
5.3	Expletives . . . . .	25
5.4	Relative pronouns . . . . .	25
5.5	Interrogative pronouns . . . . .	25
5.6	Comparative constructions . . . . .	25
5.7	Imperatives . . . . .	26
5.8	Conditional constructions . . . . .	26
<b>6</b>	<b>Annotating the negated event or property in factual statements</b>	<b>27</b>
6.1	Cases of non-factuality . . . . .	27

6.1.1	General readings . . . . .	28
6.2	Negated verbs . . . . .	29
6.2.1	Copulative and existential constructions . . . . .	29
6.2.2	Multifunctional verbs . . . . .	29
6.3	Negated adjectives and adverbs . . . . .	30
<b>7</b>	<b>Tests</b>	<b>31</b>
7.1	<i>It is not the case that</i> paraphrase . . . . .	31
7.2	Synonymous paraphrase . . . . .	31
7.3	Question-answer . . . . .	31
<b>8</b>	<b>Annotation procedure</b>	<b>33</b>
<b>9</b>	<b>Simplified guidelines</b>	<b>34</b>
9.1	Annotating the negation cue . . . . .	34
9.2	Annotating the scope . . . . .	35
9.3	Annotating the negated event or property in factual statements . . . . .	36
<b>A</b>	<b>List of negation cues per POS</b>	<b>38</b>
A.1	Adverbs . . . . .	38
A.2	Affixes . . . . .	38
A.2.1	Attached to adjective . . . . .	38
A.2.2	Attached to verb . . . . .	40
A.3	Determiners . . . . .	40
A.4	Interjection . . . . .	40
A.5	Pronouns . . . . .	40
A.6	Prepositions . . . . .	40
A.7	Verbs . . . . .	41

# Preface

This document contains the guidelines for the annotation of negation information at sentence level in two Conan Doyle stories, *The Hound of the Baskervilles* and *The Adventure of Wisteria Lodge*. The main reason to choose this corpus is that part of it has been annotated with coreference and semantic roles for the *SemEval Task Linking Events and Their Participants in Discourse* (Ruppenhofer et al., 2010).

In sentences containing negation, the negation cues and their scope are marked, as well as the event or property that is negated. (1) shows an example of how sentences are annotated. The scope is marked with square brackets, the cue in bold and the negated event, if there is one, is underlined.

- (1) [I do]**n't** [know what made me look up], but there was a face looking in at me through the lower pane.

The annotation style is inspired in the BioScope corpus (Vincze et al., 2008), which is a corpus of biomedical texts annotated with negation and speculation information, although there are several differences. A main difference is that the BioScope corpus does not annotate events as being negated or not. According to our annotation guidelines, an event should be marked as negated if it is factual and if it is presented as an event that did not happen. *Event* here is used in a broad sense, including events and states. Another important difference is that the scope model annotated in this corpus is different. The cue is not considered to be part of the scope, the scope can be discontinuous, and all arguments of the event being negated are considered to be within the scope, including the subject, which is kept out of the scope in the BioScope corpus. Additionally, elided elements that belong to the scope are recovered from the context, as shown in (2), where *I could* is marked as part of the scope of *nor*. Another difference with the annotation in the BioScope corpus is that we also annotate affixal negation.

- (2) I tell you, sir, [I could]n't move a finger, **nor** [get my breath], till it whisked away and was gone.

The current annotation focuses on sentential negation, but in the future it will be extended to intersentential negation as in (3), where the negation cue *No* of sentence (3.b) expresses a rejection of the statement in (3.a).

- (3) - Don't blame me.  
- No, sir; I believe you mean well by me.

The annotation of the corpus has been carried out in the framework of the BiographTA project<sup>1</sup>, which aims to develop supervised and semisupervised text mining techniques to perform large scale biomedical

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<sup>1</sup>Website of the BiographTA project: <http://www.cnts.ua.ac.be/BiographTA/>. This study was made possible through financial support from the University of Antwerp (GOA project BIOGRAPH).

relation extraction. Processing negation and modality is one of the research goals within the project because these phenomena are relevant to determine the reliability of the relations extracted.

The annotated corpus can be downloaded from the BiographTA web site. The corpus is in TIGER/SALSA xml format (Erk and Padó, 2004), like the corpus of the *SemEval Task Linking Events and Their Participants in Discourse*.

The document is organised as follows. Chapter 1 describes the annotation task, Chapter 2 introduces negation cues and their annotation, and Chapter 3 deals with the annotation of scopes. Chapter 4 elaborates on how to determine which tokens are within the scope of a negation cue. Some special cases are described in Chapter 5. How to mark the negated event or property is presented in Chapter 6. Tests to find the negation cues and their scope are presented in Chapter 7, the annotation procedure is described in Chapter 8, and Chapter 9 contains a simplified version of the guidelines. Finally, Appendix A lists the negation cues.

# Chapter 1

## Definition of the annotation task

Let us imagine that we are investigating malaria. As researchers, we would like to have access to the information contained in all the relevant publications, but there are so many that we cannot read all of them. In order to overcome this obstacle, we decide to build a system that extracts information automatically. The system would be confronted with fragments of texts like the one presented in (1.1)<sup>1</sup>:

- (1.1) This is an unusual example of resistance detected during a single course of Malarone on only a moderate parasitaemia. The atovaquone/proguanil combination has not been widely used yet in West Africa so it is unlikely that the patient was initially infected with an atovaquone-resistant strain.

An efficient system should be able to detect that the *example of resistance detected* is unusual, instead of usual, since *usual* is negated by *un-*. It should be able to find that the *medication with the atovaquone/proguanil combination* has *not* been used in West Africa. If the system would extract that the medication has been widely used, our investigation on malaria would be based on false facts. The system should also process that it is not likely that *the patient was initially infected*, instead of finding that it is likely that the patient was initially infected. In order to capture these aspects of meaning and not to extract false information, the treatment of negation has to be incorporated in the system.

In these guidelines we aim at describing how to annotate the words that express negation and the part of a sentence that is affected by the negation words. The words that express negation are called *negation cues* and the part of the sentence that is affected by a negation cue is called the *scope*. In the examples that we provide in this document, negation cues are marked in bold and their scope is underlined. The clauses in (1.1) would be marked as follows:

- (1.2) 1. This is an **unusual** example of resistance detected during a single course of Malarone on only a moderate parasitaemia.  
2. The atovaquone/proguanil combination has **not** been widely used yet in West Africa  
3. so it is **unlikely** that the patient was initially infected with an atovaquone-resistant strain.

The negations in the sentences above can be paraphrased by the expression *it is not the case that* followed by the fact that is negated. Thus,

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<sup>1</sup>The example is found in <http://www.biomedcentral.com/content/pdf/1475-2875-1-1.pdf> [last consulted 28-07-2010]

(1.2.1) expresses that it is not the case that *this is a usual example of resistance detected during a single course of Malarone on only a moderate parasitaemia*.

(1.2.2) expresses that it is not the case that *the atovaquone/proguanil combination has been widely used yet in West Africa*.

(1.2.3) expresses that it is not the case that *it is likely that the patient was initially infected with an atovaquone-resistant strain*.

In the examples above the scopes are always continuous, but this is not always the case, as shown in (1.3).

(1.3) A forty-five year old Nigerian male, resident in the UK, presented with a fever and 1.5% P. falciparum parasitaemia two weeks after returning from a 4-week visit to Lagos, Nigeria **without taking prophylaxis**.

The final goal of annotating negation cues and their scope is to determine which events in the sentence are affected by the negation. We will use the term *event* in a very general way. It can be a process, an action, or a state. Detecting negated events is important because negated events are not facts. If we design a system that extracts information automatically, this system should not extract false facts. The quality of being a fact is referred to as *factuality*. As explained in Saurí and Pustejovsky (2009), the factuality of an event can be affected by several phenomena like negation, modality and evidentiality. In (1.4.1) the polarity of the event *rain* is negated. Epistemic modality expresses the degree of certainty in relation to what is asserted. In (1.4.2) the event is presented as being uncertain by using the verb *might*. Evidentiality is related to the expression of the information source of a statement. In (1.4.3) *John* is the source of evidence for the statement where event *rain* is presented.

