A collection of

TOPIC GUIDES

for an introductory course in linguistics

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Contents

Change Log

v1.0 (15/04/2021): Original version posted

v1.1 (21/04/2021): Minor updates to text; fixed non-UTF-8 characters

Preface + Overview

This document is a compilation of weekly "topic guides" I wrote when teaching LING 100 *Introduction to Linguistics* in the 2020–2021 academic year at Queen's University, during the COVID-19 pandemic.

This was the first time I taught remotely, and the first time this course was offered remotely at Queen's. As others will remember, there was much emphasis in summer 2020—when many faculty were preparing to teach remotely for the first time—on the benefit of pre-recorded video content in "bite size" pieces, ideally 5 to 10 minutes, with a suggestion that students would be unlikely to focus for longer than that.

Taking this pedagogical advice seriously, I decided to virtually "flip" *Introduction to Linguistics*, pre-recording several shorter lectures each week and using shorter live classes (held via Zoom) for working on practice problems, holding group discussions, or fielding questions from students. Recognizing that students were located in many places, and might not have easy access to print versions of textbooks, I also adopted the open-access textbook *Essentials of Linguistics* textbook, created by Catharine Anderson, which presents much of its content in video form (though with transcripts available alongside the videos).

I had fully committed to making those videos, and yet I personally *intensely* dislike absorbing information from videos! So I resolved early on to *also* write "topic guides" to accompany the videos, covering the same content (with some additional topics covered only in writing), so that any students who also disliked videos could refer to written "lectures" instead.

Of course, I imagined that these topic guides would be written and posted well in advance of each week. In actual practice, they were mostly written in a rush at the start of each week, and thus often trail off or end abruptly at whatever point I felt I had covered the bare minimum of the relevant content. And yet, they were also substantially longer than I had expected—I was startled at the end of the year to realize that I'd written about 300 pages of content.

Given the time I'd put into them, it occurred to me that I might be in a position to save others similar labour. Despite their limitations, I hope that these notes might be helpful to others teaching similar courses in the future, or to anyone interested in adapting them. For this reason I am making them publicly available in lightly-edited form, licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 license.

In the process of converting the original files (written in MultiMarkdown and exported to HTML) into LaTeX, the topic guides have been lightly edited for formatting and consistency. Because they were written under considerable time constraints, however, many errors doubtlessly remain, both in the form of typos and perhaps in substantive content. Though I hope that I have not deeply misrepresented any groups or otherwise perpetuated harmful misinformation, I sincerely apologize if I have, and appreciate the time anyone takes to correct me. If I receive corrections of that kind, I will promptly remove or correct the relevant content.

To give some context on the course content: *Introduction to Linguistics* at Queen's University is a year-long introductory course in linguistics, which serves as a pre-requisite to subsequent theoretical courses in linguistics (phonetics, phonology, morphology, syntax, and semantics). It thus covers those core "language structure" areas of the field. Over the years, though, there's been recognition of a greater need to add more content in topics relating to sociolinguistics and linguistic justice to general courses in linguistics, not just in their own units but woven throughout course materials. These topic guides (and the accompanying lecture videos) represent a snapshot in my own work towards broadening the course content in that way, but they should not be taken as the endpoint by any means. The sections that do focus on topics in sociolinguistics or language policy are in many ways the weakest ones here, in my opinion, both because they reflect both the limits of my own knowledge in those areas, and because they're represented by a more patchwork assemblage of topics, as I work on identifying "key topics" to cover in an introductory course.

One unusual aspect of *Introduction to Linguistics* at Queen's—or at least a less common feature of its organization—is that it begins with Morphology and Syntax in the Fall semester, and only gets to Phonetics and Phonology in the Winter. These topic guides reflect that sequence of topics, so might need some adaptation for use in a course that reflects the more traditional smallest-units-to-larger-units sequence.

Finally, I want to gratefully acknowledge the support of the *Teaching in Linguistics: Community of Practice* (TILCOP), a group founded by Catharine Anderson in 2020 that brought together people teaching undergraduate lin-

guistics in Canada, to share advice and resources with one another as we all struggled with moving online. This group met remotely throughout the 2020–2021 academic year to discuss challenges and approaches for teaching remotely—and even as I post the first version of this document, the group is embarking on a project to revise and expand the *Essentials of Linguistics* textbook. Thanks to all the other members of that group, especially Catherine Anderson, Daniel Currie Hall, Julie Doner, Liisa Duncan, Meg Grant, Tim Mills, Nathan Sanders, and Ai Taniguchi.

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v1.1 Update (April 21, 2021): After the document was first posted, I realized that I had not caught all instances of Unicode characters that don't render in LaTeX(some IPA characters, accented letters, some Chinese characters, em-dashes in a couple chapters). These have now been fixed.

Also, expanding on the points above about what is *not* covered here: coverage of signed languages is quite sparse in this text, which is a significant omission, and an ongoing problem with a lot of intro linguistics courses (including my own). I encourage anyone using these notes to emphasize manual modalities in their teaching: one great resource for online or remote courses are the many YouTube videos on the structure of ASL created by Deaf linguists.

Finally, I realized that there's no up-front explanation of the yellow stars anywhere in the document! Any section whose title is preceded by a ⭐ is one that is not covered at all in the associated "content videos".

Video Access

This collection of topic guides was written to complement the first edition of the Essentials of Linguistics textbook by Dr. Catharine Anderson (McMaster University). That textbook includes videos for many of the chapters. When teaching the course for which these topic guides were written, though, I also filmed a series of "Content Lecture" videos.

The complete series of those video lectures is available (as of April 2021) on the Queen's Streaming Service, at: https://stream.queensu.ca/Playlist/IntroLingBjorkman

Videos range in length from 5 to 25 minutes. Currently they have automatic captions, but no human-edited captions. A few notes:

- No videos were made for the unit on Language Acquisition, which instead used existing videos created by the YouTube channel The Ling Space.
- No written topic guide was created for the last unit in the course, Language and Music (selected by poll by students, from among a number of possible topics).

In some cases the topic guides make reference to other videos, particularly the Crash Course Linguistics series (available on YouTube), or various bonus videos that were posted to the course Brightspace LMS. If you would like to know what videos were posted as bonus content, please contact me by email (bronwyn.bjorkman@queensu.ca).

Part I

Introduction

Chapter 1

Fall Week 1: What is linguistics?

Contents

1.1 Linguistics: the study of language

The textbook describes linguistics as the *scientific* study of language. That's true of many kinds of linguistics, including much of what we'll be studying in this course, but we can more broadly say that linguistics is simply the study of language.

In this course we're doing *formal linguistics*, which is part of the scientific study of language in the sense that it proceeds on the basis of testing hypotheses against available evidence.

Hypotheses must be *falsifiable*, which means that there's some evidence that would tell you if the hypothesis is incorrect. The evidence we'll be looking at mostly doesn't come from labs or what we traditionally think of as experiments—instead it comes from observed variation across human languages, and the judgements of native speakers about what's possible in their own languages.

1.1.1 So what is *language*?

If linguistics is the study of language, what is **language**? If you haven't thought about this before, take a moment now to try to come up with an answer (maybe write it down).

There are lots of things we sometimes mean by the word "language".

Sometimes by "language" we mean something like "system of communication". So we can talk about "body language" or "the language of flowers" or the "visual language" of a filmmaker or of a medium like comic books or video games. In linguistics we usually aren't interested in language in these senses (though some linguists study *gesture*, either on its own or as it relates to other aspects of language).

We might think that by "language" we mean something more specific. Sometimes people think of a language as represented by a dictionary, or a list of **words**.

But there's more to language than this: if you've ever studied a language in a class, you have to learn a lot more than a list of words. If you try to simply start from one language and do a word-by-word translation, the result is often gibberish. (In August 2020 there was a minor internet storm after it came out that most of the Scots Wikipedia was generated based on word-level replacements from English[1].)

The extra piece is that the words combine in particular ways—according to a system of rules that we usually call a **grammar**. In everyday use, by

[1] https://www.engadget.com/scots-wikipedia-230210674.html

grammar we often mean the "rules" for building "correct" words or sentences (see below for why "correct" is in scare quotes here), but in linguistics we also talk about grammar in relation to the sounds of a spoken language or signs of a signed language, what sounds are possible and how they can combine. This system is very complex—it takes a lot of effort for most people to learn a new language's system as an adult—but human infants are able to figure them out on the basis of what goes on around them.

This brings us to a final piece of what we're interested in in linguistics: language as a **human** ability. Linguistics is one of the fields in **cognitive science**—the interdisciplinary study of how the human mind works—and that's the perspective on language we'll be taking through much of this course.

So when we say that linguistics is the study of *language*, for the purposes of formal linguistics we mean that it is the study of the grammatical systems that underly the human capacity for a particular kind of communication.

1.1.2 Descriptive vs. Prescriptive

As mentioned above, when we think about *grammar* we often think of whether something is "correct" or not. You especially hear a lot about "bad grammar" or "incorrect pronunciations" of words. You've definitely heard something like this in your life—take a moment to think of an example or two.

This way of thinking about language is very common, and it's called a **prescriptive** approach to language. If we're prescriptive about grammar, we talk about how it should work or how people should talk—and that means we're applying some set of values the rates some grammatical options as better than the alternatives, or even as the best options.

By contrast, linguistics takes a primarily **descriptive** approach to language, which means that we are interested as scientists in describing how people *actually* speak and use language. It's only by studying how people actually speak that we can figure out how language works in the human mind!

When people talk about being "correct" or speaking "well", the value that we're assigning is usually, when you dig into it, that it's good to be white, to be highly educated, and to be wealthy—speech identified as "correct" is usually the speech of middle- and upper-class white people who've gone through a lot of formal education. This underlies a lot of the discourse around "standard" or "academic" language. Studying linguistics—as we'll see in this course—gives us an angle from which to see that no one accent or grammar is objectively better than any other, and no language is better

than any other. When we evaluate languages from this lens, we're often recreating racist or colonial value systems, and it's important to think about how to unteach ourselves those!

