1 Grammatical Relations

The simplest classification approach considered the relative frequency of different grammatical relations. For this approach, the governor and the dependent of the dependencies were ignored, with only the relation itself being used.

Each data set instance contained 52 numerical attributes, one for each relation in the Stanford Dependency system. For each attribute A_r corresponding to the relation r, the corresponding value was n_r/n_t, where n_r and n_t were the number of occurrences of the relation r and the total number of relations in the text, respectively.

A C4.5 decision tree classifier trained on these instances produces the decision tree shown in Algorithm 1.1. The full names for the seven relations are shown in Table 1.1. The following subsections explore the linguistic reasons why these particular relations should be so useful in classifying the texts.

Algorithm 1.1 C4.5 decision tree classifier

```
if complm ≤ 0.011635 then
    if purpcl ≤ 0.000856 then
        if rcmod ≤ 0.012254 then
            en(34.0)
        else
            if prt ≤ 0.002113 then
                es(4.0/1.0)
            else
                en(6.0)
    else
        if purpcl ≤ 0.001191 then
            if advmod ≤ 0.045825 then
                es(6.0)
            else
                en(2.0)
        else
            en(7.0)
else
    if mark ≤ 0.00808 then
        en(6.0)
    else
        if aux ≤ 0.044037 then
            en(6.0/1.0)
        else
            en(60.0)
```

Table 1.1: Relation abbreviations

| advmod	adverbial modifier
aux	auxiliary
complm	complementizer
mark	marker
prt	phrasal verb particle
purpcl	purpose clause modifier
rcmod	relative clause modifier

1.1 Adverbial Modifier

1.2 Auxiliary

1.3 Complementizer

1.4 Marker

1.5 Phrasal Verb Particle

The phrasal verb particle relation ties the head word of a phrasal verb to its particle. See Example 1.1.

(1.1) . . . the reduction of superfluous proteins will free up resources . . .

1.6 Purpose Clause Modifier

1.7 Relative Clause Modifier