

# Further remarks on annotating negation

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## 1 Introduction

We present here additional annotated data for the task of automatically detecting negation. The data is annotated for cue, scope and event according to the guidelines released during the \*SEM2012 Shared Task. The annotation is in CoNLL format, where each negation instance is represented by three different columns, the first containing the cue, the second the scope and the third the event.

The data is arranged into three different directories:

- **raw**: contains the original sentences
- **full**: contains the sentences *fully* annotated for negation
- **exp**: contains the sentences annotated as they were used in the experiment.

The difference between **full** and **exp** lies in the fact that for the latter we kept only the negation instance relevant to the experiment. For instance, in the following sentence used in the **prefixal** experiment (see paper for more details)

(1) Inconvertible money is money that can not be converted into gold and silver

there are two negation instances, one around the cue **in-**(convertible) and the other around the cue **not**. Since the sentence is used to test the performance on prefixal negation, we exclude the other instance in our experiment but we keep the annotation and store in the **full** folder.

In the each of these folders the sentences are divided into different files according to the experiment they were used for.

Finally, although the original guidelines cover most cases, we deemed necessary to make a few clarifications or point out some of its problems, as shown in the following sections.

## 2 Relative pronouns

In the case of a relative pronoun introducing subordinate sentences, we follow the guidelines in annotating that pronoun as part of the scope only when adding information to the negated predicate. This is for example the case at p. 25 of the guidelines:

- (2) We helped him to a rock {where he could} **not** {be seen}. (where = at the rock)

However, when the relative pronoun do *not* add information to the subordinate it introduces and functions merely as a link between this and the main clause we do *not* include it as part of the scope

- (3) They now also include descendants of Tamil speaking people even when {they} **no longer** {speak Tamil language} .

We follow the guidelines in considering the relative pronoun as part of the scope when it takes the function of subject/object of the negated predicate in a subordinate clause.

- (4) This was caused by an argument between the British Parliament and the Scottish Parliament , {which left} **neither** {the M6} **nor** {the A74 ( M ) being built} .  
(which = an argument between the British Parliament and the Scottish Parliament)

## 3 Negation on adverbs

The original guidelines state that when a negation affix is attached to an adverb the scope spans the entire clause. The annotations are however not consistent with such guideline; sometimes it is just the adverbial root to be included in the scope of negation (5a), other times is the entire clause (5b).

- (5) a. [...] tossing {rest} **less** {ly}  
b. [...] {glaring help} **less** {ly at the frightful thing which was hunting him down}

Given that consistency might harm the performance of the classifier, we stick to the original guidelines in annotating the entire clause as part of the scope in cases of morphological negation on adverbs.

In future work, we are planning however to change scope annotation involving adverbs to include only the adverbial root as scope. This is because the scope of the adverbial element does not span over the entire clause, as shown in (3).

- (6) Template 1 has been **in**{correctly} substituted  
(7) \*It is incorrect that Template 1 has been substituted (sentence-level paraphrase)

This also involves sentences where negation is adverbial and clausal but what is negated is in reality the adverb.

- (8) Template 1 has **not** been {correctly} substituted

- (9) \*It is not the case that template 1 has been substituted (*it is not the case that... test*)
- (10) It is not the case that template 1 has been substituted correctly (*it is not the case that... test*)

## 4 Negation on the subject

When negation on the subject is expressed by an adverb, we consider the entire clause as the scope:

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

However if negation is expressed by an affix on the modifier of a subject NP, we annotated as scope the NP only.

- (12) {An} **ir**{rational number} can not be fully written in decimal form

## 5 Negation on NP

The original guidelines state that negated attributive adjectives have scope over the entire NP (p.20). However the annotations are not consistent, sometimes excluding, as shown in (13), other modifiers, if any, in the negated NP.

- (13) A dabbler in science, Mr. Holmes, a picker up of shells on the shores of {the} great **un**{known ocean}.

In annotating we follow the above example in the case a negated NP has more than one modifiers, where we mark the negated modifier and the head *only* as part of the scope. For instance in the NP:

- (14) {a} prosperous and **in**{dependent geographic region} reaching as far as the Indus river

we exclude the first modifier and the gerundive construction because they fail the 'It is not the case that...' test (as shown in (15b))

- (15) a. It is not the case that it is a dependent geographic region reaching as far as the Indus river (but it is prosperous and reaches as far as the Indus river)
- b. \* It is not the case that it is a prosperous and dependent geographic region reaching as far as the Indus river.

Another example of scope annotation in a negated NP is the following:

- (16) {an} **in**{divisible} , secular , democratic and social {Republic}.

given that:

- (17) a. It is not the case that it is a divisible Republic (but it is secular, democratic and social)
- b. \* It is not the case that it is a divisible , secular , democratic and social Republic

## 6 Negation raising

Negation raising takes place when the a small class of verb (psych verbs: to think, to believe, etc.) appearing in the matrix clause *attracts* the negation cue, which moves from the position it is intended to be read. For instance in 18a, the verb *think* attracts the cue **not**, which is moves to the matrix clause from the subordinate clause, where it can be instead interpreted semantically

- (18) a. The Aboriginal people did not think that the land belonged to them
- b. The Aboriginal people thought that {the land did} **not** {belonged to them}

The Sherlock Holmes annotations seem to disregard cases of negation raising involving psych verb, as shown in the following example.

- (19) Baskerville\_07, 77: {I do} **not** {think that it is likely}

As for negation on adverbs, we disregard negation raising in the present work for reasons of consistency; however, we will address this problem in future work.