You'll often see linguists talking as though we should *never* be prescriptive about language. But this is an oversimplification, one that we often make because prescriptive views of language are so common, and so opposite to how we approach language in linguistics. But there are some values about language—some "shoulds"—that are worth being prescriptive about. So when people object to offensive language—for example, objecting to the use of slurs—they're being *prescriptive* about language, saying that you shouldn't talk a certain way, but based on the value of being respectful to people's identities and not expressing hateful or discriminatory views.

1.1.3 Individual vs. Collective

When we talk about **language** in everyday life, we also often talk about it in a collective sense. So we can talk about *English* as a whole, though it is spoken in many ways by many people. English doesn't exist "out in the world", though, so when we talk about English as a whole we're talking about something that exists across a community of speakers. We might think of this as a collective way of talking about language.

In linguistics we often talk about language in a more *individual* way: when we approach language as a cognitive science, though, we're less interested in the community-based collective sense of language than in how the human mind is able to learn and interact with language. In a sense, this kind of linguistics is both more general—we're trying to figure out how all minds work with respect to language, not just the minds of people who speak English—and more specific, because the way we investigate how all minds work is by seeing how individual minds work.

In LING 100 you'll often hear me talk about the properties of "my English", by which I mean the particular grammatical system that I developed as a child who grew up with people speaking English in my environment. Many parts of my grammar for English are likely to be the same as your

grammar for English, especially if you grew up speaking English in Canada, but some details are likely to be different. That's okay! The principles we figure out about how the human mind deals with language should be able to deal not only with my grammar for English, but with all the possible grammars, not just of English but of any human language.

1.1.4 Spoken and Signed Languages

Our focus in this class will be mostly on languages that are **spoken**: languages where we produce sound with our mouths (or more precisely, with our *vocal tract*), and perceive the resulting audio with our ears (or more precisely, with our *auditory system*).

But while they are a minority of the world's languages, there are also many languages that are **signed**: languages produced with the hands (as well as the body and face, usually), and perceived visually.

Signed languages are primarily—but not exclusively—used in Deaf communities (the capital D is used to specify that this refers to Deaf culture, rather than lower-case 'deaf' which identifies lack of hearing.) There are several signed languages used by members of the Deaf community in Canada, including ASL (American Sign Language) in most of anglophone Canada, and LSQ (langue des signes du Quebec) used primarily in Quebec. Two others that are spoken by some people are Maritime Sign Language[2], used mostly by older Deaf people in the maritimes, and Plains Sign Talk[3], an Indigenous signed language that was once used very widely through much of North America.

Maritime Sign Language was developed historically from British Sign Language (BSL), while ASL and LSQ are both derived historically from French Sign Language (langue des signes français, LSF). This highlights one important thing to remember about sign languages, which is that they are not just manual implementations of spoken languages! The grammar of ASL is very different from the grammar of English—but also very different from the grammar of French, despite its historical connection to LSF.

But a second important thing to know about signed languages is that they do have grammar, just like spoken languages do! Signed languages are not just "gestures" that reflect the physical world, any more than spoken languages are just onomatopoeia (words that imitate sounds)—though we do find words that reflect non-linguistic shapes or sounds in both types of languages.

[2] https://en.wikipedia.org/wiki/Maritime_Sign_Language
[3] https://en.wikipedia.org/wiki/Plains_Indian_Sign_Language

We will see some examples from signed languages as we move through various topics this year, but most of our time will be spent on spoken languages, partly because this class is taking place in English, a spoken language, and partly because most of the world's languages are spoken rather than signed.

Nicaraguan Sign Language

Nicaraguan Sign Language is a sign language that came into existence in the 20th century in newly-established schools for the deaf in Nicaragua. These school didn't use a sign language, instead choosing an "oralist" approach in which children are instead taught to lipread and use oral language (this approach has the serious problem that it denies children access to language: since deaf children can't hear, they can't get normal linguistic input if they're only exposed to spoken language, whereas the use of signed languages would allow deaf children to develop normally).

The first generation of children in these schools brought with them what are called *home sign* systems—sets of signs used in a family, but that don't typically exhibit the full grammatical complexity typical of natural languages. Younger children who grew up in the schools developed these systems into a totally novel language, what became Nicaraguan Sign Language.

What this demonstrates to linguists is that human children don't need perfect exposure to a complete language in order to acquire a grammatical system. Instead, children take what they encounter in their environment and *build* a grammatical system that's consistent with it.

If you're interested in reading more about Nicaraguan Sign Language, here are some links:

- How Deaf Children in Nicaragua Created a New Language[4]
- The video posted in the "Bonus Content" section

[4] https://www.atlasobscura.com/articles/what-is-nicaraguan-sign-language

- Nicaraguan Sign Language (Wikipedia)[5]

1.2 Human Capacity for Language

We're interested in human languages, and the cognitive capacity for language that's characteristic of humans. It's useful to start by talking about the characteristics that distinguish human language from other systems of communication.

We can talk about this in terms of **six properties** that characterize the grammars of human languages:

1.2.1 The grammar of human language is generative and creative.

This property is so important it gets its own section in your textbook! When we talk about grammar being generative we mean that whatever system we have that allows us to use and understand language, it's able to generate a potentially infinite number of sentences. We might express this as grammar being creative, but here we don't mean "creative" in the artistic sense (though that can be true as well!) but in the sense that a language's grammar can create new words and sentences, ones that have never been used before.

Approaches to linguistics like the one we're taking in this class, approaches the focus on this generative property, are often referred to as *generative theories* or *generative linguistics*.

1.2.2 Our knowledge of grammar is unconscious

We use language all the time—you're using language right now in order to read these words!—and so in one sense we obviously know how it works. But if someone asked you why the word order in English is Subject-Verb-Object, you wouldn't (necessarily) be able to tell them why, or be able to explain the exceptions that sometimes arise—in fact, you might not be certain what "subject", "verb", and "object" mean, even though you're a perfectly fluent speaker of English!

It's in this sense that our knowledge of grammar is unconscious—it's below the level of conscious thought. What we're doing in linguistics is building a conscious theory of this unconscious system, much as we might

[5] https://en.wikipedia.org/wiki/Nicaraguan_Sign_Language

study the mental and physical systems underlying things like our ability to walk and keep our balance, or our ability to recognize faces.

Conscious vs. Unconscious Knowledge

This is a useful place to draw a distinction between the unconscious knowledge of grammar that we all have, the knowledge that allows us to speak a language, from the conscious knowledge that allows us to read and write.

While humans naturally learn the language spoken (or signed) around them as children, without needing to be explicitly taught, the same isn't true of reading and writing. While some children learn to read and write on their own—or at least early enough that they don't remember learning—many or most need to be explicitly and consciously taught how to read and write.

So whatever our human capacity for language involves, it's not built for written language—indeed, linguists and other people who study writing often describe language as a **technology** that we invented, and that we learn to use like other tools.

For this reason, in linguistics classes we are mostly not interested in writing or spelling, which are the product of conscious learning, as much as we're interested in how people naturally speak and pronounce things. It's only the latter that reflect the unconscious system that our mind uses to generate language.

1.2.3 Grammar is general: all languages have it.

In the discussion above of signed vs. spoken languages, I said that signed languages have grammar just like spoken languages do. This is more general: **all** human languages are systematic, and are governed by a set of rules.

These aren't necessarily the type of rules that we think of as "grammar", or "good grammar", in a prescriptive sense—they're like the rules of physics, rather than the rules of etiquette.

Not only all languages but all varieties of all languages have grammar. Even casual "slang" ways of speaking, which are often viewed as lazy or sloppy, are systematic in this sense. As a simple example, consider the word "like". It's common to hear complaints that younger English speakers "say 'like' too much"—people get very worked up about this! But as Professor Alexandra D'Arcy discusses in her book 800 Years of LIKE (https://benjamins.com/catalog/slcs.187) "like" has a very long history in English, and its use has always been systematic.

What complainers seem to react to is people doing things that are generated by their grammars but that aren't possible in the complainers' grammars. And then people skip over "your grammar must be different from mine, interesting!" and instead go straight to "you must not have any grammar." This often reflects other attitudes about language, or about the speakers of language.

1.2.4 All grammars are equally valid and equally expressive.

Not only do all languages *have* grammar, all grammars are equally **valid** and equally **expressive**. This contradicts some of the ways non-linguists think and talk about language. People often talk about not liking the "sound" of a particular language, or say that people who speak a particular language, or a particular variety of a language, should learn to "speak properly" (which often means "speak more like I do"!).

But despite these prejudices that people hold about some languages and varieties, all languages are equally valid, equally valuable, and equally expressive! And while languages might encode information differently, every language can express equally complex ideas.

You'll often see articles listing "untranslatable" words. Here's a Google search that turns up dozens of them[6]. But notice that though these lists of words don't correspond to *single* words in English, all of these articles do actually translate all the "untranslatable" words they list! It's just that the translation into English might be longer, might take a sentence or even a paragraph.

This illustrates the fact that though languages don't always encode meanings in the exact same ways, they can still express the same ideas.

[6] https://www.google.com/search?q=list+of+untranslatable+words&oq=list+of+untranslatable+words&aqs=chrome..68

1.2.5 There are some universal properties that all grammars have.

One of the major insights of modern linguistics is that when we look across all the world's languages, we find lots of differences in their grammatical systems, but also some **universal** properties.

These universal properties come in at least three types:

- Things that **all** languages do
- Things that **no** languages do
- Implications: if a language does **A**, then it will also do **B**

Let's start with examples of things that **no** languages do. If we think of language as a string of words, or a string of sounds, then there are lots of ways of manipulating those strings that we could describe. If you're familiar with data structures in computing, or with computer programming, you might have thought about the kinds of operations we can apply to strings. A very simple string operation is to take all the words in a sentence and put them in reverse order. It is very simple to tell a computer to do this!