- (1.4)
1. It does not rain
  2. It might rain
  3. John tells me that it rains

There are degrees of factuality: it ranges from high certainty (1.5.1) or uncertainty (1.5.2) to very low certainty (1.5.3) or uncertainty (1.5.4).

- (1.5)
1. I see clearly that it rains
  2. I see clearly that it does not rain
  3. They say that it might rain
  4. They say that it might not rain

In these guidelines we focus only on annotating information relative to the negative polarity of an event. As reported by Saurí (2008b), the main ways in which negation can be expressed are the following ones<sup>2</sup>:

1. Negating the predicate that expresses the event: *She did **not** follow the rules*.
2. Negating the subject of an event: **Nobody** followed the rules.
3. Negating the object of an event: *She followed **no** rules*.

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<sup>2</sup>We take the examples from the guidelines of FactBank (Saurí, 2008a).

4. The negation is expressed as part of the lexical semantics of the embedding predicate: *She **failed** to follow the rules*

The next chapters present a more exhaustive description of constructions that express negation.

These guidelines are set up on the basis of an initial annotation study of Arthur Conan Doyle's *The Hound of the Baskervilles* (HB from now on) and *The Adventure of Wisteria Lodge*<sup>3</sup> (WL from now on). For the examples that come from HB, we include a number between square brackets with the format [chapter number.sentence number] at the end of the example. For the examples that come from WL, we include a number between square brackets with the format [WLchapter number.sentence number] at the end of the example.

The initial study showed that whereas some negation cases are easy to annotate (for example (1.6)), other cases are more difficult because annotators doubt about whether a word expresses a negation or not, and because it is difficult to determine what exactly is negated.

- (1.6) I did **not** know who you were, but I was determined to find out [12.21]

A case that posed doubts to annotators is (1.7). One annotator considered that *blow to the winds* should be marked as negation cue because one can infer from (1.7) that *our fears* stop existing because they are blown to the winds. This annotator interpreted negation as the expression of absence.

- (1.7) But that cry of pain from the hound had blown all our fears to the winds [14.116]

Similarly, an annotator considered initially that *gone out* could be a negation cue in (1.8) because it can be inferred that *the hope* disappears.

- (1.8) We caught the one clear glimpse of it, and then the match flickered and went out, even as the hope had gone out of our souls [12.182]

However, these guidelines do not account for expressions of absence. We focus on explicit negation that turns an event into a negated event. The negation cue is explicitly expressed by a lexical item. In the cases of negation that we treat, the negated event has to be expressed linguistically in the sentence or by means of an elliptical construction. In (1.7) and (1.8) there are no negated events. When there is a negated event, it is possible to paraphrase the negated event with the construction *it is not the case that* followed by the positive version of the event. Below (1.9.1) has the same meaning as (1.9.2), which contains a paraphrase of (1.9.1) with the construction *it is not the case*. This is why we say that in (1.9.1) the event *know* is negated.

- (1.9) 1. I did **not** know who you were  
2. **It is not the case that** I knew who you were

Because the guidelines that we present here are based on the annotation of HB and WL, they leave out some constructions that are characteristic of other domains, like clinical documents. We present examples (1.10.1) and (1.11.1) from the BioScope corpus (Vincze et al., 2008), which is a collection of biomedical texts annotated with negation and speculation cues.

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<sup>3</sup>The text is freely available from the Gutenberg Project at <http://www.gutenberg.org/browse/authors/d#a37238>

- (1.10) 1. No focal consolidation to suggest pneumonia.  
2. **It is not the case that** focal consolidation suggests pneumonia.

- (1.11) 1. Right middle lobe abnormalities suggest airways disease rather than bacterial pneumonia.  
2. **It is not the case that** right middle lobe abnormalities suggest bacterial pneumonia

We also acknowledge that annotating constructions that express absence of an entity can be interesting for certain information extraction tasks, like text mining of clinical documents, as shown by the following example from the BioScope corpus, in which no event is mentioned explicitly.

- (1.12) Peribronchial thickening without pneumonia

In addition to annotating negation cues and their scopes, we also annotate which events or properties are negated by the negation cue. Only factual events are annotated as negated. As defined in Saurí and Pustejovsky (2009), a factual event corresponds to a fact in the world. In (1.13.1) the event SAY is a fact and is negated, whereas in the rest of examples below the event SAY is not a fact. In (1.13.2) the event is presented in the future, in (1.13.3) it is put as a condition for another event, and in (1.13.4) it is under the scope of a modality cue. In these cases, although we mark the negation cue and the scope, we do not mark the event as a negated fact.

- (1.13) 1. He had **never** said as much before  
2. He will **never** say as much  
3. If he does **not** say anything, we will consider the case closed  
4. It is unclear whether he did **not** say as much before

## Chapter 2

### Negation cues

Negation is expressed by means of words or combinations of words, which are called *negation cues*. These can be verbs, nouns, adverbs, adjectives, prepositional phrases, determiners, etc. In (2.1) the adverbs *no* and *not* are negation cues. In (2.2) the adverb *never* is a negation cue.

(2.1) “**No**, Watson, I fear that I could **not** undertake to recognize your footprint amid all the footprints in the world” [12.15]

(2.2) I **never** was more happy to see anyone in my life [12.9]

In Appendix A we include a list of negation cues sorted by their part-of-speech (POS) tag.

#### 2.1 Affixal negation

Affixes can also be negation cues, for example prefixes such as *un-* in *unsatisfying* or suffixes such as *-less* in *colourless*.

(2.3) You saw me, perhaps, on the night of the convict hunt, when I was so **imprudent** as to allow the moon to rise behind me? [12.25]

(2.4) In that impassive **colourless** man, with his straw hat and his butterflynet, I seemed to see something terrible ... [· · ·] [12.90]

However, not all negative affixes are negation cues. For example the affix *dis-* in *disappear* or *un-* in *unspoken* do not negate their root morpheme. *Disappear* does not mean ‘not appear’, but ‘To pass out of sight; vanish’. *Unspoken* does not mean ‘not spoken’, but ‘understood without the need for words’. Consequently, in (2.5) *unspoken* is not a negation cue:

(2.5) All my **unspoken** instincts, my vague suspicions, suddenly took shape and centred upon the naturalist [12.89]

In (2.6) *less* (from *colourless*) is a negative suffix, but *im-* from *impassive* is not because *impassive* does not mean ‘not passive’, but ‘without emotion; apathetic’.

(2.6) In that impassive colour**less** man, with his straw hat and his butterflynet, I seemed to see something terrible ... [12.90]

Example (2.7) also shows that negative affixes do not always have the negative function. Here, *unknown* is a noun and part of the noun phrase *our unknown*, so the affix *un-* does not negate anything in the sentence.

(2.7) When our unknown had followed Baskerville home we should have had the opportunity of playing his own game upon himself and seeing where he made for. [4.235]

As the examples show, in order to determine whether the affix is a negation cue, the meaning of the lexical item has to be taken into account.

### 2.1.1 Infixal negation in noun phrases

As we saw in example (2.6), it is possible to express negation using affixes, for instance *colourless*. This is also possible by means of infixes in nouns and noun phrases, as (2.8) and (2.9) demonstrate. Here, we annotate the infix *-less-* as the negation cue and the negated nouns *breath-* and *care-* as scope. The suffix *-ness* is never annotated, because it only has a function on the morphological level and not on the semantic level.

(2.8) Their evidence, corroborated by that of several friends, tends to show that Sir Charles’s health has for some time been impaired, and points especially to some affection of the heart, manifesting itself in changes of colour, breath**less**ness, and acute attacks of nervous depression . [4.94]

(2.9) That may point to care**less**ness or it may point to agitation and hurry upon the part of the cutter. [4.91]

## 2.2 Contracted negation cues

If the negation cue is contracted with the verb, for instance in *can’t* or *cannot*, only the negation cue is marked as such: **can’t**, **cannot**, **don’t**.

