

# Syntax

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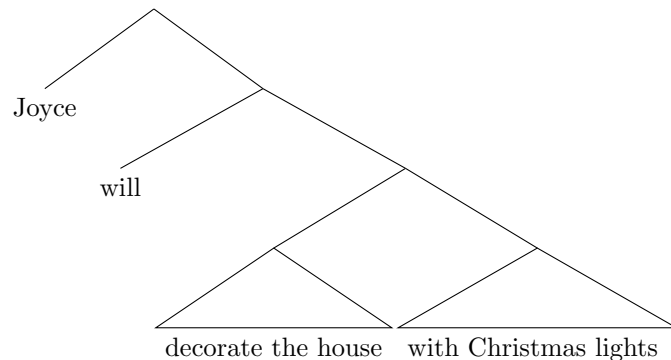
## 1 Ambiguity

We saw in the previous lecture that **compound words** can be **structurally ambiguous**. That is, a compound like *student essay critic* has two meanings because it has two possible structures: [ [ student essay ] critic ] vs. [ student [ essay critic ] ]. Sentences can be similarly ambiguous. Consider the following example:

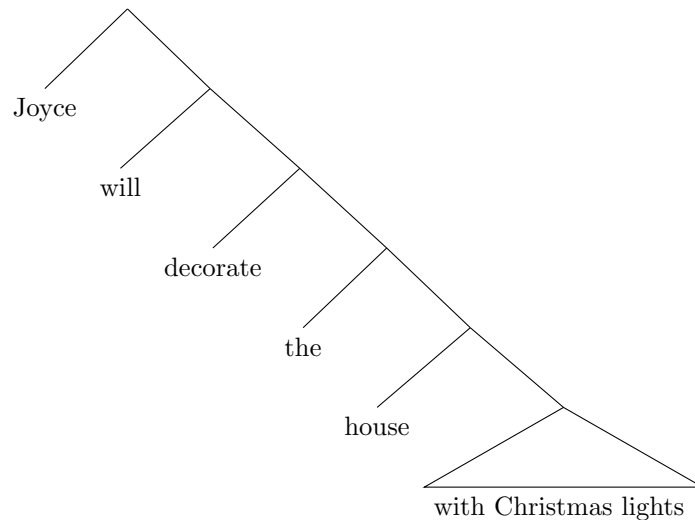
- (1) Joyce will decorate the house with Christmas lights

There are two possible interpretations of (1): ‘Joyce will use Christmas lights to decorate the house,’ or ‘Joyce will decorate the house that has Christmas lights (i.e., she will generally decorate the house that happens to have Christmas lights already)’. Importantly, this is NOT **lexical** ambiguity: it’s not that any of the individual words in the sentence in (1) has multiple meanings, thereby causing multiple meanings in the sentence. Rather, the culprit is the prepositional phrase *with Christmas lights*: is this phrase telling us how Joyce will *decorate the house*, or is it telling us something about the *house*? Intuitively, the interpretation of the sentence depends on what this prepositional phrase is “attaching to”. Roughly, this is the idea:

- (2) (1), Meaning 1: ‘Joyce will use Christmas lights to decorate the house’



- (3) (1), Meaning 2: ‘Joyce will decorate the house that has Christmas lights’



The ambiguity is the result of what words are forming a unit in the sentence. In (2), *decorate the house* forms a chunk, and *with Christmas lights* attaches to this to create the chunk *decorate the house with Christmas lights*. In (3), *house* and *with Christmas lights* combine to form the chunk *house with Christmas lights*. So what we need is a way of talking about which words form “chunks” or units in sentence.

## 2 Phrases/constituents

Let’s look at another example; one that isn’t ambiguous for ease of explaining.

- (4) This irresponsible scientist will blame that laboratory after this fiasco

Words combine to form a unit called a **phrase**. Before we start combining words into phrases, we need to know the **syntactic category** of each word in the sentence. Re-read the Syntactic Categories reading if you need a refresher!