If we look at questions in English, starting with extremely simple examples, we might form the **hypothesis** that you form questions by taking the string of words in a statement and putting them in reverse order (or vice versa: that you turn questions into statements by reversing the words):

- Did they?
- They did!

But this hypothesis falls apart as soon as we look at any sentences longer than two words:

- Did they really do it?
- * It do really they did!

In linguistics we are often interested in things that *aren't* possible as much as in things that *are* possible. We mark things that aren't possible (in a particular grammar) with an asterisk '*'. The asterisk means "not possible in this grammar" (or "not grammatical" in the linguistic sense of "grammatical")

So it turns out that we don't form questions in English by putting words in reverse order—in Week 7 we'll see that the correct generalization involves reordering the subject and what we call the auxiliary verb, but you don't need to worry about that for now.

Not only that, but if we look at all the languages spoken by humans, it turns out that there's **no** grammatical process in the world's languages that involves taking the words in a sentence and putting them in reverse order.

Why is that interesting? Because it tells us something about the human mind, and the human language ability. However language works, or however the mind deals with language, it doesn't look like a computer processing strings.

This brings us to something that **all** languages do: all languages care not about strings but about **structures**. This is something we'll talk more about in both morphology and syntax.

Universal Categories?

In one of the videos for this week I mention the debate about whether all languages have *nouns* and *verbs*. What does the evidence in that debate look like?

In Salish languages, words (or *roots*, see our next unit on morphology) that are translated as verbs or as nouns in English can all appear in

the same kinds of positions in sentences. In the following example from Sḵwx̱wú7mesh sníchim (Squamish), spoken in British Columbia, the same marking *=as* can be attached to a root meaning "arrive" and a root meaning "cat", marking that there is a third person singular subject and that the mood is subjunctive.

(1) ƛ'iq'=as
arrive=3subj.subjunctive
"if he/she/it arrives..."

(2) pùš=as
cat=3subj.subjunctive
"if he/she/it is a cat..."

(Examples from Kuipers 1968 "The categories verb-noun and transitive-intransitive in English and Squamish." *Lingua** 21 p. 622[7])

Some people argue therefore that labels like "noun" and "verb" aren't relevant for such languages, and therefore that it is **false** that all languages have nouns and verbs.

Other people agree that this shows something more complex, that we were wrong to think of "noun" and "verb" as universal properties of *roots*, but that all languages still make use of these categories in their morphology and syntax—when putting words and sentences together.

This is a subtle debate, and one we won't engage with in LING 100! But it's an example of the type of questions that we can ask about language universals.

1.2.6 Grammars are mutable: all languages change (and that's okay!)

Finally, the grammars of all human languages are **always changing**, at least so long as they're actively spoken and used. A fancy way of saying this is that grammars are **mutable**.

What this means is that there's no stable "way things are" for a language. Just because English worked a certain way 100 years ago, that doesn't mean it works the same way now (in fact, it definitely doesn't). As people studying language, this is exciting! It means that even if we somehow learned everything there was to know about every language spoken today—which

[7] https://doi.org/10.1016/0024-3841(68)90080-6

is already impossible, given that there are over 7000 languages spoken in the world, before we even start counting different varieties of some of those languages—we would still have new things to investigate as those languages underwent changes!

Language change comes inevitably from language use—and from the process of children acquiring languages. Each generation changes the language just a bit, and those changes accumulate over time.

The only languages that don't change are languages that aren't being spoken any more—or if they're spoken, they're spoken only by people who consciously learned them as adults. Latin is a good example of this: Classical Latin is something you can study in school, and the version of Latin that you learn today is basically the same as the Classical Latin people have learned for generations. But Latin the **living** language, as it was spoken in the Roman Empire, didn't stay the same: it divided into different dialects, and those dialects kept changing until they became the modern Romance languages: French, Spanish, Portuguese, Italian, Romanian, etc. And those languages are still changing today!

1.3 Universal Grammar and the logical problem of language acquisition

"Universal Grammar" is a term you might have heard applied to particular theories of linguistics. A more neutral term for basically the same idea is "linguistic nativism". Both of these refer to the hypothesis that the human mind has some **innate** or **built-in** grammatical capacity, which is what allows human children (but not animals or computers) to learn a natural language.

The argument for linguistic nativism is based, in part, on the observation of language universals, and partly on a logical argument about how language acquisition works. This logical argument is called various things, including "the logical problem of language acquisition", "the poverty of the stimulus argument", and sometimes "Plato's problem." Here we'll call it **the logical problem of language acquisition**

1.3.1 The logical problem of language acquisition

- **Premise 1:** Human languages have generative grammars.
  (This is *generative* in the sense discussed above: the grammars of hu-

man languages can generate a potentially infinite number of grammatical sentences.)

- **Premise 2:** It is not possible to deduce a generative grammar from a finite set of grammatical sentences.
  (This is a mathematical claim about the learnability of certain systems; we won't go through the proof here.)

- **Premise 3:** The only evidence available to children is a finite set of grammatical sentences.
  (After all, no matter how many sentences a child hears, there is no way for them to hear an *infinite* number of sentences!)

- **Premise 4:** Children do acquire the grammars to which they are exposed! (This premise is often assumed, rather than stated directly.)

If we accept all these premises (and some of them are debated), then we arrive at the following conclusion:

- **Conclusion:** Children must have access to more than just external evidence in order to acquire the grammars of languages in their environment.

The question is what the "more" is. We could imagine some ridiculous possibilities! Maybe children are visited in the night by a helpful language fairy who teaches them grammatical generalizations! :)

More seriously, **linguistic nativism** is the hypothesis that the "more" that children bring to the task of language acquisition is something that is (a) specific to language, and (b) inbuilt in the human mind. So it's some cognitive capacity unique to humans, and specific to language—this cognitive capacity is what is sometimes also called **Universal Grammar**, because it underlies the grammars of all natural languages.

1.3.2 Being a "native speaker" of a language

In linguistics, we are interested in the languages that humans speak naturally, without conscious learning or explicit instruction. What this means is that we are often specifically interested in **native speakers** of a given language—people who grew up speaking that language.

So for example, if we're talking about English, we'll often be primarily interested in the **intuitions** or **judgements** of people who grew up speaking English. This means their sense—the expression of their unconscious

knowledge of the grammar—about whether something is possible or not according to their grammar. We'll refer to things that speakers accept as **grammatical** for that speaker, and things that speakers don't accept as **ungrammatical** for them. And native speakers will sometimes disagree with one another, because they have slightly different grammars!

This isn't to say that people who learned English later on don't speak it well, or don't speak it fluently! But when we look at second-language speakers of any language, it's harder to tease apart what aspects of their grammatical system come from the human cognitive capacity for language, and what aspects come from conscious learning of the type we do in school.

And the same is true for every other language we discuss in class: while I'll sometimes bring in examples from languages that nobody in the class speaks, the examples will always be based on the intuitions and judgements of *someone* who's a native speaker of the language in question. And if I ever give an example from a language that you speak, and that you don't agree with, please let me know!

1.4 Reconciliation and Linguistics

The language we'll see examples from most often in this class is **English**, because this is the language that we all have in common, since Queen's is an English-language institution. We'll also often see examples from French, since many people in this class know French, and some people speak it as a first language.

English and French are both colonial languages, both globally and in Canada. This means that they were imposed around the world in the context of colonization.

English and French have displaced other languages around the world. It's important for us to recognize that this displacement didn't just happen, but was the result of active government policies that sought to establish the dominance of colonial languages and colonial society. As many of you know, residential schools—schools that Indigenous children were required by law to attend—were established early in Canada's history with the explicit goal of replacing Indigenous cultures and ways of life with the European majority. This happened not only in Canada, but in other colonial nations like Australia and the United States. And it is not something that ended in the distant past: the last residential school in Canada, located in Saskatchewan, only closed in 1996.

Language isn't just incidental to this history, it's an integral part of it. At residential schools Indigenous children were typically not permitted to speak their languages, and could be beaten or otherwise punished if they spoke a language other than English (or French). This played a significant role in the decline in the number of speakers of Indigenous languages in North America, many of which are now endangered, or no longer spoken at all by any living people.

But despite this history, Indigenous languages **are** still spoken by communities in Canada. Here in Kingston, the Indigenous languages that are spoken are Anishinaabemowin (also known as Ojibwe) and Kanien'kéha (also known as Mohawk); Anishinaabemowin is spoken by about 28,130 people in Canada, while Kanien'kéha is spoken by about 2,350 (numbers from the 2017 census[8]).

Canada is constitutionally a bilingual country, with official languages of English and French, but there is growing recognition that the Indigenous languages spoken here are equally part of our heritage as a country. This is one of the reasons that we'll draw examples from Indigenous languages when possible in this class, to help us all gain an appreciation for these languages and the cultures they're a part of—though since this is a class in mostly formal theoretical linguistics, our interest in particular examples will similarly focus on their abstract grammatical structures.

Like many other academic fields, linguistics itself has also often acted badly in its interactions with Indigenous people and their languages. The relationship between academia and Indigenous communities has often been *extractive*—with researchers coming in to study something of interest, and then leaving with physical goods or with knowledge without any exchange with the community or without their consent—or *paternalistic*—with researchers coming in to "solve" problems without consulting about the communities needs or goals first. In the case of linguistics, the extraction has historically been in the form of stories or texts, or in the form of grammatical descriptions that have been used to inform linguistic theories even while the language that was described lacks resources and is endangered. Paternalism has come from linguists who have sometimes tried to create resources or work on language revitalization without asking what the communities needs and priorities for resources and revitalization might be.