(2.10) Save from what we heard, we **cannot** even swear to the existence of the latter, since Sir Henry has evidently died from the fall [12.199]

Not – **don’t** tell me that it is our friend Sir Henry! [12.265]

## 2.3 Multiword negation cues

Sometimes negation cues are made up of multiple words, such as *no longer*:

(2.11) The story of the Stapletons could **no longer** be withheld from him, but he took the blow bravely when he learned the truth about the woman whom he had loved [14.230]

Multiword negation cues are often fixed expressions, for instance signifying the gradation of negation: *by no means* in (2.12) and *not for the world* in (2.13).

(2.12) "But that was all." [1.46]

- "No, no, my dear Watson, not all - **by no means** all." [1.47]

(2.13) "Shall I run on and stop them?" [4.195]

- "**Not for the world**, my dear Watson." [4.195]

Multiword negation cues can be discontinuous, like *not ... not* in (2.15) or *neither ... nor* in (2.14):

(2.14) **Neither** the RNA **nor** the proteins of open reading frames 3a and 3b of the coronavirus infectious bronchitis virus are essential for replication

We interpret (2.15) as equivalent to *Neither a whisper nor a rustle rose from the dark figure over which we stooped*. This is why we mark *not ... not* as a discontinuous negation cue.

(2.15) **Not** a whisper, **not** a rustle, rose from the dark figure over which we stooped [12.176]

## 2.4 Multiple negation cues

A sentence can contain more than one negation cue. Each negation cue will have its own scope (see Chapter 3 about scope). Negation cues can also be embedded.

In (2.16), there are three negation cues: *no*, *no*, *un-*. Let us analyse their scopes. The scope of the negation cue *no* is marked in (2.16). The negation cue *un* and its scope (as marked in (2.18)) are embedded in the scope of the second *no* marked in (2.17).

(2.16) There was **no** light save in the dining-room, but Holmes caught up the lamp and left no corner of the house unexplored [14.169]

(2.17) There was no light save in the dining-room, but Holmes caught up the lamp and left **no** corner of the house unexplored [14.169]

(2.18) There was no light save in the dining-room, but Holmes caught up the lamp and left no corner of the house **un**explored [14.169]

### 2.4.1 Double negation

In (2.19.1), the first negation cue *not* scopes over the entire clause. The second negation cue *un-* in (2.19.2) just scopes over *usual*. These two negation cues neutralize each other, since we can paraphrase this sentence as *it was explained that that is a symptom which is usual in cases of dyspnoea and death from cardiac exhaustion*.

(2.19) 1. [...] it was explained that that is a symptom which is **not** unusual in cases of dyspnoea and death from cardiac exhaustion. [2.110]

2. [...] it was explained that that is a symptom which is not unusual in cases of dyspnoea and death from cardiac exhaustion. [2.110]

(2.20) shows another example of double negation resulting in neutralization. The speaker of this sentence does not know how they murdered him, but he DOES know that it was Murillo who struck him down.

(2.20) “How they murdered him I do **not** know, **save** that it was Murillo’s hand who struck him down, for Lopez had remained to guard me.” [WL1.386]

### 2.4.2 Modality cues embedded in negation cues

In this task we do not focus on modality cues (words that express (un)certainty, speculation). However, sometimes it is difficult to distinguish between negation and modality cues when modality cues occur embedded in negation cues. The sentence in (2.21) has a negation cue *no* with the scope marked in (2.21) and a modality cue *slightest sign* with the scope marked in (2.22). The fact that the modality cue accepts a modifier *slightest* indicates that *no signs* is not a fixed expression and that we can interpret it compositionally as a negation cue and a modality cue. (2.23) also shows an example of the modality cue *sign* embedded in the scope of the negation cue *no*.

(2.21) But **no** slightest sign of them ever met our eyes [14.257]

(2.22) But no slightest sign of them ever met our eyes [14.257]

(2.23) We tore away his collar, and Holmes breathed a prayer of gratitude when we saw that there was **no sign** of a wound and that the rescue had been in time [14.127]

Example (2.24) shows another example of an uncertainty cue (*whether ... or not*) that can be mistaken for a negation cue.

(2.24) That should let us know before evening whether Barrymore is at his post in Devonshire or not. [5.93]

## 2.5 Negation in interrogatives

Negation cues can appear in interrogative sentences, as shown in the examples below. However, it is necessary to keep in mind that negation cues can be confused with words that do not express negation

and that not all negation cues negate a fact. In (2.25), it is a fact that the dog is not black, since the question is about whether the dog is in the garden or not. In this case, we annotate the negation cue *n't* and the scope *that is black*. In (2.26), we don't know whether the dog is black or not, which means that we cannot say for a fact if the dog is black. In this case we also annotate *not* as the negation cue and the sentence as the scope of the negation<sup>1</sup>. (2.27) is a third possibility of negation in interrogatives. The apparent negation cue *n't* is actually part of a dialogue check, here *isn't it obvious?*, which is used to ascertain confirmation from the addressee and which we do not annotate as a negation cue. We will discuss this last case in more detail in Section 2.6.2.

(2.25) Was the dog that isn't black in the garden?

(2.26) Wasn't the dog black?

(2.27) Isn't it obvious that the dog is black?

## 2.6 False negation cues

In some cases words have the form of a negation cue, but not the meaning of a negation cue. It is important not to mark these as negations. In (2.28), *nothing* is an example of a false negation cue. The following word *but* neutralizes it, changing the meaning of the sentence to *He would only talk of art*.

(2.28) He would talk of nothing but art, of which he had the crudest ideas, from our leaving the gallery until we found ourselves at the Northumberland Hotel. [5.3]

The next subsections provide an overview of false negation cues.

### 2.6.1 Fixed expressions

Fixed expressions containing false negation cues are not marked as negation cues, like *could not help* in the sentence below, which as a matter of fact indicates that the event *asking* is a fact.

(2.29) Why about Sir Henry in particular? I could not help asking [12.281]

*The Hound of the Baskervilles* is written in early twentieth century English and contains several archaic fixed expressions, some including false negation, such as *as like as not* in (2.30), meaning “in all probability”, “that something will probably happen or is probably true”. Another example of a fixed expression containing a false negation, is *none the less*, for example in (2.31).

(2.30) “**Nothing** of much importance, Mr. Holmes. Only a joke, as like as not.” [4.10-11]

(2.31) “Simple as it has been in its leading features, it has none the less presented surprising difficulties in the way of an arrest.” [WL2.174]

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<sup>1</sup>In a further annotation process described in Chapter 6 we will distinguish between negated and not negated facts. Not negated facts occur usually in conditionals, imperatives and questions.

## 2.6.2 Dialogue elements

Tag questions containing false negative elements are not annotated as negation cues. These particles have a pragmatic function, since the speaker seeks confirmation from the addressee. In (2.32) Holmes wants to check whether Watson has been inside the house, he is not negating that Watson has been inside the house.

(2.32) You have been inside the house, have you not, Watson? [14.31]

Dialogue checks like *don't you think* in (2.33) and *is it not* in (2.34), which express the speaker's expectations about the addressee confirming the statement, are not marked as negations.

(2.33) Don't you think, Watson, that you are away from your charge rather long? [12.115]

(2.34) Is is not the very picture of an old family home? [6.144]

Exclamative expressions are also not marked as negations. In (2.35), *don't tell me* does not express a negated event. This is an expression used to express surprise.

(2.35) "Don't tell me that it is our friend Sir Henry!" [14.79]

## 2.6.3 Modality cues

Some modality cues, such as *no doubt*, contain false negation cues. In (2.36) *no doubt* is a fixed expression that expresses certainty, as well as *without a doubt* in (2.37). Neither (2.36) nor (2.37) contain a negated event.

(2.36) Partly it came *no doubt* from his own masterful nature, which loved to dominate and surprise those who were around him [14.2]

(2.37) *Without a doubt*, Messi is the best player in the world.

In both examples *no doubt* and *without a doubt* are expressions that act at the discourse level. They convey information about the attitude of the speaker towards his statement. The speaker expresses that he is certain that the statement can be presented as a fact.