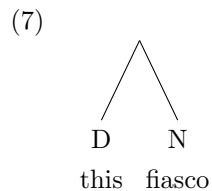
- |     |      |               |           |      |       |      |            |       |      |        |
|-----|------|---------------|-----------|------|-------|------|------------|-------|------|--------|
| (5) | D    | Adj           | N         | T    | V     | D    | N          | P     | D    | N      |
|     | This | irresponsible | scientist | will | blame | that | laboratory | after | this | fiasco |

I've labeled the auxiliary *will* as T for **tense**, because auxiliaries and tense are basically the same thing. Consider the sentences below:

- (6) a. \*The scientist blame the lab  
 b. The scientist will blame the lab  
 c. The scientist blames the lab  
 d. \*The scientist will blames the lab

In English, you need tense marking for the verb somewhere in the sentence, which is why (6a) is bad. One way to add tense is to add an auxiliary, as in (6b). But sometimes, the tense shows up as a suffix on the verb, as in (6c). Importantly, you cannot have BOTH an auxiliary and a tense-marking suffix in the same clause. This suggests that the auxiliary and the tense the marking suffix are really the same thing: both indicators of tense. So we will label auxiliaries as T when we draw the structure of sentences.

Let's start with some combinations of words that intuitively feel like a unit. For example, *this fiasco*. Let's isolate this chunk to see what kind of phrase it forms.



Like we did with morpheme trees, we're going to use a tree diagram to show the structure of phrases. So the determiner and the noun form a phrase together; the question is, what kind of phrase is it? We have two options. It's either a Determiner Phrase (DP for short) or a Noun Phrase (NP for short). Since we combined a determiner and a noun, we're going to make a simple assumption that this phrase has to be predominantly a determiner-like thing or predominantly a noun-like thing. How do we tell if this phrase is more determiner-like or noun-like? Well, let's see if the *this fiasco* behaves more like the determiner *this* or the noun *fiasco* in our sentence. In (8), I'm going to literally replace *this fiasco* with just the determiner first, and then replace the same phrase with just the noun to see which one sounds ok in English.

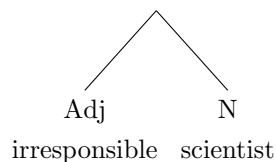
- (8) a. This irresponsible scientist will blame that laboratory after this

- b. \* This irresponsible scientist will blame that laboratory after fiasco

(8a) is pretty natural. (8b) is not something a native speaker of English would say. What this shows is that *this fiasco* behaves more like the determiner *this* than it does like the noun *fiasco*. So we're going to call the *this fiasco* phrase a DP, not an NP. This conclusion may seem odd to you at first, since non-linguists often call phrases like *this fiasco* a “noun phrase.” But we will actually see that these phrases are better described as DP's; NP's have different behavior.

So let's spot the NP's in the sentence. If we look at the noun *scientist*, there is a modifier in front of it telling you what kind of scientist: *irresponsible scientist*.

(9)



If I asked you if an *irresponsible scientist* should be an **Adjective Phrase** (AP) or a an NP, which would you guess? Right, it's an NP. *Irresponsible scientist* is certainly a “version” of the noun, *scientist*.

We've now outlined the intuition that **phrases** are the basic unit of syntax. Moreover, we have seen that there are intuitively different kinds of phrases as well. But how do we know that these are units in the first place, beyond our hunches? The next section will outline tests for figuring out which combination of words form what kinds of units in a sentence.

### 3 Substitution tests for constituency

We know that a word or a group of words in a sentence forms a unit if we can substitute it with another word without changing the meaning of the sentence. This unit is called a **phrase** or a **constituent**. It's kind of like how a group of people can be given a single name as a unit: like *NSYNC* as a name for the group Justin Timberlake, JC Chasez, Chris Kirkpatrick, Joey Fatone, and Lance Bass. Let's see how substitution works for linguistic units.

**NP substitution test** Let's start with where we left off: *irresponsible scientist*. An NP can be substituted with the word *one* (or *ones*, if the noun is plural):

- (10) a. This irresponsible scientist will blame that laboratory after this fiasco  
 b. (That irresponsible scientist won't blame that lab after this fiasco, but ...)  
 This one will blame that laboratory after this fiasco ← same meaning  
 as (10a)

The preceding context in the parentheses is just there to help you see that *one* is really making reference to *irresponsible scientist* (because saying "this one" out of the blue makes it unclear what the "one" is pointing to).