This history forms the backdrop to our discussion of Indigenous languages in this class. It also illustrates the real-world consequences of at-

[8] https://www12.statcan.gc.ca/census-recensement/2016/as-sa/98-200-x/2016022/98-200-x2016022-eng.cfm

titudes towards different languages and towards linguistic diversity. This is one of the reasons that we emphasize that **all languages have grammar** and that **all grammars are equally valid and expressive**—no language or variety of a language is "worse" than any other—but it's also important to emphasize the **value** of all languages. Our general capacity for language is part of what makes us human, in a very general way: any human child can learn any language equally well, as long as they hear it while they're growing up. But language is also an inextricable part of human cultures in a *collective* sense: while all languages are equally valid and expressive, a given language can nonetheless be unique in its relationship to a particular culture.

This is true of Indigenous languages, of English and French, and of all other languages spoken in Canada—and around the world! As we proceed through this course, even when we're talking mostly about the abstract grammatical structure of languages, you might keep this context in the back of your mind and ask yourself (or me!) about where particular languages are spoken, who speaks them, and where the examples we discuss come from.

Part II

Morphology

Chapter 2

Fall Week 2: Morphology, the study of words

Every section with a ★ in front of it has content that doesn't appear at all in the video lectures.

Contents

2.1 Morphology: the study of words

In linguistics, morphology is the study of *words*. So to understand what morphology is, we first need a working definition of what a word is.

This is actually a hotly debated topic! There are many contexts in which we might talk about a "word" in linguistics, and often the definition that works well in one context doesn't work quite so well in another. So linguists will talk about *phonological words*, *morphosyntactic words*, *prosodic words*, etc.

Fortunately, for the purposes of introductory morphology we can get by with a fairly straightforward definition of what a word is: **a word is the smallest separable unit in language**.

What this means is that a word is the smallest unit that can stand on its own—for example, content words (Nouns, Verbs, Adjectives, and Adverbs) can stand by themselves as one-word utterances when you're answering a question:

(1) a. What do you like to eat?
ANS: cake (N)
b. What did you do last night?
ANS: sleep (V)
c. What colour is the sky today?
ANS: orange (Adj)
d. How did you wake up this morning?
ANS: reluctantly (Adv)

Words are also *syntactically* independent: they can appear in different positions in a sentence, and can even "move around" when we transform one sentence into another (for example, turning a statement into a question.)

2.1.1 From *words* to *morphemes*

Words aren't the smallest unit of language, though. Words themselves can have smaller pieces inside them.

For example, the word ***books*** has two pieces inside of it: *book*, which has a meaning we might find in a dictionary (or which we could represent in a picture: 📖), and *-s*, which indicates **plurality**, i.e. having more than one of something.

The term **morpheme** refers to the smallest possible pairing of both form (or sound) on the one hand, and meaning or grammatical function on the other. (We say "grammatical function" because it's hard to pin down a clear meaning for some morphemes, but they're still doing some grammatical work.)

Words that contain more than one morpheme are **morphologically complex**. Words with only a single morpheme are **morphologically simple**.

The word *morphology* is itself morphologically complex, being made up of *morph-* "shape" and *-ology* "study of". So *morphology* is the study of shapes, in linguistics of **word** shapes.

2.1.2 Some terminology

Some morphemes are **affixes**: they have to attach to something.

The thing an affix attaches to is called a **base**. Some bases are morphologically simple, while others are morphologically complex.

For example, consider the word *librarian*. This word is formed by attaching the affix *-ian* to the base *library* (we can ignore the fact that the 'y' turns into an 'i', that's just a convention of English spelling).

Librarian can then itself be the base for another affix: for example, the word *librarianship*, the state or role of being a librarian, is formed by attaching the affix *-ship* to the base *librarian*.

There is a special name for simple bases, though. These are **roots**. A root is the smallest possible base, which cannot be divided, what we might think of as the core of a word.

Turning back to affixes, an affix is any morpheme that needs to attach to a base. We use the term "affix" when we want to refer to all of these together, but we usually specify what *type* of affix we're talking about when possible.

The types of affixes are:

Prefix: an affix that attaches **before** its base

Suffix: an affix that **follows** its base

Circumfix: an affix that attaches **around** its base

Infix: an affix that attaches **inside** its base

The textbook gives an example of an infix from Tagalog. An example of a circumfix, as well as examples of other morphological processes, appear in the next section.

Finally, we can divide morphemes by whether they are **free** or **bound**. A **free** morpheme is one that can occur as a word on its own. A **bound** morpheme, by contrast, can only occur in words if it's accompanied by one or more other morphemes.

Because affixes definitionally need to attach to a base, only **roots** can be free. Indeed, most roots in English are free, but we do have a few roots that

can't occur on their own. The example given in the content lecture video is the root *-whelmed*, which occurs in *overwhelm* and *underwhelmed*, but can't occur on its own as **whelmed*.

By contrast, in many other languages all (or most) roots are **bound**, because they always have to occur with at least some inflectional morphology. This is the case for verbs in French and the other Romance languages, for example. See the content lecture video for a specific example from Spanish.

2.1.3 ⭐ Illustrating types of affixation, and other morphological processes

An example of a circumfix can be found in the marking of **plural possessors** in many Algonquian languages. The following examples are from Meskwaki, spoken in parts of the Midwest of the US and in Northern Mexico; the source of these examples is Oxford (2020), who adapted them from an in-preparation grammar by Amy Dahlstrom (*A grammar of Meskwaki, an Algonquian language*).

(2) ne-ta·nes-aki
1-daughter-AN.PL
"my daughters"

(3) **ne**-ta·nes-**ena·n**-aki
1-daughter-**1PL**-AN.PL
"our daughters"

These examples have **morpheme-by-morpheme glosses**, which means that the morphological analysis has been done for you! The analysis that produces glosses is done using the same kind of techniques we'll practice for finding morphemes in an unfamiliar language.

The morpheme-by-morpheme glosses use standard abbreviations:

- **1** stands for "first person" (I, me, my /we, us, our)
- **pl** stands for "plural" (so **1pl** means "we, us, our")
- **an** stands for "animate". Algonquian languages distinguish all nouns as "animate" or "inanimate", and this is reflected in agreement.

What you can see here is that the singular possessor in "my daughters" is marked only by a prefix, but the plural possessor in "our daughters" is marked by the combination of the prefix *ni-* and the suffix *-ena·n*—or, in other words, by a **circumfix**.

Finally, a type of affix that signed languages have but that spoken languages (mostly) don't have is a **simultaneous affix**.

Because you can't produce two sounds with your mouth at the same time, it's difficult for an affix to be *simultaneous* with its base when you're speaking.

But when signing, it's possible to do things with multiple articulators (a second hand, or your face), or to add motion on top of a sign.

- Here's a very short video discussing some examples of simultaneous signs in ASL.[1].
- And here's one that teaches Yes-No Questions in ASL, which involves non-manual signs of raised eyebrows and forward head tilt held through what would otherwise be a statement.[2].

There are some things that we might think of as similar in spoken languages, once we have the example of signed languages. For example, languages with **tone** sometimes have **tonal morpheme**, that are overlaid on the consonants and vowels of a word.

English isn't a tonal language, but we have some morphological pairs that are related by **stress shift**, which we might think of as similar. These are noun-verb pairs where the noun has stress on the first syllable, but the verb has stress on the second syllable.

- They used to use **ré**cords to re**córd** music.
- I have a **pér**mit that per**míts** me to drive.
- I receive mail at my home **ádd**ress, at least when it's add**réssed** properly.

Not all English speakers agree about the pronunciation of all of these words—many people pronounce *address* with stress on the second syllable in the noun as well as in the verb, for example.

Finally let's talk about two types of morphological processes that (arguably) don't involve affixation at all: **internal change**, **suppletion**, and **reduplication**.

Internal change is one name for the type of change found in many **irregular** English noun plurals and verb past tenses.

[1] https://youtu.be/ezWqESHHwEo
[2] https://youtu.be/yajXAiwMRto

For example, the plural of *mouse* is *mice*; the plural of *goose* is *geese*. The past tense of *sit* is *sat*; of *write* is *wrote*

These are all relics of what used to be a regular pattern in English—by **regular** we mean that they were predictable based on the general pattern of the language. Now they have to be memorized, and are therefore **irregular**.

There are still productive alternations like these in other Germanic languages, like German!

Suppletion is an even more irregular pattern, where a particular morphological form involves entirely *replacing* the base. For example, the past tense of the verb *go* is *went*—there is no amount of affixation or internal change that will get you from one to the other! This type of total replacement is also found in the comparatives and superlatives of *good* ~ *better* ~ *best* and *bad* ~ *worse* ~ *worst*, throughout the paradigm of the verb *to be*, and on some pronouns.

If a language has suppletion (not all languages do!) these are the usual words that show it (along with verbs like *have* and *come*), because they are among the most common words in a language. The reason for this is that children acquiring a language tend to assume patterns are regular and rule-governed until the weight of the evidence convinces them otherwise—they're more likely to get enough evidence to reach the conclusion that something is irregular or requires suppletion if a word is incredibly common!

Finally, **reduplication** involves repeating part or all of a word as part of a morphological pattern. For example, Shaw (2004) gives the following examples of total reduplication in Halkomelem, a Salish language spoken in British Columbia, where it attaches to verbs and carries the meaning that something is disposed to the verb:

(4)	a.	[k'^{w}ə́ɬ]	'to capsize'	→	[k'^{w}ə́ɬk'^{w}əɬ]	'likely to capsize'
	b.	[q^{w}él]	'to speak'	→	[q^{w}élq^{w}el]	'talkative'

English does have one pattern of reduplication, but it can apply to phrases as well as words. This type of reduplication carries the meaning of something being a prototypical example of the type; it is often called *salad-salad* reduplication ("Tuna salad is a salad, but it's not a *salad-salad* "), but I think of it as "Do you like them, or do you *like them*-like them?" reduplication.

2.1.4 Allomorphy

Some morphemes have a consistent meaning, but change slightly in their form depending on the environment in which they occur.

The textbook discusses this for the plural suffix. Another example can be seen in the relevant content lecture video, for the negative prefix *in-*.