## Chapter 3

### Scope

A negation cue scopes over the part(s) of the sentence that it negates. The scope of negation has been widely treated in the theoretical literature about negation (Horn, 2001). Here we take a very pragmatic approach. The scope of a negation cue will be such that it allows to determine which events are negated in the sentence. Let us take simple examples:

(3.1) Yesterday it did **not** rain

(3.2) It did **not** rain in Amsterdam

(3.3) Yesterday it did **not** rain in Amsterdam

In (3.1) *not* scopes over *yesterday it did rain*, in (3.2) it scopes over *it did rain in Amsterdam*, and in (3.3) the negation scopes over *yesterday it did rain in Amsterdam*. The negation cue scopes over the predicate and its arguments and complements.

In order to know what falls under the scope of the negation cue, we can apply the *it is not the case that* test. Taking (3.3) as an example, it can be paraphrased as:

(3.4) **It is not the case that** yesterday it rained in Amsterdam.

It would not be correct to paraphrase (3.3) as in (3.5) because some of the negated information would be missing:

(3.5) **It is not the case that** it rained in Amsterdam.

**It is not the case that** yesterday it rained.

The annotation of negation cues and their scope should be useful to capture the meaning of statements. We know that languages often use different constructions to express the same meaning. In this annotation task, we aim at giving the same analysis to negation constructions that have the same meaning. For example, we will analyse similarly the sentences in (3.6). In both cases the negated event is *Watson was prudent*. (3.6.1) uses a negative prefix attached to the adjective *prudent*, whereas (3.6.2) uses the adverb *not* modifying the verb.

- (3.6) 1. Watson was **imprudent**  
2. Watson was **not** prudent

Similarly, different syntactic constructions can be used to express the same meaning. An example are active and passive constructions, which in the annotation of the BioScope corpus are treated differently. Here we consider that the scope of a negative cue does not necessarily depend on the syntactic construction. We would annotate the same scope for the sentences in (3.7), even if (3.7.1) has active voice, and (3.7.2) passive.

- (3.7) 1. Watson did **not** solve the case  
2. The case was **not** solved by Watson

The same would apply to this example extracted from the guidelines of the BioScope corpus:

- (3.8) 1. On the current study we do **not** see the previously demonstrated focus within the mid pole of the right kidney  
2. The previously demonstrated focus within the mid pole of the right kidney is **not** seen on the current study.

Chapter 4 will explain in detail how to determine what part of the sentence belongs to the scope.

## 3.1 Characteristics of the scope

For annotating the scope several factors should be taken into account.

### 3.1.1 The negation cue is out of its scope

Unlike in the annotation of the BioScope corpus, we do not include the negation cue in its own scope. In the examples of previous and next sections we show that we mark the negation cue in bold and that its scope is underlined. We aim at distinguishing clearly what part of the sentence is affected by the change of polarity. A cue does not change its own polarity, this is why we keep it out of the scope.

### 3.1.2 Relevant scope

We mark the longest relevant scope of cues in order to capture the exact meaning of the negation cue. We elaborate on this in Chapter 4. It is also important to know that we never include punctuation such as a full stop or exclamation mark in the scope, unless when the scope includes several clauses separated by a comma.

### 3.1.3 The scope can be discontinuous

Since our goal is to mark only the tokens of the sentence that are affected by the negation cue, we do not consider that the scope has to be a continuous sequence of tokens. In most cases the scope is discontinuous because the negation cue is in between:

(3.9) My word, it does **not** seem a cheerful place, said the detective with a shiver, glancing round him at the gloomy slopes of the hill and at the huge lake of fog which lay over the Grimpen Mire [14.21]

In some cases the scope is continuous, like the scope of *not* in (3.10). Continuous scopes are often found in elliptical constructions, like in (3.10), where the negated verb is elided (the clause could be: *but it was not such a hound as mortal eyes have ever seen*).

(3.10) A hound it was, an enormous coal-black hound, but **not** such a hound as mortal eyes have ever seen [14.107]

In (3.11) the scope is continuous because the negation cue is at the beginning of the sentence:

(3.11) **Not** another sound broke the heavy silence of the windless night [12.156]

### 3.1.4 Discourse level modifiers and conjunctions

Discourse markers such as *yet* in (3.12) are never included in the scope because they are not affected by the negation:

(3.12) "Then you use me, and yet do **not** trust me!" I cried with some bitterness. [12.43]  
"And yet have been **unable** to save him! (12.191)

In (3.13) *however* is not within the scope of *not*.

(3.13) He did **not** pause, however, but bounded onward. [14.113].

In (3.14) *now* does not belong to the scope of *no*.

(3.14) Now, there is **no** one more easy to trace than a schoolmaster [12.101].

However, in (3.15), *even* is not a modifier at discourse level, because it does affect the subject of this sentence, *he*, and is of semantic necessity to the meaning of the sentence.

(3.15) "Watson here knows more about my methods than you do, but I fear that even he has **not** quite grasped the significance of this sentence." [4.51]

Coordinative and subordinative conjunctions are excluded from the scope also, unless they can be arguments of predicates, like relative pronouns, which are at the same time lexical items and subordinative conjunctions. Section 4.1 describes these cases in detail. In (3.16), we find a discourse particle *in fact* and two subordinative conjunctions (*if, that*). None of them would fall under the scope of negations.

(3.16) In fact, if you had **not** gone to-day it is exceedingly probable that I should have gone to-morrow  
[12.66]

## Chapter 4

# Marking the relevant scope

Marking precisely the parts of the sentence that belong to the scope is very relevant to extract the right information. In this section we describe how the scope should be marked. Remember, we never include the final punctuation marks of a sentence within the scope.

### 4.1 Negated verb

When a verb is negated, like in (4.1), the full clause is under the scope of the negation. In (4.1.1) *not* scopes over the clause *we did drive up to the door*, which includes the subject and complement of the verb *drive*, as shown by the paraphrase in (4.1.2)

- (4.1) 1. We did **not** drive up to the door [14.11]  
2. **It is not the case that** we drove up to the door

#### 4.1.1 Negation of main verb

If the negated verb is the main verb of the sentence, the entire sentence is under the scope. In (4.2) the verb *be able* is negated, which is the main verb. Prepositional complements *in half an hour* and *in front of us* need to be included in the scope, because they determine the conditions of the event *not being able to see our hands*.

- (4.2) In half an hour we **won't** be able to see our hands in front of us [14.82]

Similarly, in (4.3) the full sentence is under the scope.

- (4.3) I could **not** make it out when first I saw the light flashing upon the lens [12.30]

#### 4.1.2 Coordination

In coordinate clauses, negation cues scope always only over their clause. In (4.4) there are two clauses (*we did not drive up to the door* and *got down near the gate of the avenue*) coordinated by the conjunction

*but*. The negation cue *not* of the first clause does not scope over the second clause because the conjunction *but* can be considered to be a boundary.

(4.4) We did **not** drive up to the door but got down near the gate of the avenue [14.11]

In (4.5) *not* scopes over *a hound does bite a dead body*, but it does not scope over the conjunction *and*.

(4.5) Of course we know that a hound does **not** bite a dead body and that Sir Charles was dead before ever the brute overtook him [12.344]

In (4.6) there are two coordinate clauses: *If he were acting through a human agent we could get some evidence* and *if we were to drag this great dog to the light of day it would not help us in putting a rope round the neck of its master*. They are coordinated by means of the conjunction *but*. The verb being negated is the main verb of the second coordinate clause. This is why all the elements in the second coordinate clause fall under the scope of the negation.

(4.6) “If he were acting through a human agent we could get some evidence, but if we were to drag this great dog to the light of day it would **not** help us in putting a rope round the neck of its master” [12.335]

### 4.1.3 Subordination

In (4.7) there is a main clause headed by *suppose* and a subordinate clause headed by *run*. The negation scopes over the subordinate clause headed by *run*.

(4.7) I suppose that it does **not** always run loose upon the moor [12.248]

The adverb *never* is also a negation cue that modifies verbs. In (4.8) *never* modifies the verb *was*. The subordinate clause headed by *was* is under the scope of *never*, whereas the main clause headed by *said* is not.

(4.8) “I **never** was more glad to see anyone in my life”; said I as I wrung him by the hand [12.8]

Imagine that we would have the sentence in (4.9), where the negated verb is in the subordinate clause of the second coordinate clause. In this case only the subordinate clause *we were to drag this great dog to the light of the day* would fall under the scope of the negation. We would not include the subordinative conjunction *if* because conjunctions are not included in the scope of the subordinate clause.