There are other words that substitute for *one* in this sentence: *scientist*, *laboratory*, and *fiasco*:

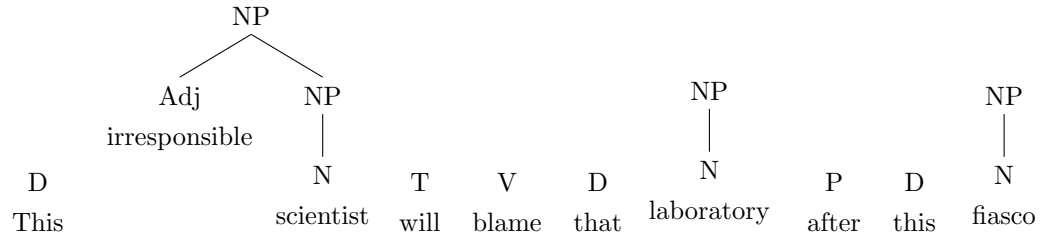
- (11) a. This irresponsible scientist will blame that laboratory after this fiasco  
 b. (There's an irresponsible scientist and a responsible scientist...)  
 This irresponsible one will blame that laboratory after this fiasco ← same meaning  
 as (11a)  
 c. (There's this laboratory and that laboratory...)  
 This irresponsible scientist will blame that one after this fiasco ← same meaning  
 as (11a)  
 d. (There's this fiasco and that fiasco...)  
 This irresponsible scientist will blame that laboratory after this one ← same meaning  
 as (11a)

Yes, a single word can be a phrase. So each of these nouns form an NP in the sentence:

- (12)
- |      |               |           |      |       |      |            |       |      |        |
|------|---------------|-----------|------|-------|------|------------|-------|------|--------|
|      |               | NP        |      |       |      | NP         |       |      | NP     |
|      |               |           |      |       |      |            |       |      |        |
| D    | Adj           | N         | T    | V     | D    | N          | P     | D    | N      |
| This | irresponsible | scientist | will | blame | that | laboratory | after | this | fiasco |

And we also know from (10b) that *irresponsible scientist* is an NP because it substitutes with *one* too:

(13)



**DP substitution test** We already saw some evidence that *this fiasco* is a DP earlier. A DP can be substituted with a pronoun like *it*, *this*, *that*, *they*, *them*, *he*, *him*, *she*, and *her*. In this case, *it* (or *this*) works as a substitution. The parenthetical context is there again to help you see that the substitution maintains the meaning of the original sentence.

(14) This irresponsible scientist will blame that laboratory after this fiasco

(15) (I will blame that laboratory after this fiasco, and...)

This irresponsible scientist will blame that laboratory after it (too) ← same meaning  
as (14)

There are more DPs in this sentence. *that laboratory* substitutes with *it*, and *this irresponsible scientist* substitutes with *he/she/they* (I'm using *he* here):

(16) a. (I will blame that laboratory after this fiasco, and...)

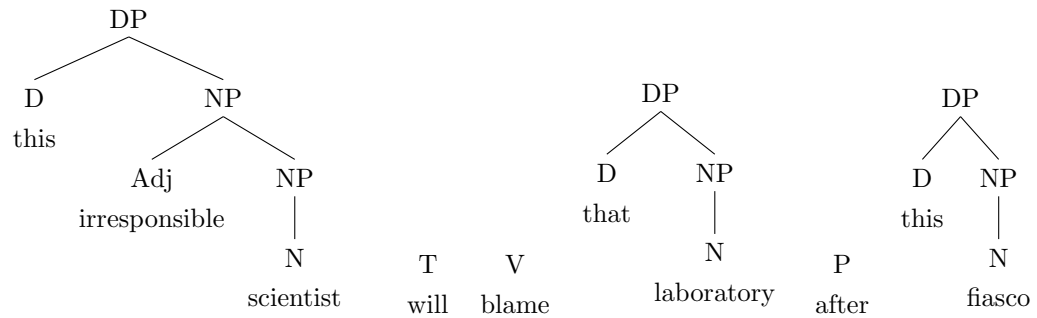
This irresponsible scientist will blame it after this fiasco (too) ← same meaning  
as (14)

b. (You see this irresponsible scientist?...)