When a morpheme can be realized in more than one way, we refer to its different forms as **allomorphs** of the morpheme.

2.1.5 ⭐ Morphological typology

Looking at different languages, we can divide them **typologically** into different morphological types.

At one end we have what are called **isolating** or **analytic** languages. No human language is *totally* isolating—this would be a language where **all** words are morphologically simple. Chinese languages like Mandarin are highly isolating, because in these languages inflectional information is expressed by small function words ("particles") rather than by affixes. However there are nonetheless many compound words in the language.

English is less isolating than Mandarin, but still very analytic. We have very little inflectional morphology, but we do have derivational morphology, and very productive compounding.

The opposite of analytic is **synthetic**. Synthetic languages have a lot of morphological complexity in words, and are often characterized by having no (or very few) free roots.

Languages that are more synthetic fall into different types. The main division is between **agglutinative** and **fusional** languages. In highly **agglutinative** languages, words are built from many easily separated affixes, each of which is associated with a consistent piece of meaning. Japanese is a somewhat agglutinative language, as in the following example where the verb has a string of suffixes corresponding to the English passive ("was *verb*-ed") and causative ("made X *verb*")

(5) Watashi-wa nattō-o tabe-sase-rare-ta
I-TOPIC sushi-ACCUSATIVE eat-CAUSATIVE-PASSIVE-PAST
"I was made to eat natto."

By contrast, a **fusional** language is one where many inflectional meanings are combined into single affixes. The Romance languages are a good example of fusional languages: the suffix on a verb expresses tense, aspect, and subject agreement, and is difficult to break down into smaller affixes.

The most synthetic languages are often called *polysynthetic*. This name is sometimes reserved for languages where verbs appear to combine morphologically (rather than syntactically) with their objects. For the purposes

of this class, it's not necessary to worry about distinguishing polysynthetic languages from other synthetic languages.

2.2 Parts of Speech I

Determining the **category** of a word (its "part of speech") an important part of morphological and syntactic analysis.

Traditional definitions for parts of speech are often **semantic** (based on *meaning*), but such tests are not reliable—for example, they fail for nouns that seem to describe actions or events (like *action* or *event*!), and for verbs that seem to describe states (like *resemble* or *require*).

In linguistics we use **distributional** tests instead—tests based on the syntactic and morphological contexts in which a word can appear. Here are some distributional tests for the content categories of Nouns, Verbs, Adjectives, and Adverbs. These are the categories we'll focus on in morphology; we'll see examples of function categories when we get to *Parts of Speech II* in a few weeks.

2.2.1 Nouns (N)

- **Syntactic tests:**
  - Can follow a **determiner** (often *a* or *the*).
  - Can be modified by **adjectives**.
  - Can be the **subject** or **object** of a verb.
  - Can be replaced by a **pronoun**.
  - Do not allow objects (without a preposition).
- **Morphological tests:**
  - Have **singular** and **plural** forms: e.g. *books*, *governments*, *happinesses*
    - **Note:** The plurals of some abstract nouns can seem odd! Think outside the box to find contexts where they might naturally occur.

2.2.2 Verbs (V)

- **Syntactic tests:**
  - Can combine with auxiliary verbs (e.g. *can*, *will*, *have*, *be*)
  - Can follow the infinitive marker *to*.
  - Can take an object (without a preposition): *kick the ball**.
- **Morphological tests**
  - Have a third person singular **present tense** form with *-s*
  - Have a **past tense** form, usually with *-ed*
  - Have a **perfect /passive** form, usually with *-ed* or*-en*
  - Have a **progressive** form with *-ing*.

2.2.3 Adjectives (Adj)

- **Syntactic tests:**
  - Modify **nouns** (occur between a determiner and a noun)
  - Can be modified by *very* (but so can many adverbs!)
  - Do not allow objects (without a preposition)
    - There are one or two exceptions to this, but no more than that! Feel free to ask about this in class when we start talking about objects in syntax.
- **Morphological tests:**
  - Can often be suffixed by *-ish*.
  - Have **comparative** and **superlative** forms (e.g. *taller*, *tallest*)

2.2.4 Adverbs (Adv)

- **Syntactic tests:**
  - Modify verbs, adjectives, and other adverbs (anything but nouns!)
  - Cannot appear between a determiner and a noun.
  - Can modify verbs, adjectives, and other adverbs.

- Can be modified by **very** (but so can adjectives!)

- **Morphological tests:**
  - Many (not all) adverbs end in *-ly*

2.2.5 Using morphology to identify parts of speech

In addition to the morphological tests above, you can also use **derivational affixes** to help determine the category of a word. For example:

- Suffixes like *-ment** and *-ness* always **create** nouns; the **base** of *-ment* is always a verb (if it's a free form), and the **base** of *-ness* is usually an adjective.
- Suffixes like *-ify* and *-ize* always **create** verbs; their **bases** are nouns (if they're free forms).

2.3 Derivational Morphology

In this class we'll talk about three main types of morphology:

Derivational morphology: Affixation that changes the meaning or category of its base.

Inflectional morphology: Affixation that expresses grammatical information appropriate to a word's category

Compounding: Combining two roots into a larger word.

The first of these that we'll discuss is derivational morphology; we'll turn to inflection and compounding next week.

Derivational morphology is characterized by **selection**. Derivational morphemes are typically **choosy** about the types of bases they combine with—another word for **choosy** is **selective**.

For example, the suffix *-able* combines only with verbs, and always creates adjectives meaning "able to be *verb*ed": *readable*, *writeable*, *playable*, *employable*, and *googleable* are all possible adjectives of English, even if they don't appear in a dictionary—the other examples probably do show up in most dictionaries, but *googleable* might not, because *google* a relatively recent verb (adapted from the name of the company). But as a native English

speaker I don't need to check the dictionary to find out if something is a possible English word, I can just use any word generated by my mental grammar, and trust that I'll be understood!

A very incomplete sample of derivational affixes in English:

- -able : V→Adj
- -tion : V→Adj
- -en : V→Adj
- -ed : V→Adj
- -ing : V→Adj *or* V→N
- -ment : V→N
- -ness : Adj→N
- -ity : Adj→N
- -ous : N→Adj
- -hood : N→N
- -ize : N→V
- -ly : Adj→Adv
- -ish : Adj→Adj ("somewhat *adjective*", e.g. *tallish*)

There are many more than this! You'll see them inside many words if you start paying attention.

Prefixes in English never change the *category* of the base they attach to, but in English they express clear *meanings*, like negation, repetition, order (e.g. *pre-* and *post-*), etc.

- non- : negative, N→N , Adj→Adj
- un- : negative, V→V, Adj→Adj
- re- : repetitive, V→V

Derivational morphology can also be more selective, attaching only to *some* bases of a particular category. A lot of derivational morphology in English was acquired from borrowing words from French and Latin; these *latinate* affixes often prefer to combine with each other, and sometimes only with roots that are also latinate. Such affixes are less *productive* than other affixes, which combine freely with most bases.

Some of the most productive derivational suffixes in English are *-ish*, which can attach to most adjectives, *-ness*, *-able*, and *-ing*.

-ing is particularly productive: it can attach to all verbs in English to form adjectives (traditionally called "participles") or nouns (traditionally called "gerunds"). It is very unusual for a derivational affix to be *that* productive.

Chapter 3

Fall Week 3: More on Morphology

Contents

3.1 How to draw morphological trees

We've been assuming—though mostly implicitly—that affixes attach in an **order**, or **sequence**. So a word like "governmental", isn't just a string of the root *govern* + the suffix *-ment* + the suffix *-al*. Instead, it's the result of **first** combining *govern* and *-ment*, and then combining the result of that with a further suffix *-al*.

We can represent this ordering with a **tree** structure. Trees are used to represent the **hierarchy**, or **constituency** of language—these are terms that mean, at their core, that in any expression of natural language, some things are more closely related to each other than to anything else. One of the big insights of linguistics is that the organization of language is always hierarchical in this sense (though different theories in linguistics often take different views of what *range* of hierarchical structures are possible in natural languages.)

Here is a tree for *governmental*:

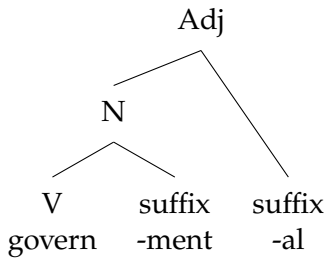


Figure 3.1: Tree for *governmental*

When drawing a morphological tree, we can follow these steps:

1. Identify the root and any affixes
    - 1 root: non-compound word
    - 2 roots: compound word (see below!)
2. Determine the category of the root
3. Determine the order in which affixes attach
4. Determine the category of any intervening bases, and of the whole word.

You might find that it makes sense to do these in different orders, or in different orders in different words. The best way to find out what works for you is to practice!

3.1.1 Order of Affixes

Except in the case of **infixes**—morphemes that attach inside other morphemes (not between other morphemes, actually in the middle of another morpheme!)—each affix you attach must always be at the outer edge of the base it attaches to. This means that when you draw trees they should never have lines in them that cross!

If a word with one root has only suffixes, or only prefixes, there is therefore only one order in which they can attach; it will never be the case that a suffix is added last but appears closer to the root than any other suffix.

But if a word has both prefixes **and** suffixes, then we have to figure out what order they would have attached in. Sometimes this is straightforward, because there is only one order the affixes *could* attach in.

Consider the word *unkindness*. Here we have one prefix and one suffix. So in principle there are two orders in which we could build the word:

1. First attach *un-* to the Adjective root *kind*, building the Adjective *unkind*, then attach *-ness* to *unkind* to get the Noun *unkindness*

2. First attach *-ness* to the Adjective root *kind*, building the Noun *kindness*, then attach *un-* to *kindness* to get the Noun *unkindness*

In both these hypothetical derivations the intermediate base—*unkind* in 1 and *kindness* in 2—is a possible word of English, so from that perspective both derivations seem equally good.