(4.9) If he were acting through a human agent we could get some evidence, but if we were **not** to drag this great dog to the light of day it would help us in putting a rope round the neck of its master

In (4.10) *no* scopes over *he did come*, but not over the subordinate conjunction *when*.

(4.10) When he did **not** come I was surprised, and I naturally became alarmed for his safety when I heard cries upon the moor [12.283]

In (4.11) *not* scopes over the main verb *let it go* and thus over the conjunction *unless* and the clause introduced by it.

(4.11) Stapleton would **not** let it go unless he had reason to think that Sir Henry would be there.  
[12.249]

## 4.2 Negated subject

When the subject is negated, the negation scopes over all the clause. In (4.12) the discontinuous negation cues *neither ... nor* is syntactically attached to the subject, but it scopes over all the clause.

(4.12) **Neither** the RNA **nor** the proteins of open reading frames 3a and 3b of the coronavirus infectious bronchitis virus are essential for replication

We can test that this is correct by applying a test:

(4.13) **It is not the case that** the RNA or the proteins of open reading frames 3a and 3b of the coronavirus infectious bronchitis virus are essential for replication

## 4.3 Negated object

When the object of a verb is negated, the negation scopes over the clause headed by the verb. In (4.14) the cue *no* is syntactically attached to the object (*reason*), but it scopes over the clause.

(4.14) I see **no** reason for further concealment [12.359]

We interpret the sentence in (4.14) as expressing the same meaning as the one in (4.15).

(4.15) I do **not** see any reason for further concealment [12.359]

The scope for the negation cue *nothing* in (4.16) is the subject of the clause and the verb.

(4.16) The great ordeal was in front of us; at last we were about to make our final effort, and yet Holmes had said **nothing**, and I could only surmise what his course of action would be [14.6]

We take the clause *Holmes had said nothing* to be equivalent to:

(4.17) Holmes did **not** say anything

## 4.4 Negated adjective

### 4.4.1 Negated adjective in noun phrase

In examples (4.18) and (4.19), the adjectives in the noun phrase are negated. As the scope of this negation, we annotate the noun phrase.

(4.18) “And if we take this as a working hypothesis we have a fresh basis from which to start our construction of this unknown visitor.” [1.51]

(4.19) “As it is, by an indiscreet eagerness, which was taken advantage of with extraordinary quickness and energy by our opponent, we have betrayed ourselves and lost our man.” [4.237]

### 4.4.2 Negated adjective as attribute in copulative construction

When the attribute is negated in a copulative sentence, the negation scopes over the entire clause. A copulative clause is a clause with the verb *to be* as predicate. In (4.20) the affixal cue *im-* is attached to the adjective *prudent*, but it scopes over the entire clause.

(4.20) You saw me, perhaps, on the night of the convict hunt, when I was so imprudent as to allow the moon to rise behind me? [12.25]

We interpret example (4.20) as having the same meaning as (4.21).

(4.21) You saw me, perhaps, on the night of the convict hunt, when I was not prudent as to allow the moon to rise behind me? [12.25]

## 4.5 Affixes

Affixes always scope over the morpheme to which they are attached, and sometimes they scope over the clause or even the entire sentence. In the course of these guidelines, we have come across three cases of affixal negation, which we shall summarize here.

### 4.5.1 Affixes attached to adjectives

In the case of affixes in adjectives that modify a noun, the negation always scopes over the noun phrase. In (4.22), the affix *un-* is attached to the adjective *pleasant*. The negation scopes over the noun phrase *pleasant remembrance*, since the main verb of the sentence, *take*, is not negated, and neither is any other part of the sentence.

(4.22) I will take an unpleasant remembrance back to London with me to-morrow. [12.303]

In copulative sentences, the negation scopes over the entire clause if the attribute is negated. In (4.23) the affixal cue *im-* is attached to the adjective *prudent*, and the negation scopes over the entire clause.

(4.23) You saw me, perhaps, on the night of the convict hunt, when I was so imprudent as to allow the moon to rise behind me? [12.25]

#### 4.5.2 Affixes attached to adverbs

If the negated affix is attached to an adverb that is a complement of a verb, the negation scopes over the entire clause. The verb accompanied by a negated adverb is by definition semantically modified by this adverb, which means that the verb is also influenced by this negation.

(4.24) John danced uncontrollably at his graduation party.

#### 4.5.3 Infixes

Section (4.5.1) already discussed negative affixes in the case of nouns, such as the prefix in *impossible* and the suffix in *clueless*.

Negation is also possible by means of negative infixes, for instance *-less* in *breathlessness* in (4.25) and *carelessness* in (4.26). Only the attached nouns *breath* and *care* are included in the scope of negation cue, since the suffix *-ness* does not function on the semantic level.

(4.25) Their evidence, corroborated by that of several friends, tends to show that Sir Charles's health has for some time been impaired, and points especially to some affection of the heart, manifesting itself in changes of colour, breathlessness, and acute attacks of nervous depression . [4.94]

(4.26) That may point to carelessness or it may point to agitation and hurry upon the part of the cutter. [4.91]

### 4.6 Scope not explicit in sentence

In some cases the scope of a negation cue is not explicit in the same sentence. In those cases we mark the negation cue as such, but we do not mark the scope. In (4.27.2), *No* is the answer to the question in (4.27.1). From the context we know that the scope is *have searched all the huts until you came to this one*. However, we do not mark the scope because it is mentioned in another sentence.

(4.27) 1. "And have no doubt searched all the huts until you came to this one?" [12.27]

2. "No, your boy had been observed, and that gave me a guide where to look" [12.28]

In (4.28.2) the negation cue *no* scopes over *the lady is there* in (4.28.1), but we do not mark it as the scope of *no*.

- (4.28) 1. “You say, Watson, that the lady is **not** there?” Holmes asked when I had finished my report [14.55]  
2. ‘No’ [14.56]

The examples below belong to the same case.

- (4.29) “There, I think” [12.145]  
I pointed into the darkness [12.146]  
No, there! [12.147]

- (4.30) “Can you see anything?” [12.167]  
“Nothing.” [12.168]

## 4.7 Special cases

### 4.7.1 Except and save

Negation cues such as *save* and *except* do not always express negation. Because they are used to express exceptions, they often function as neutralizers of the polarity of the statement expressed in the main sentence where they occur. In (4.31) there are two explicit events: *Marx knew nothing of his customer, he was a good payer*. The first event has negative polarity due to the cue *nothing*. The second event occurs in a clause introduced by the cue *save* and has positive polarity. Additionally, there is a third event: *Marx knew that he was a good payer*. The negative polarity of the first occurrence of the event *know* has been neutralized by *save*. Now the event *know* is presented with positive polarity. In this case *save* would not be marked as a negation cue.

- (4.31) [...] Marx knew nothing of his customer *save* that he was a good payer. [WL2.49]

The scope of *nothing* in the same sentence would be marked as follows:

- (4.32) [...] Marx knew **nothing** of his customer *save* that he was a good payer. [WL2.49]

In (4.33) *save* is not a negation cue either since it does not introduce a subclause with negative polarity. We can infer that the speaker knows that it was Murillo’s hand who struck him down. The scope of *not* would be marked as follows:

- (4.33) ”How they murdered him I do **not** know, *save* that it was Murillo’s hand who struck him down, for Lopez had remained to guard me.” [WL1.386]

In (4.34) *except* would not be marked as a cue for the same reason. It does not introduce an event with negative polarity, since it can be inferred that governess and children go out into the garden.

(4.34) Governess and children hardly go out at all, except into the garden. [WL2.232]

In (4.35) *save* is a negation cue because it introduces an exception to the main event in the sentence, which is positive. We can infer that *it is not the case that in this one excursion, he spent his days in long and often solitary walks, or in chatting with a number of village gossips whose acquaintance he had cultivated.* The scope of *save* is the full sentence.

(4.35) **Save** for this one excursion, he spent his days in long and often solitary walks, or in chatting with a number of village gossips whose acquaintance he had cultivated. [WL2.115]

#### 4.7.2 Without

*Without* introduces clauses or noun phrases which are complements of nouns or verbs. Its scope will be the phrase that it introduces.