He will blame that laboratory after this fiasco ← same meaning as (14)

So here's our structure:

(17)



**PP substitution test** Next, we have **Prepositional Phrases** (PP's). The phrase *after this fiasco* can be substituted with the word *then*: it's a PP.

(18) This irresponsible scientist will blame that laboratory after this fiasco

(19) (I will blame that laboratory after this fiasco, and...)

This irresponsible scientist will blame that laboratory then (too) ← same meaning as (18)

Other times, PP's can be substituted with *there*:

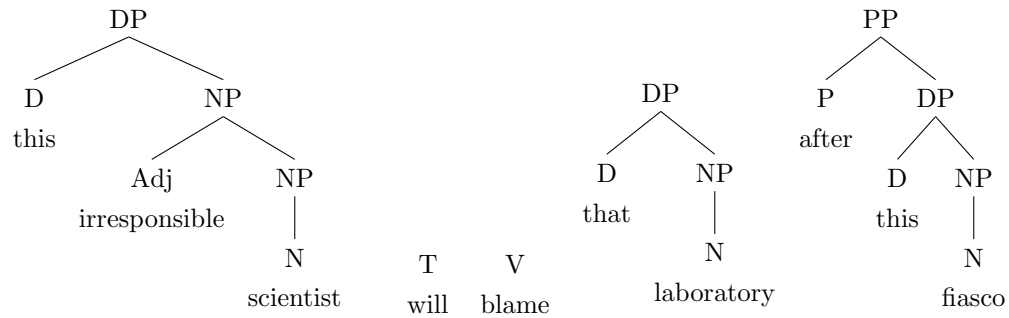
(20) This irresponsible scientist will go to the other dimension

(21) (I will go to the other dimension, and...)

This irresponsible scientist will go there (too) ← same meaning as (20)

This means we connect the preposition with the DP we formed earlier to create a PP in the tree:

(22)



**VP substitution test** Finally, we have **Verb Phrases** (VP's). VP's substitute with *do so*<sup>1</sup>. If the verb has present tense marking, it can be *does so*. In the past tense, it would be *did so*. Our first VP is *blame that laboratory*:

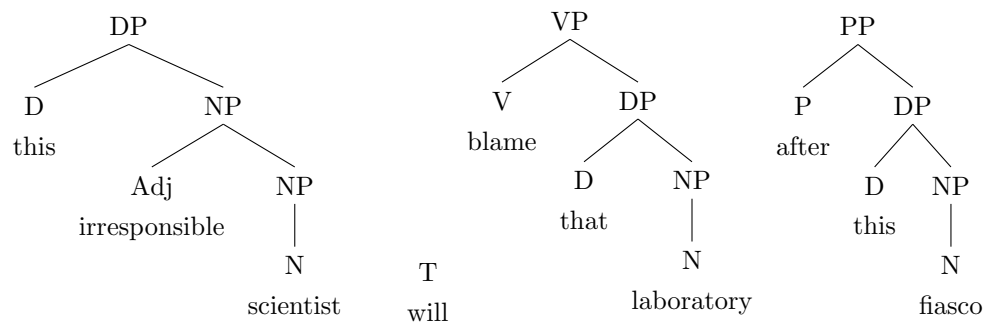
(23) This irresponsible scientist will blame that laboratory after this fiasco

(24) (I will blame that laboratory after this fiasco, and...)

This irresponsible scientist will do so after this fiasco (too) ← same meaning  
as (23)

So we connect the verb to the DP *that laboratory* to form a VP in the tree:

(25)