To decide between them, though, we need to look at the **selectional properties** of the affixes involved. Remember, derivational affixes are choosy about the bases they attach to. Most derivational affixes only attach to bases of certain categories.

If we look at *un-*, we find that it only attaches to **verbs** (with a reversal reading, like *undo*) and **adjectives** (with a negative meaning, like *unkind*). It cannot attach to nouns.[1]

If we look at *-ness*, by contrast, it attaches to adjectives to *create* nouns.

[1]The exception is that *un–* does attach to nouns in the artificial version of English, Newspeak, in George Orwell's novel *1984*, and some words like *un–person* have filtered their way into English more generally.

So if *-ness* attached first in this word, it would turn the adjective *kind* into a noun, and *un-* would no longer have the right kind of base to attach to.

This means that it can only be the *first* derivation, where *un-* attaches before *-ness*, while its potential base is still an adjective, that is the correct one.

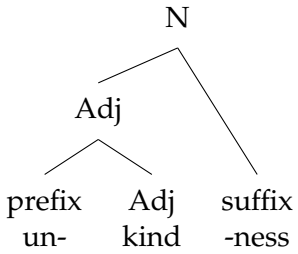


Figure 3.2: Tree for *unkindness*

3.1.2 Structural Ambiguity

It isn't always the case that affixes can only attach in one order, though. Sometimes both orders (or all orders, if there are more than two) meet the selectional requirements of all affixes involved.

When a string is compatible with more than one structural representation, it is **structurally ambiguous**—but not only are both trees potentially correct, they're often associated with different **meanings**.

Consider again the prefix *un-* but now in a word like *untieable*.

The word *untieable* is ambiguous. Pause for a moment and try to come up with its two interpretations.

The two interpretations of *untieable* are:

1. Able to be untied. *For example:** the knot most people use for their shoelaces is chosen because it's easily untieable in this sense.

2. Not able to be tied. *For example:* if you haven't learned to tie knots, a celtic knot[2] might seem untieable in this sense.

As you might be able to see from the **paraphrases** I've given here—a paraphrase is a different way of saying the same thing—we can account for the ambiguity of *untieable* by attaching the two affixes in different orders.

[2] https://www.animatedknots.com/decorative-knots

For meaning 1 "able to be untied", we first attach the prefix *un-* to the verb *tie*, producing the verb *untie* (to undo a knot). Then we attach the suffix *-able* to *untie* to turn it into the adjective *untieable*.

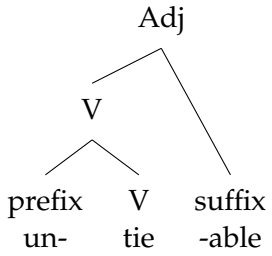


Figure 3.3: Tree for *untieable* ("can be untied")

For meaning 2 "not able to be tied", by contrast, first we attach the suffix *-able* to the verb *tie*, producing the adjective *tieable* (capable of being tied). Then we attach the prefix *un-* to this adjective. Now *un-* has its adjectival meaning, so we end up with an adjective meaning "not capable of being tied".

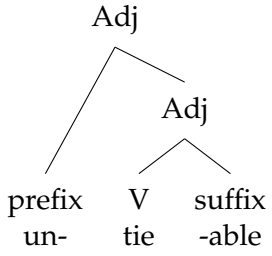


Figure 3.4: Tree for *untieable* ("not possible to tie")

This type of ambiguity in derivational morphology requires that at least one affix be able to attach to bases of more than one category! We'll see that structural ambiguity is even more common in the case of compounds.

Structural ambiguity is different from the type of ambiguity we find with **homophones**—words that sound the same but have different meanings. If I say that I went to the *bank*, without more context you don't know if I went to the kind of bank that's a financial institution or the kind of bank that's the edge of a river. There's nothing *structural* in this ambiguity, but we still have two possible meanings.

3.2 Inflectional Morphology

So far we've focused on derivational morphology. The next kind of morphology we'll discuss is **inflectional morphology**.

Unlike derivational morphology, inflectional morphology never **changes** the category of its base. Instead it simply *suits* the category of its base, expressing grammatical information that's required in a particular language.

In English we have a very limited system of inflectional morphology.

Nouns

- Number: singular vs. plural

Verbs

- Agreement: most verbs agree with third person singular subjects only in the present tense (-s), the verb *to be* has more forms.
- Tense: Past vs. Present
- Perfect/Passive Participle: *-ed* or *-en* (Perfect after auxiliary *have*, Passive after auxiliary *be*)
- Progressive *-ing* (after auxiliary *be*)

Pronouns

- Case:

- Nominative: I, we, you, he, she, it, they
- Accusative: me, us, you, him, her, it, them
- Possessive: my, our, your, his, her, its, their

Adjectives

- Comparative *-er*, Superlative *-est*
  - Arguable! Some people might treat this as derivational

That's all of it! But if we look at languages other than English, we find more types of inflectional morphology.

One thing about inflectional morphology is that lots of it can be expressed **syntactically** instead of morphologically. So some languages have tense, but express it with a particle (a separate word) rather than with an affix on the verb. This is still tense, but it's not part of inflectional morphology!

The textbook discusses some less common types of inflectional morphology found in Indigenous languages in North America; in the rest of this section I give a bit more information about some of the main categories of inflection you might find in languages, whether in linguistics classes or in other languages you study!

3.2.1 Number

Most languages, if they have grammatical number, just distinguish singular and plural, but number systems can be more complex as well.

For example, many languages have **dual** in addition to singular and plural. Dual number is used for groups of exactly two things; we have a tiny bit of dual in English with determiners like *both*, which means strictly two. You have to replace *both* with *all* if the group has three or more things in it.

You'll see an example of dual number in one of this week's practice problems!

A small number of languages go further and also have a **trial** (pronounced "try-ull"), usually only on pronouns. This is used for groups of exactly three.

A language can also have *paucal* number, used for small groups.

3.2.2 Case

Case refers to marking on nouns that reflects their grammatical role in the sentence. Most case systems have ways to distinguish the **subject** from the **object** of a sentence, as well as special marking for **possessors** and **indirect objects**.

Some languages have many more case distinctions than this; usually many of the case forms express meanings that in languages like English we express using prepositions. Estonian and Finnish are known for having especially many cases (14 in Estonian and 15 in Finnish): the Wikipedia article on Finnish cases[3] is a good source if you'd like to learn more.

3.2.3 Agreement

Agreement refers to any inflectional morphology that reflects the properties of a different word in a sentence, usually a noun.

The most common type of agreement is **verbs** agreeing with their subject, though verbs in some languages might also agree with their object (or might sometimes agree with their object instead of their subject). Verbs usually agree with nouns for their **number** and **person**.

Determiners, numerals, and adjectives often agree with the noun they modify, usually for **number**, **case**, and **gender** (assuming a language has some or all of these types of inflection in the first place!).

Nouns can agree with their **possessors** for number and gender as well! You saw examples of this in the Week 2 practice problem from Nahuatl, where nouns had marking indicating whether they were "my", "your.SG", or "their.SG".

3.2.4 Tense and Aspect

Tense refers to the contrast between **present** and **past**, and is typically marked on verbs.

Aspect is a bit harder to define, but is usually characterized as the *perspective* we take on an event: do we describe it as complete or as ongoing? In English we have progressive (marked with *be* + *-ing*) and perfect aspect (*have* + *-ed*/*-en*).

French has a slightly different contrast in the past tense between the *imparfait* and the *passé composé*—these both locate things in the past, but the

[3] https://en.wikipedia.org/wiki/Finnish_noun_cases

imparfait describes them as habitual or ongoing (imperfective aspect), while the other describes them as complete (perfective aspect).

The Mandarin particle *le* (了) also expresses perfective aspect, describing an event as complete, and *zài* (在) expresses progressive aspect, describing an event as in progress. But these are not examples of inflectional *morphology*, because these particles (=small words) are separate from the verb and do not act as affixes.

Terminology for aspectual distinctions can be confusing! In particular, the English **perfect** is not quite the same as the French or Mandarin **perfective**—though just as their names overlap, some of their uses are also similar.

3.2.5 Negation

In English we have derivational negative morphology, which negates the meaning of a base or root.

Inflectional negation, by contrast, makes a whole **sentence** negative. In English we express inflectional negation **syntactically**, with either the word **not** (or its contracted **clitic**[4] form *n't*)

In other languages, however, negation can be expressed by inflectional morphology. We saw this in the practice exercise in Week 2 with an example from Persian.

3.2.6 Other types of inflection

What are some other inflectional distinctions made in the languages of the world? The textbook discusses **clusivity**, distinguishing a first person plural (we) that *includes* the hearer, you, from the first person plural (we)

[4] A clitic is a small word, usually one that passes tests for *separability*, but that is reduced in its form and so "leans" on words next to it. One way of thinking about clitics is that they're pieces that sound like affixes, but whose position is easier to describe with syntax than with morphology. Examples in English include the possessive marked *'s*, and the "contracted" forms of negation *n't* and of auxiliary verbs *'s*, *'m*, *'d*, *'ve*, etc.

that *excludes* the hearer. It also discusses obviation, a distinction between a "proximate" third person and an "obviative" third person (sometimes called "fourth person").

What other types of distinctions can be marked in the verbal inflection of a language? There are a number of distinctions that in English are marked **syntactically**, but in other languages are marked **morphologically**.

3.3 Causatives

A **causative** is a construction that expresses that an event was *caused* by an outside actor. In English we have a few constructions that express causativity, using verbs like *make*, *have*, and *get*:

- English causative with *make*:
  - The tree fell.
  - I made the tree fall.
- English causative with *have*:
  - The actors exited stage right.
  - The director had the actors exit stage right.
- English causative with *get*:
  - The teacher cancelled the exam.
  - The students got the teacher to cancel the exam.

When a language has a **morphological** causative, it expresses these types of meanings by adding a morpheme onto the main verb. For example, in Kinande, a Bantu language spoken in the Democratic Republic of the Congo, the verb *erisóma* means "to read", but *erisóme**sy**a* means "to make (someone) read".