(4.36) "[...] I will ask you also to do it blindly, **without** always asking the reason." [13.386]

(4.37) I should be glad to be able to say afterwards that I had solved it **without** your help. [WL2.100]

(4.38) Sufficient for me to share the sport and lend my humble help to the capture **without** distracting that intent brain with needless interruption. [WL2.110]

## Chapter 5

# Special constructions

### 5.1 Ellipsis

An elliptical construction is a construction in which an element is not explicitly expressed that is recoverable or inferable from the context. Sometimes the elliptical element is recoverable from the same sentence. We mark elliptical elements as the scope of the negation cue if they are recoverable from the same sentence. For example, in (5.1) the cue *not* scopes over *the lady is his sister* because *the lady is* is elided before *not*. The negated part of the clause can be paraphrased by *It is not the case that the lady is his sister*. (5.2) is a similar case.

(5.1) I repeat that the lady is his wife and **not** his sister [12.87]

(5.2) We can understand his taking an evening stroll, but the ground was damp and the night **inclement**. [3.239]

In (5.3) the elided part is *an investigator needs*. The negated part of the clause can be paraphrased by *It is not the case that an investigator needs legends or rumours*.

(5.3) An investigator needs facts and **not** legends or rumours [12.309]

### 5.2 Existential constructions

In existential constructions, the existential subject is also part of the scope if it is negated by the negation cue.

(5.4) There was **no** light save in the dining-room ... [14.169]

### 5.3 Expletives

Expletive pronouns are also marked in the scope.

(5.5) It has **not** been a satisfactory case [12.310]

### 5.4 Relative pronouns

Relative pronouns that occur in negative subordinate clauses fall under the scope of the negation cue because they are complements of predicates and contribute information about the predicate being negated. We mark the scope of the relative pronoun *where* in (5.6).

(5.6) We helped him to a rock where he could **not** be seen.  
There is only one place where he **cannot** be found.

In (5.7) we would mark the scope of the relative pronoun *which*.

(5.7) The cytochrome b gene of isolate NGATV01 showed a single mutation, Tyr268Asn which has **not** been seen previously.

### 5.5 Interrogative pronouns

Interrogative pronouns such as *when* and *why* are included in the scope because they are complements of predicates and can be affected by the negation.

(5.8) Why should we **not** arrest him at once? [12.329]

### 5.6 Comparative constructions

Some sentences with comparative constructions can pose doubts. In (5.9) *never* scopes over *I drink more than two glasses* because the negated event is that the speaker drinks more than two glasses.

(5.9) I **never** drink more than 2 glasses

In Section 7.3 we provide a test to determine which is the scope of *never* in an example similar to (5.10).

(5.10) I had often suffered under it, but **never** more so than during that long drive in the darkness

The negated part of 5.10 can be paraphrased as: *it is not the case that I had suffered under it more so than during that long drive in the darkness*.

## 5.7 Imperatives

Events that are complements of predicates related to imperative constructions (orders, requests, etc.) are never facts, but they have a polarity, they can be positive (*I request you to go*), or negative (*I request you not to go*). In this constructions is also possible to marc negation cues and their scope. In (5.11) the subject of the request and the request predicate (*I request*) are elliptical. *Not* scopes over *to talk above a whisper*.

(5.11) I must request you to walk on tiptoe and **not** to talk above a whisper [14.24]

## 5.8 Conditional constructions

If the negation cue is present in the subordinate clause of a conditional construction, the cue scopes only over the subordinate clause, without including the conditional conjunction.

(5.12) In fact , if you had **not** gone to-day it is exceedingly probable that I should have gone to-morrow. [12.66]

## Chapter 6

# Annotating the negated event or property in factual statements

Unlike annotating the scope of the negation cue, where we include the longest relevant scope, we minimize the elements marked as *negated* for the annotation of factual negated events or properties. The negated element(s) is the main event or property actually negated by the negation cue, for example the verb *said* in (6.1). In the guideline examples, we will mark the *negated* element(s) in italics.

(6.1) He had **never** *said* as much before [...] [1.29]

The negated element is the factual event that is affected by the negation. If the negation has no scope, there can be no negated event. We never mark the determiners, modifiers or auxiliaries of negated events, because we aim to minimize the marked elements for negated event annotation. In (6.2), a copulative construction, we mark the predicate of the ‘lexically empty’ verb *is*, which is *unable*. Since we want to limit the amount of elements annotated, we mark only the head of the phrase.

(6.2) He declares that he heard cries but *is* **unable** to state from what direction they came. [2.109]

### 6.1 Cases of non-factuality

Only events or properties that occur in factual statements are marked as negated. In the following cases we do not annotated the seemingly negated element, because these constructions do not express factual statements:

- Imperatives (i.e. *Don't ... !*)
- Non-factual interrogatives (i.e. *Don't you think that ... ?*)
- Conditional constructions (i.e. *If ...*)
- Modal constructions (i.e. *He may ..., Probably ..., Maybe ...* )
- Wishes or desires (i.e. *I hope that ..., I want you to ..., I wish that ..., You should ...*)

- Suppositions or presumptions (i.e. *I suppose that ...*, *I trust that ...*, *I fear that ...*, *I presume that ...*, *I think that ...*, *He claims to ...*)
- Future tense (i.e. *You will ...*, *You would ...*, *You shall ...*)

In (6.3), an imperative, the negation cue apparently negates the verb *move*, but since it is merely an order, we cannot know whether Watson is actually not going to move or not, so we do not annotate the verb as *negated*. (6.4) is an example of a conditional construction. An example of a modal, and therefore non-factual, statement is (6.5), where modality is expressed by *possibly*. *To trust* is also a verb expressing a degree of non-factuality, for instance in (6.6), which is also an interrogative sentence. In 6.7 no negated event is marked because *not* occurs in a conditional clause headed by a verb in past perfect.

(6.3) Don't move, I beg you, Watson. [1.97]

(6.4) “By thunder, if that chap can't find my missing boot there will be trouble.” [7.33]

(6.5) Possibly I had taken no step since I had been upon the moor which had not been observed and reported. [11.275]

(6.6) “I trust that there is nothing of consequence which I have overlooked?” [1.38]

(6.7) Had the prosaic finding of the coroner not finally put an end to the romantic stories which have been whispered in connection with the affair, it might have been difficult to find a tenant for Baskerville Hall. [2.113]

To avoid overlooking non-factual statements, we suggest that the annotator goes through three steps before actually annotating the negated element:

1. Is the sentence imperative, (non-factual) interrogative, conditional, modal? Does it express a wish or desire, a supposition or presumption? Is the verb expressed in future tense? (If yes to any of these questions, do not annotate the negated element)
2. What is the main negated event or property? (Do not annotate determiners, modifiers or auxiliaries)
3. Annotate one (or more) elements as *negated*.

### 6.1.1 General readings

Even though general readings can be conceived as being non-factual, we interpret them as belonging to the category of factual statements. Keeping in mind that the biomedical field will benefit greatly from negation and factuality detection, and considering that in biomedical texts general readings are very important, we consider them to be factual, for example in (6.8).

(6.8) Some people **without** possessing genius have a remarkable power of stimulating it. [1.27]  
One cannot always have the success for which one hopes. [12.308]

## 6.2 Negated verbs

Verbs can be negated either by an affix (6.9) or by an external negation cue (such as *not*) (6.10). In the case of a negative affix, the affix is marked as the negation cue and the attached verb is marked as the negated event. In the case of an external negation cue, the main verb (the one that has lexical meaning) is marked as the negated event. In (6.11), the verbs *has* and *been* are auxiliary verbs; the main verb is *seen*.

(6.9) Our client smoothed down **un**brushed hair and felt **un**shaven chin. [WL1.51]

(6.10) [...] you *know* **not** whether for good or ill. [1.99]

(6.11) Miss Burnet has **not** been seen by any human eye since the night of the murder. [WL2.255]

In (6.12), the main verb marked here is *can*, since the ability to apply for a warrant is negated, and the event of *applying* is not negated.