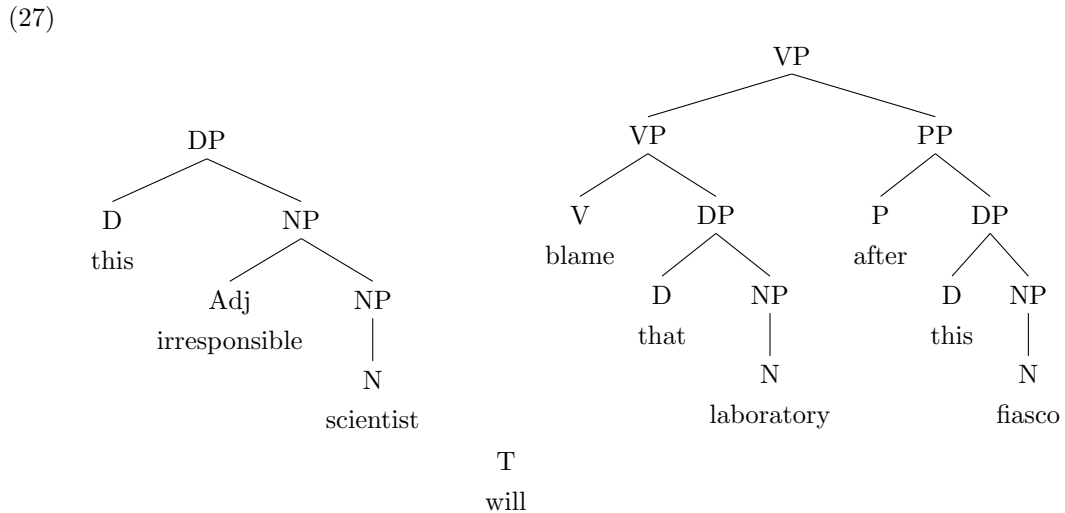
*blame that laboratory after this fiasco* substitutes with *do so* too:

<sup>1</sup>Technically not a single word substitution, but this is the closest we have!



- (26) (I will blame that laboratory after this fiasco, and...)  
 This irresponsible scientist will do so (too) ← same meaning as (23)

So we combine the VP we just formed with the PP to get one giant VP:



## 4 TP

We are almost done with the tree. The tense (auxiliary) must attach to something now. Intuitively, it feels like T should go together with the VP, since tense information is more closely tied to the verb than it is to the DP. There is not a good substitution test for this T + VP unit, but there's another way to show that things are a unit. Things that are of the same phrasal category can often be conjoined with the word *and*:

- (28) a. This irresponsible scientist and this cowardly assistant will blame that laboratory after this fiasco (DP and DP)  
 b. This irresponsible scientist will blame that laboratory after this fiasco and disappear from this town (VP and VP)

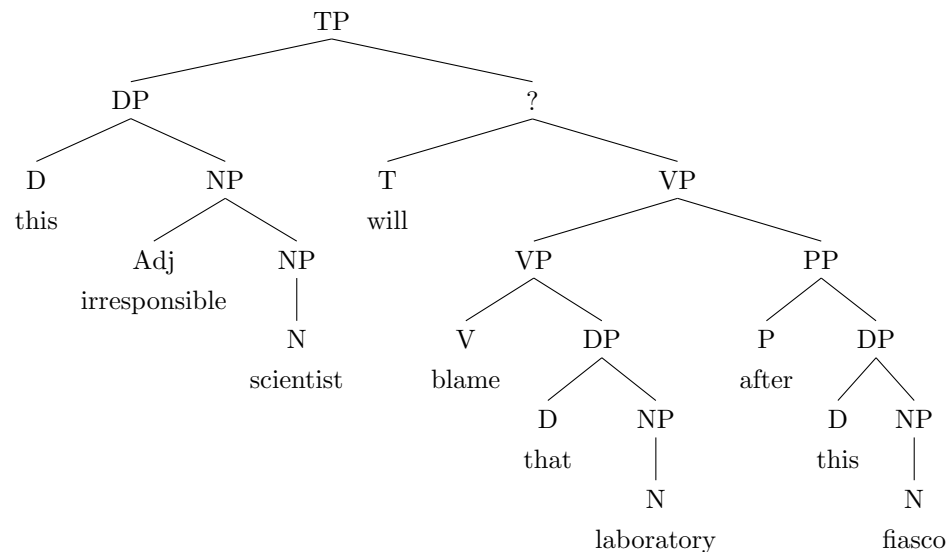
And we can see that *will blame that laboratory after this fiasco* can be conjoined together independent of the subject DP:

- (29) This irresponsible scientist will blame that laboratory after this fiasco and might disappear from this town

This suggests that it indeed is a unit. It's not a VP though, since it doesn't substitute with *do so* (or *does so* or *did so*) without changing the meaning of the sentence (cf., *\*this irresponsible scientist do so*).