This is a type of morphology that changes the **argument structure** of a verb—the pattern of arguments (subjects, objects, indirect objects) that it combines with. Other types of argument changing morphology are **applicative** or **benefactive** (to do something *to* or *for* someone) and **passive**.

3.4 Evidentials

Many languages use morphology to indicate a speaker's certainty about what they're saying, or the source of their evidence for what they say. This is called **evidential** marking.

For example, in Turkish there is a distinction between the "direct past" *-di*, used to mark things you are certain of or that you directly witnessed, and the "indirect past" *-miš*, used to mark things you have only indirect evidence for.

(1) gel-di
come-PAST
"came"

(2) gel-miš
come-INDIRECT.PAST
"came, evidently"

In English we don't have any grammatical marking of evidentiality! We can still express our evidence or certainty, but we do this with the lexical meanings of nouns, verbs, adjectives, and adverbs. For example, "I saw that..." would express that the source of your evidence is something you saw; "Apparently" would express that you aren't 100% certain, etc.

3.5 Modality

Many languages express the *possibility* or *necessity* of something happening via morphology on the main verb. This is called **modality**. Examples of this include categories like the *conditional* or the *future* in French.

3.5.1 ⭐Departure from the textbook

The textbook treats gender in English (like the difference between *she* and *he*, or between *actor* and *actress*) as a kind of inflectional morphology. However, there's very little evidence that gender is inflectional in English—we would treat this as **derivational** morphology that changes the *meaning* of a word, but is irrelevant for syntax.

By contrast, gender in a language like French can be treated as inflectional: not only do all nouns have a semantically arbitrary gender, determiners and adjectives (and sometimes verbs) show **agreement** with the grammatical gender of the noun they're attached to. For example, the noun *chat*

"cat" in French is masculine (abbreviated M), and so it appears with a masculine determiner and adjective; the noun *abeille* "bee" is feminine (abbreviated F), so it appears with a feminine determiner and adjective. This is independent of the actual sex of a cat or bee!

(3) le petit chat
the.M small.M cat(M)
"the small cat"

(4) la petite abeille
the.F small.F bee(F)
"the small bee"

Many European languages have this type of gender system, which divides nouns into masculine, feminine, and sometimes neuter. It's also found elsewhere in the world: for example, Kanien'kéha has a gender system that includes masculine, feminine/indefinite, and feminine/neuter.

Other languages of the world have different **noun class** or **noun classification** systems, which also divide nouns into somewhat arbitrary classes, but categories that don't match the gender categories used for humans.

For example, the languages in the Bantu family (which includes Zulu and Swahili, among many others) put all humans into one class, but sort all other nouns into somewhere between 4 and 10 classes, which (just like gender in French) can be reflected by agreement on other words in a sentence.

Algonquian languages, including Anishinaabemowin, divide nouns into **animate** and **inanimate**. Animate nouns are usually those that are alive, whether animals or plants, or spiritually important things like *asemaa* (tobacco). Inanimate nouns usually refer to physical objects that aren't alive. Sometimes the same noun can be animate or inanimate with slightly different meanings: for example *mitig* means "tree" when it's animate but "stick" when it's inanimate. There are other nouns that are less predictable: for example, *miskomin* "raspberry" is animate, but *ode'imin* "strawberry" is inanimate.

3.6 Compounding

The last main "type" of morphology we'll discuss is **compounding**. Compounds are words built from more than one root (though they can also be built from derived words): if you find a word that contains more than one root in it, you are definitely dealing with a compound.

English is a language that builds compounds very freely—this is like other languages in the Germanic language family, like German and Dutch. For almost any two categories, you can find examples of compounds in English.

Compounds in English:

Noun-Noun

- doghouse
- website
- basketball
- sunflower
- moonlight
- beekeeper[5]
- spaceship

Adjective-Noun

- greenhouse
- bluebird

Verb-Noun

- breakwater
- baby-sit[6]

Noun-Adjective

- trustworthy
- watertight

Adjective-Adjective

- purebred
- kind-hearted
- blue-green

Noun-Verb

- browbeat
- manhandle
- sidestep

Adjective-Verb

- blacklist

[5]Notice that "keeper" has the suffix *-er*!

[6]Historically *baby-sit* was backfired from the noun-noun compound *baby-sitter*!

In Week 2 some people pointed out that "understand" might be better understood as a compound, with a preposition and a verb root combined. We won't decide on a "correct" answer in this class, but this is definitely something you could argue for!

3.6.1 Compounds and spelling

In English we don't write compounds in a consistent way. Some compounds—typically older ones—are spelled without a space, while others are spelled with a hyphen, and many new compounds are spelled with spaces, as though they are separate words.

We can tell that some sequences of "words" are compounds, though, in a few different ways.

First of all, there is a difference in pronunciation. Compounds are always *stressed* (given emphasis) on their first member; by contrast, phrases (sequence of words) get stress on their last member.

So the compounds:

- ***black****board*
- ***green****house*
- ***blue****bird*

Are pronounced differently than the ordinary sequences of adjectives followed by nouns:

- *black* ***board***
- *green* ***house***
- *blue* ***bird***

Another difference is in the interpretation: a blackboard need not be black, a greenhouse usually isn't green (though you grow green things in it!).

Finally, there's a syntactic difference. Something we'll see when we get to **syntax** is that there's no way to string nouns together in English syntax, without connecting them with prepositions or verbs. So any time you see a string of "words" in English that all look like **nouns**, you have to be dealing with a **compound**.

English really likes building very long compounds out of nouns!

This is something people usually associate with **German**, but not with English. In German, unlike in English, compounds are usually spelled without spaces. So you get words like:

(5) Donau-dampf-schiffahrts-gesellschafts-kapitän
"Danube steam shipping company captain "

I inserted the hyphens in the German example here—but if you look at the English, it actually tracks all the same nouns in the German example! We just have the habit of writing our very long compounds with spaces.

3.6.2 Compounds and headedness

If compounds have more than one root in them, which of them determines the category of the word?

Most compounds—the ones that you might make up on the spot in particular—have a **head**. The head of a compound determines its interpretation (a *sunflower* is a type of flower, a *bluebird* is a type of bird, etc.) as well as its category.

In English, the head of a compound is always on its **right**: English is a right-headed compound language.

Compounds that have a head are called **endocentric**. This is the same *endo-* morpheme you find in *endo-skeleton*. An animal (like a human) with a skeleton inside of it is *endoskeletal*, and a compound with a head inside of it is *endocentric*.

What about the compound equivalent of *exo-skeletal*, animals that have a carapace instead of a skeleton (like insects or crabs)? Compounds that are **exocentric** don't have a head inside of them—they don't describe either of their members.

Some exocentric compounds don't have an *interpretive* head, but still have what we might call a *category* head, in that the root on the right matches the category of the whole compound.

For example, *redhead* ("person with red hair") is often listed as an exocentric compound, because it does not describe a type of head. Similarly *sabretooth* is exocentric because it doesn't describe a type of tooth. But both of

these are noun-noun compounds that are themselves nouns, so their right-hand member is almost a head. A *spoilsport* ("person who spoils other people's fun") is not a type of sport.

But other exocentric compounds don't even have a head in this sense. For example, *outcome* looks like a compound of a preposition and a verb, but is a noun. *Dustup* is a compound of a noun and a preposition, but is a noun. *Tell-all* is a compound of a verb and a determiner (*all*), but is an adjective.

Finally, a special kind of compound is usually called a **dvandva** compound (terminology from Sanskrit grammar, *dvandva* means "pair"). Dvandva compounds can be thought of as "co-headed"—they can be paraphrased with an "and" between the two members.

In English a lot of our dvandva compounds involve roots that only occur in that compound, and that mirror each other's sounds. These are sometimes called **reduplicatives**

- zigzag
- helter skelter
- flip flop
- riff raff
- hocus pocus

But we also have some other dvandva compounds:

- bittersweet
- secretary-treasurer
- parent-child (as in "a parent-child bond")

These are less common than other types of compounds in English.

3.6.3 Ambiguity in Compounding

Just like with derivational morphology, you can have **structural ambiguity** in compounds! In fact, it's even easier to create structurally ambiguous examples, at least in languages that easily build compounds, because any string of noun roots (for example) could hypothetically combine in many different ways!

See the final video from this week for a discussion of one example of structural ambiguity in compounding.

Part III

Syntax

Chapter 4

Fall Week 4: From Morphology to Syntax

Contents

4.1 Syntax: From Words to Phrases

Until now we've been focusing on the structure of **words**. Now we're looking at how words can be organized into **phrases**, which is the domain of **syntax**.

Many of the same concepts arise in syntax as in morphology. For example, we'll use tree diagrams to represent **hierarchical** structure in grammar,

and we'll encounter the idea that syntactic phrases have **heads** in much the same way that compounds do.

To begin, consider a sentence like:

(1) All grypnos are tichek.

While you might not know what a *grypno* is, or what it means to be *tichek* (because these aren't existing words of English), if you know English then you know that this is a grammatical sentence—it's consistent with the way English requires words to be put together into sentences.

Compare this with:

(2) *Grypnos tichek all are.

In comparison, this sentences is **ungrammatical**—even if you did know what a *grypno* was, or what it meant to be *tichek*, this still wouldn't be a possible sentence of English.

Now, something we can be pretty confident about is that you've never heard either of the sentences above before—we can be confident about that precisely because they contained made up words! So that means that your internal grammar of English must be able to generalize to new cases—this, again, is the **infinite generative capacity of language**.

Key point: "Grammaticality" in Linguistics

In linguistics when we say something is "ungrammatical" we don't mean that it's "bad grammar" because that it doesn't follow the type of grammatical rules you might have learned in an English class. Instead, we call things ungrammatical when they are inconsistent with the grammatical system of native speakers.