(6.12) There is **nothing** upon which we can apply for a warrant. [WL2.262]

### 6.2.1 Copulative and existential constructions

In negative copulative (6.13) and existential (6.14) constructions, we do not mark the verb (*to be*) as negated event, since the verb is lexically ‘empty’.

In these cases, we mark the predicate *sick* in (6.13) and *man* in (6.14). Because we aim to minimize the negated events, we take only the head of the NP in (6.14), *sick*, and not the entire NP, *sick man*.

(6.13) He is **not** sick.

(6.14) There is **no** sick man.

### 6.2.2 Multifunctional verbs

Verbs such as *can*, *will*, *have* and *let* can be used in different syntactical constructions.

*Can* and *could* can be used as a modal (6.15) or as the lexical verb ‘being able to’ (6.16). In the case of (6.15), we do not annotate a negated event, because the modality of the main verb expresses uncertainty. In the case of (6.16), the verb *can* has lexical meaning (‘they are not able to get something out of him’) and is therefore the main factual negated event in this sentence, and should be marked as such.

(6.15) ”[...] he could **not** have been on the staff of the hospital [...].” [1.66]

(6.16) [...] we *can* get **nothing** out of him. [WL2.160]

The verbs *will*, *shall*, and *would* can be used as an auxiliary expressing the future tense (in (6.17)) or as an empty auxiliary (in (6.18)). In the case of (6.17), *shan* expresses the future tense, making the sentence non-factual. Therefore, there is no negated event. In (6.18), the main event is *letting me touch the tips of her fingers*, *would* merely acts as an auxiliary indicating past tense. Since we minimize the marked elements, we only annotate the key verb, *let*.

(6.17) I shan 't forget the face at the carriage window as I led her away. WL2.295]

(6.18) And yet he would not so much as let me touch the tips of her fingers. [9.113]

*Have* also has two functions: as an auxiliary (6.19) and as a lexical verb (possessive *have* in (6.20)). As an auxiliary, in (6.19), *have* does not carry any lexical meaning in this sentence. The expression *come to a conclusion* is the negated event in this case. In the case of (6.20), we are dealing with a possessive *have*, namely *having notion of something*. We annotate only the verb, not its predicate *notion of his errand*.

(6.19) “I have not come to any conclusion.” [7.93]

(6.20) We [...] have no notion of his errand. [1.13]

### 6.3 Negated adjectives and adverbs

If an adverb or adjective is negated by an affix, the affix is the negation cue and the attachment is the negated element. In (6.21), the scope of the negation cue *un-* is *an -practical man*, but the actual negated element in this noun phrase is *practical*.

(6.21) I recognized that I am myself an unpractical man and because I am suddenly confronted with a most serious and extraordinary problem. [1.145]

In the case of comparatives, such as in (6.22) and (6.23), we do annotate the comparative adjective, instead of just the head of the NP.

(6.22) There is nothing more stimulating than a case where everything goes against you. [5.189]

(6.23) “I never was more glad to see anyone in my life.” [12.9]

# Chapter 7

## Tests

The annotation of semantic phenomena can be difficult. It is necessary to define tests that can be applied when doubts arise about the meaning and scope of negation cues.

### 7.1 *It is not the case that* paraphrase

The *it is not the case that* paraphrase is a test to check whether there is a logic negation. Taking (7.1.1) as example, if we want to know which part of the sentence is negated, we build a synonymous sentence with *it is not the case that*, as shown in (7.1.2).

- (7.1) 1. "We heard **nothing** of the kind" said I [12.290]  
2. I said that **it is not the case that** we heard anything of the kind

### 7.2 Synonymous paraphrase

The synonymous paraphrase is a test to clarify doubts about which parts of the sentence are affected by the scope. Let us take (7.2) as an example. We would like to know whether *no* scopes over *will* or over *you bear him good will*.

- (7.2) You bear him no good will.

We check whether the paraphrase of (7.2) in which the negation is attached to *bear* instead of *will* is synonymous. If it is, as shown in (7.3), then the negation scopes over the clause *you bear him good will*.

- (7.3) You do not bear him good will.

### 7.3 Question-answer

Another test that allows to determine the scope of a negation cue is the *question-answer test*. Let us analyse (7.4). We would like to know whether *not* scopes only over *drive* or over the clause *we did drive*

*up to the door.*

(7.4) We did not drive up to the door

We put the following questions:

Question 1: Can we infer from (7.4) that they drove?

Question 2: Can we infer from (7.4) that they drove up to the door?

The answer to Question 1 is “yes”, which means that the general driving event is not negated. The answer to Question 2 is “no”, which means that the specified event *driving to the door* is negated. Consequently, the scope of the negation is the clause *we did drive up to the door*.

Let us apply the test to (7.5), which is uttered by Watson:

(7.5) I never suffered more than during that long drive in the darkness

We put the following questions:

Question 1: Can we infer from (7.5) that Watson suffered?

Question 2: Can we infer from (7.5) that Watson suffered during that long drive in the darkness?

Question 3: Can we infer from (7.5) that Watson suffered more than during that long drive in the darkness?

The answer to Questions 1 and 2 is “yes”, whereas the answer to Question 3 is “no”, which means that the cue scopes over *Watson suffered more than during that long drive in the darkness*.

## Chapter 8

# Annotation procedure

The corpus was annotated by three annotators, two master students and an experienced researcher, all of them with a background in linguistics. Of the two master students, one had previous experience with annotating data, so we refer to her as advanced master student. The experienced researcher produced the annotation guidelines in collaboration with the advanced master student. The three annotators based their annotation on the annotation guidelines. A preliminary version of the guidelines was produced by analyzing negation in Chapter 10 of *The Hound of the Baskervilles*. The experienced researcher and the advanced master student annotated this chapter separately based on the preliminary guidelines. Disagreements were discussed, as well as new cases and cases that were not properly described in the guidelines. A second preliminary version of the guidelines was produced and then the same annotators and another experienced researcher who had not seen the guidelines before annotated Chapter 11, in order to test their robustness. After a second process of discussion, the guidelines were modified and the first version of the guidelines was produced. Based on this version the three annotators annotated *The Adventure of Wisteria Lodge* and the remaining chapters of *The Hound of the Baskervilles*. The master student who did not participate in the production of the guidelines was trained by annotating Chapters 10 and 11 of *The Hound of the Baskervilles*. The final adjudicated version of the annotation was produced by the experienced researcher. In cases of disagreement between annotators the closest solution to the guidelines indications was selected.

The annotation was made using the Salto Tool (Burchardt et al., 2006). A *Negation* frame was created, which is assigned to the negation cue. The frame has two elements: *scope* and *negated\_event*. In this way the same resources used to annotated the corpus with coreference and semantic roles for the *SemEval Task Linking Events and Their Participants in Discourse* could be used to annotated negation.

## Chapter 9

# Simplified guidelines

Here we provide a simplified guide to be consulted when doubts arise about how to annotate the cues and the scope. The main factors to take into account are:

- Negation cues are explicitly expressed by a lexical item. They can be a word or a multiword item, and they can be discontinuous.
- The negated event has to be expressed linguistically in the sentence or by means of an elliptical construction.
- When the scope is not explicit in the sentence, we mark only the negation cue.
- The negation cue is always out of the scope.
- The scope can be discontinuous.
- The main test to check which part of the sentence is within the scope is the *it is not the case that* test (see Section 7.1).
- Constructions with the same meaning will receive the same analysis.

### 9.1 Annotating the negation cue

1. Is the negation cue embedded in a contracted form with an auxiliary (e.g. *don't*) or a modal verb (e.g. *can't*)? (Section 2.2)

Mark only the negation cue: e.g. **don't**

2. Is the potential negation cue an affix? (Section 2.1)

Not all negative affixes are negation cues. Check whether the lexical item without the cue has the opposite meaning than the lexical item with the cue. If it does, mark it as a cue, else don't.

E.g.: *color* vs. *colorless*: *-less* is a negation cue.

E.g.: *spoken* vs. *unspoken*: *un-* is not a negation cue.

3. Can the negation cue be discontinuous? (Section 2.3)

*Neither ... nor* is a discontinuous cue, *not ... not* can be also discontinuous.