Let's think about the entire sentence too. The entire sentence does not substitute with anything that we've seen so far either; it's not a DP, it's not a VP, and it certainly isn't an NP or a PP either. The entire sentence is a complete unit that contains the subject DP, the T, and the VP. We'll call this the TP:

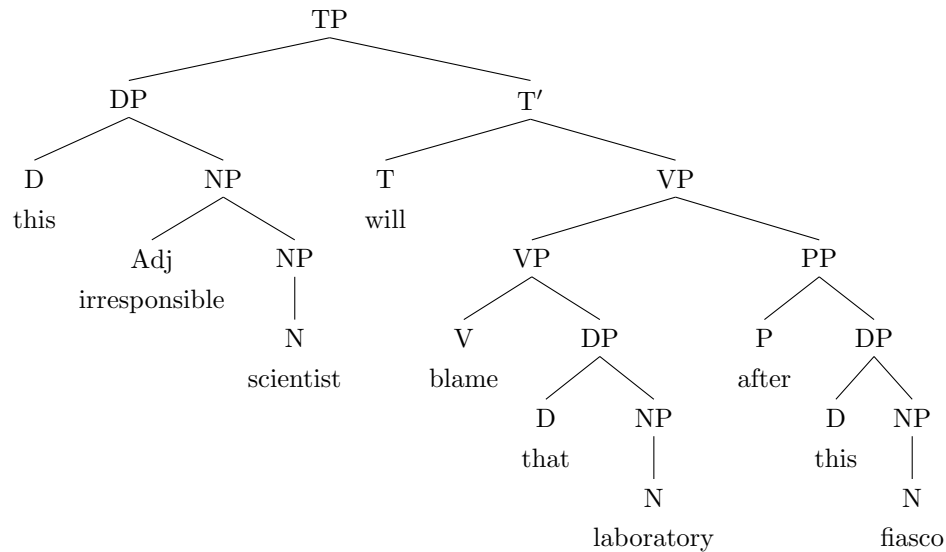
(30)



So what is *will blame that laboratory after this fiasco* (the unit currently indicated with “?”)? We’ve already decided that it’s not a VP, but it’s also not a complete clause like the TP (the entire sentence). We will introduce an **intermediate** phrase, called “T-bar”, written T’.

So here is our tree with the intermediate phrase:

(31)



Think of T' as an “incomplete” TP. A full clause ultimately needs two things to have a complete thought: the subject DP and a VP. The role of T' is to say, “I’m not done with this clause yet; I still need the subject.”

## 5 The Projection Principle

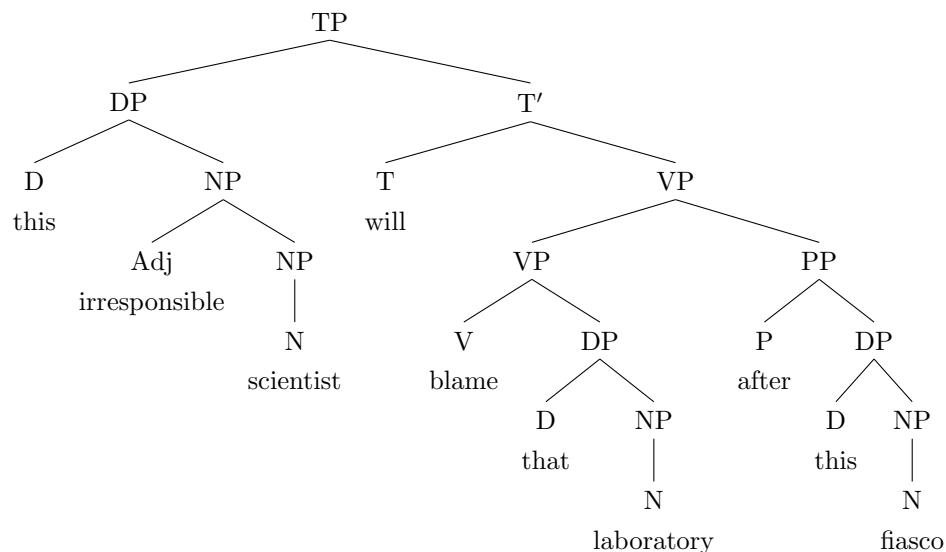
Looking at the tree we have so far, we can see that there is a relationship between a word category and a phrase: for every word category (like D, N, V, or P), there is a corresponding phrasal category (DP, NP, VP, and PP respectively). We say that the phrasal category (e.g., DP) is a **projection** of the word category (e.g., D). This relationship is a general principle called the **Projection Principle**. We can state it explicitly like this:

(32) Projection Principle

- (i) Every word of category X projects to at least one phrasal category XP.
- (ii) For every phrasal category XP there must be a single word of category X which projects to that phrase

... Hold on. Look at our tree again. There is one word category that violates the Projection Principle. Which is it?

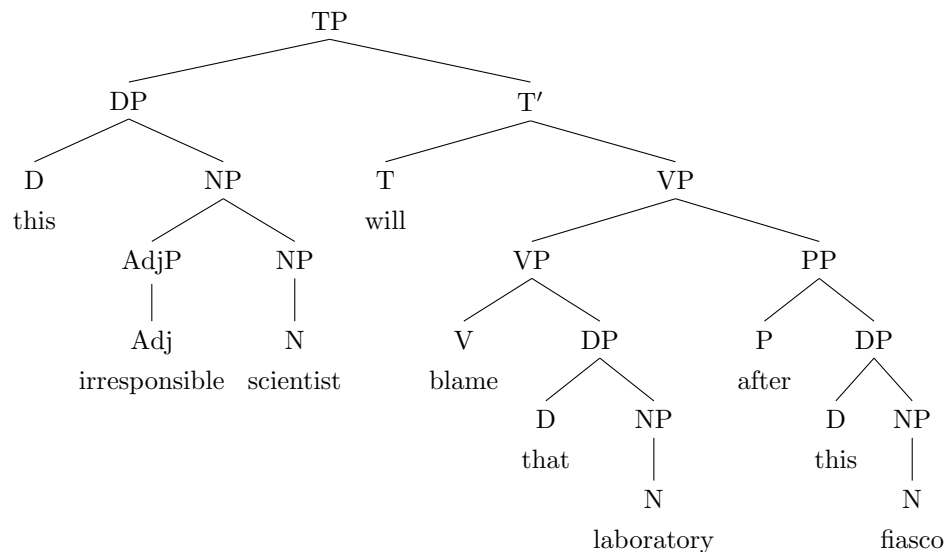
(33)



It's the adjective. Unfortunately, there isn't a good substitution test for AdjP's, but we will make the Adj project to AdjP to be consistent with the rest of the categories. The same holds for adverbs: Adv should always project to AdvP.

Here is the final tree for the sentence *this irresponsible scientist will blame that laboratory after this fiasco*:

(34)



## 6 Conclusion and caution

Be careful: what words form a constituent *depends on the sentence*. Just because *this irresponsible scientist* was a constituent in the sentence we used DOES NOT mean that it is ALWAYS a constituent. Consider the substitution tests below.

- (35) a. This irresponsible scientist from Hawkins will blame that laboratory after this fiasco  
 b. \*He from Hawkins will blame that laboratory after this fiasco
- (36) a. This irresponsible scientist from Hawkins will blame that laboratory after this fiasco  
 b. He will blame that laboratory after this fiasco

In this sentence (*This irresponsible scientist from Hawkins will blame that laboratory after this fiasco*), *this irresponsible scientist* does NOT pass the pronoun substitution test, therefore it is NOT a DP *in this particular sentence*. *This irresponsible scientist from Hawkins* is a DP in this sentence however, since it replaces with *he* without changing the meaning.

Now we have seen **compositionality** work at the sentence level: the meaning of a sentence arises as a result of combining the meanings of the words it contains in a particular way. There are phrases within phrases, and we have descriptive facts to support the presence of different kinds of phrases. In class, we will discuss further issues in syntax, including ambiguity, embedding, and unpronounced elements in syntactic trees.