4. Is the potential negation cue a dialogue element? (Section 2.6.2)

Dialogue elements are not marked as negation cues. These particles have a pragmatic function, their meaning is analyzed at the discourse level. E.g.:

(9.1) Dialogue check: Don't you think, Watson, that you are away from your charge rather long? [12.115]

(9.2) Exclamative particles: Don't tell me that it is our friend Sir Henry! [14.79]

(9.3) Tag questions: You have been inside the house, have you not, Watson? [14.31]

5. Is the potential cue part of a fixed expression that does not express negation? (Section 2.6.1)

In some fixed expressions potential cues lose their negative meaning. E.g. *can/could not help*:

(9.4) Why about Sir Henry in particular? I could not help asking [12.281]

6. Is the potential cue embedded in a modality cue? (Section 2.6.3)

Some modality cues, such as *no doubt*, *without a doubt* contain false negation cues. These are expressions that act at the discourse level. They convey information about the attitude of the speaker towards his statement and, thus, should not be tagged as negation cues.

## 9.2 Annotating the scope

1. In case of doubt, the *it is not the case that* test should be applied (Section 7.1) to determine which part of the sentence is affected by a negation cue.

2. What to do with discourse level modifiers, e.g. *however*, *yet*? Discourse level modifiers are not included in the scope (Section 3.1.4). E.g.:

(9.5) He did **not** pause, however, but bounded onward [14.113]

(9.6) Then you use me, and yet do **not** trust me! [12.43]

3. How is the scope marked in coordinate clauses? Negation cues scope always only over their clause. What to do with coordinate conjunctions, e.g. *and*? The coordinate conjunction that introduces the clause that contains the negation is not included in the scope (Section 4.1.2).

(9.7) ... at last we were about to make our nal effort, and yet Holmes had said **nothing** ... [14.6]

4. How is the scope marked in subordinate clauses? The negation scopes over the subordinate clause. What to do with subordinate conjunctions, e.g. *that*? The subordinate conjunction that introduces the clause that contains the negation is not included in the scope (Section 4.1.3).

(9.8) Of course we know that a hound does **not** bite a dead body [12.344]

5. Is the subject negated? The negation scopes over all the clause (Section 4.2).

6. Is the object negated? The negation scopes over all the clause (Section 4.3).

7. Is the attribute of a copulative construction negated? The negation scopes over all the clause (Section 4.4).

8. Is an adjective negated with an affix? The negation scopes over all the clause if the adjective does not modify the subject (Section 4.4).

(9.9) I will take an unpleasant remembrance back to London with me to-morrow [12.303]

If the adjective modifies the subject, then it scopes only over the adjective and the modified noun.

(9.10) The imprudent detective arrived late

9. Is the negation cue embedded in an elliptical construction? Sometimes the elliptical element is recoverable from the same sentence. We mark elliptical elements as the scope of the negation cue if they are recoverable from the same sentence (Section 5.1).

(9.11) I repeat that the lady is his wife and not his sister [12.87]

10. Is the negation cue embedded in an existential construction? The existential subject is also part of the scope if it is negated by the negation cue (Section 5.2).

(9.12) There was no light save in the dining-room [14.169]

11. Expletive pronouns are also marked in the scope (Section 5.3).

(9.13) It has not been a satisfactory case [12.310]

12. Relative pronouns that occur in negative subordinate clauses fall under the scope of the negation cue (Section 5.4).

(9.14) We helped him to a rock where he could not be seen.

13. Interrogative pronouns such as when and why are included in the scope (Section 5.5).

(9.15) Why should we not arrest him at once? [12.329]

### 9.3 Annotating the negated event or property in factual statements

1. Is the event in imperative, future, conditional? Is it in a (non-factual) interrogative clause? Does it express a wish or desire, a supposition or presumption? (If yes to any of these questions, do not annotate the negated element).
2. What is the main negated event or property? (Do not annotate determiners, modifiers or auxiliaries).

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# Appendix A

## List of negation cues per POS

### A.1 Adverbs

NEVER

(A.1) “I never was more glad to see anyone in my life” said I as I wrung him by the hand [12.8]

NO LONGER

(A.2) The story of the Stapletons could no longer be withheld from him, but he took the blow bravely when he learned the truth about the woman whom he had loved [14.229]

NOT

(A.3) The surprise was not all on one side, I assure you [12.11]

(A.4) An investigator needs facts and not legends or rumours [12.308]

NOT ... NOT

(A.5) Not a whisper, not a rustle, rose now from the dark figure over which we stooped [12.176]

BY NO MEANS

(A.6) “No, no, my dear Watson, not all - **by no means** all.” [1.47]

### A.2 Affixes

#### A.2.1 Attached to adjective

IM-

(A.7) “You saw me, perhaps, on the night of the convict hunt, when I was so imprudent as to allow the moon to rise behind me?” [12.24]

(A.8) Holmes’s face was turned towards it, and he muttered impatiently as he watched its sluggish drift [14.61]

IN-

(A.9) In that impassive colourless man, with his straw hat and his butterfly-net, I seemed to see something terrible – a creature of infinite patience and craft, with a smiling face and a murderous heart [12.90]

(A.10) So as the fog-bank flowed onward we fell back before it until we were half a mile from the house, and still that dense white sea, with the moon silvering its upper edge, swept slowly and inexorably on [14.84]

IR-

(A.11) On its jagged face was spread-eagled some dark, irregular object [12.172]

-LESS

(A.12) For a moment or two I sat breathless, hardly able to believe my ears [12.0]

(A.13) In that impassive colourless man, with his straw hat and his butterfly-net, I seemed to see something terrible – a creature of infinite patience and craft, with a smiling face and a murderous heart [12.90]

(A.14) Far away on the path we saw Sir Henry looking back, his face white in the moonlight, his hands raised in horror, glaring helplessly at the frightful thing which was hunting him down [14.114]

UN-

(A.15) “As it is, I have been able to get about as I could not possibly have done had I been living in the Hall, and I remain an unknown factor in the business, ready to throw in all my weight at a critical moment” [12.48]

(A.16) “You would have wished to tell me something, or in your kindness you would have brought me out some comfort or other, and so an unnecessary risk would be run” [12.51]

### A.2.2 Attached to verb

-NOT

(A.17) Save from what we heard, we cannot even swear to the existence of the latter, since Sir Henry has evidently died from the fall [12.199]

-N'T

Don't let them know that they are watched [14.38].

UN-

(A.18) “And when she is undeceived?” [12.111]

### A.3 Determiners

NO

(A.19) I had no idea that you had found my occasional retreat, still less that you were inside it, until I was within twenty paces of the door [12.12]

### A.4 Interjection

NO

(A.20) **No**, Watson, I fear that I could not undertake to recognize your footprint amid all the footprints of the world [12.14]

### A.5 Pronouns

NOTHING

(A.21) “Can you see anything?” “**Nothing.**” [12.167-168]

(A.22) “We heard nothing of the kind” said I [12.290]

### A.6 Prepositions

WITHOUT

(A.23) Some people **without** possessing genius have a remarkable power of stimulating it. [1.27]

## A.7 Verbs

FAIL

(A.24) I fail to see how you could have done more. [4.233]

# Index

## cue

't, 6  
-less, 5, 6, 19, 36  
by no means, 7  
fail, 2, 38  
im-, 5, 12, 18, 19, 35  
in-, 18, 36  
ir-, 36  
n't, 6, 9, 15, 37  
neither ... nor, 7, 17  
never, 5, 16, 23, 35  
no, 2, 3, 5, 8, 17, 19, 22, 29, 37  
no longer, 7, 35  
nobody, 2  
not, 1–3, 5, 11–13, 15–18, 22, 23, 35, 37  
not ... not, 7, 35  
not for the world, 7  
nothing, 17, 29, 37  
rather than, 4  
save, 8  
un-, 1, 7, 18, 19, 36, 37  
without, 21, 37

## discourse particle

however, 13  
in fact, 14  
now, 13  
yet, 13

## modality cue

no doubt, 10  
sign of, 8  
without a doubt, 10

## non cue

as like as not, 9  
could not help, 9  
dialogue check, 10  
exclamation, 10  
none the less, 9  
question tag, 10

## test

it is not the case that, 1, 29  
question-answer, 29  
synonymous paraphrase, 29