The evaluation of a sentence by native speakers is called a **grammaticality judgement**. In many cases, different speakers of a language will agree about the status of a particular example, but in more subtle cases they might disagree. Sometimes we are interested in *comparing* sentences, like we did above.

We indicate ungrammatical sentences with an **asterisk** (*) at the beginning of the sentence, sometimes called a **star** (slightly easier to say!).

Sometimes we want to indicate that a sentences is weird because of its meaning, even though it's grammatically fine. In these cases we use a hashmark (#) instead of a star.

4.1.1 Phrases and headedness

One of the really interesting findings of linguistics is that the principles of syntax in **all** human languages make reference to hierarchical structure, not to strings of words. What this means is that the considerations that make some sentences grammatical and others ungrammatical never refer to the "first word in a sentence" or the "third word in a sentence", etc. Instead they refer to **phrases** in particular **structural positions**.

Next week we'll start talking about what it means for something to be in a "structural position". For now let's talk about what it means to be a phrase

A **phrase** is a set of words that act together as a unit. Let's update our previous example sentence with some actual words of English to see what this means:

(3) **All kittens** are cute.

Let's see what other groups of words can appear in the same position as the bolded **all kittens**:

(4) a. **Kittens** are cute.
b. **The kittens that I saw earlier** are cute.
c. **These videos of a baby panda sneezing** are cute.

...and so on. It turns out that lots of different phrases can go in this position—but not all of them! What all these examples have in common is that they have a **plural noun** in the phrase at the beginning: *kittens* or *videos*. If we swap in a singular noun, the sentences would be ungrammatical:

(5) a. ***The kitten** are cute
b. ***The kitten that I saw earlier** are cute.
c. ***This video of a baby panda sneezing** are cute.

...but if we change the plural form *are* to the singular *is* they become good again (this is **subject agreement** inflection):

(6) a. The kitten **is** cute.
b. The kitten that I saw earlier **is** cute.
c. This video of a baby panda sneezing **is** cute.

Other phrases are **not** good in this position, no matter what form of the verb we use.

(7) a. ***That I saw earlier** {is /are} cute.
b. ***Of a baby panda** {is /are} cute.

It turns out that all the phrases that are good in this position are ones that have a **noun** in them—but it's not enough to just have a noun somewhere, as the examples immediately above illustrate, the noun has to be the *focus* of the phrase, or the most important element. This is the **head** of the phrase—a lot of what we'll be doing this week and next is identifying the heads of phrases, and figuring out the category of the head.

Headedness is important to the grammar of **all** languages, not just English.

A further important point in the structure of natural language phrases is that phrases can contain other phrases of the same type inside of them. So for example, the noun phrase [these videos of a baby panda] contains a second noun phrase inside it, [a baby panda].

The ability of a structure to contain another structure of the same type inside itself is called **recursion**, and is another key property of natural language grammars.

4.1.2 Building trees

Let's think for a moment about how linguistic structures are **built**.

In morphology we talked about trees as representing a derivation or structure in which there are sub-units—some elements are more closely related to each other than other units are.

The same thing is true in syntax—we'll talk about building syntactic structures by taking things and putting them together to build larger and larger structures. Syntactic structures will start with words and will assemble them into larger units, always by taking two things and putting them together.

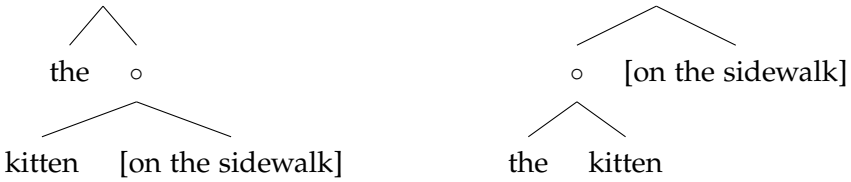
If you have two things **A** and **B** and you put them together you'll have a structure like this:

The operation that puts two things together into a larger structure is called **Merge**—though we won't be concerned with the specific properties of this operation.

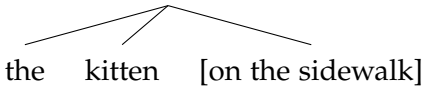
Now, in our A+B structure we now need to ask: is the result of merging A and B an A-type phrase or a B-type phrase? The point of headedness is that it has to be one of those things—the result of combining A and B will never be an "A-B" phrase.

Let's think about the noun phrase *the kitten on the sidewalk*. This has three sub-units in it: a determiner *the*, the noun *kitten*, and a prepositional phrase *on the sidewalk* (for the moment we will ignore the structure inside the prepositional phrase).

How do we put these things together? Well there are two possibilities (the ◦ in these trees is just a placeholder so the diagrams appear properly).



And a third if we can put three things together at once:



These trees make different claims about how the parts of this noun phrase are related to one another—either *kitten* is more closely related to the PP, or it's more closely related to the determiner, or everything is on the same level.

These are differences in **constituency**. As we move through our units on syntax we'll see **tests** for constituency, and it will turn out that the first tree—where *kitten* is more closely related to a prepositional phrase in the noun phrase than it is to a determiner—is always correct, not just for English but for all languages (though sometimes the order of elements will be different than it is in English).

Before we can look at these kinds of tests, though, we'll need more terminology for basic grammatical relations, and tests for syntactic categories, which is the remainder of what we're doing this week.

4.1.3 ★Relationships between phrases

This section reviews some key grammatical terminology that you might be familiar with from elsewhere (often from language classes), but that will be important for describing the basic structure of sentences.

Sentence A string of words that expresses a complete **proposition**. For statements (as opposed to questions or commands), a proposition is something that can be *true* or *false*.

A sentences is a **clause** that stands on its own as an utterance. A clause is a combination of one subject and one predicate—some clauses occur *inside* other clauses (see below on *complex sentences*), though, and so these clauses aren't independent sentences.

Sentences are minimally made up of a **predicate** and its **arguments**.

Predicates the state, event, or activity that the sentence attributes to its **subject**.

The word "predicate" is used in two ways. Sometimes it describes just a single head/word (usually a verb or an adjective), but sometimes its used to describe everything in the sentence other than the subject (e.g. a whole **verb phrase**).

4.2 Classifying arguments

Arguments are the participants or actors we are describing with the predicate. They are typically **noun phrases**, but it's possible to have arguments of other types (usually prepositional phrases or whole clauses).

Examples: In the following sentences the arguments are in **bold** and the predicate is italicized.

(8) **Alice** *loves **chocolate***.

(9) **The children** *gave **[the kitten]** **[a toy]***.

(10) **Everyone** *is excited*.

Transitivity Predicates can be classified by the *number* of arguments they take. This is also called the **valency** of a predicate.

Intransitive One argument (the subject).

Transitive Two arguments (subject and direct object).

Ditransitive Three arguments (subject, direct object, and indirect object.)

Argument types We can classify arguments in two ways: their position in the sentence, and how they're related to the predicate (are they the actor, the thing acted upon, etc).

For now we will focus on the position of arguments in English.

Subject Almost always appears *before* the predicate in English, and controls agreement on the verb.

Direct object Usually appears *after* the verb in English.

Indirect object: Only appears when a verb has three arguments. Generally the recipient of the direct object. Sometimes (not always) marked by "to".

4.3 Classifying whole sentences

We can classify sentences/clauses in a number of ways. Here we focus on key terminology relating to their **function** and their **structure**.

Classifying by **function** refers to how we use the sentence—whether we use it to make a statement, ask a question, or give a command

Declarative: Statements. Things that can be true or false.

Interrogatives: Questions.

- Yes-No Questions: *Did Sarah watch a movie?*
- WH-Questions: *What did Sarah watch?*

Imperatives: Direct commands.

- *Open the door!*

Classifying by **structure** refers to whether a sentence has one clause or more than one clause, and if more than one clause how the multiple clauses are related to each other.

A sentence is **simple** if it contains only one clause. For example:

(11) Asha laughed.

A **compound** sentence has two clauses, linked by a conjunction (*and*, *or*, or *but*):

(12) Asha laughed and Sue cried.

A **complex** sentence is one that contains a subordinate /embedded clause—a clause inside a clause (recursion!).

(13) Jamal knows that Asha laughed.

4.3.1 Determining the category of phrases

1. Identify the major constituents (= the head of the predicate and its arguments)
2. Determine the category of the "main word" in each constituent (its **head**)
    - *Hint* predicates will usually be verb phrases, arguments will usually be noun phrases—but not always!
3. The phrases will be of the same category as their **heads** (= the "main word").

A note about verb phrases:

- The **objects** of a verb are part of the verb phrase. This will be covered in Week 5!

4.4 Parts of Speech II

As we mentioned when we first reviewed parts of speech, in linguistics we rely on **distributional** tests for categories. So when we call something a **noun** we're not basing that on its meaning, we're saying that there's a set of words that can appear in the same kinds of contexts, and our label for that category is "noun".

Every word heads a phrase of the same type. We abbreviate categories with a single letter (or short set of letters) X, and abbreviate phrases with the letter P. So a phrase headed by X would be an XP.

The distributional tests listed here are specific to English—but as with morphology, we generally hypothesize that some of the principles involved extend to other languages, in the absence of evidence to the contrary.

4.4.1 Lexical categories

Review 2.2 for distributional tests for the lexical categories N, V, Adj, and Adv (which head NP, VP, AdjP, and AdvP).

4.4.2 Functional categories

Functional categories can be thought of as the grammatical glue that holds syntax together. While lexical categories mostly describe non-linguistic things, states, or events, functional categories often have purely grammatical meanings.

The main functional categories we'll be dealing with are described in this section.

4.4.2.1 Determiner

You may be familiar with the **definite article** *the* and **indefinite article** *a(n)*.

(14) a. the book
b. a cat

These occur in noun phrases before the head noun, as well as before any numbers or adjectives:

(15) a. the three red books
b. a large angry cat

In fact, they are usually the very **first** thing in a noun phrase, and you can only have one of them (unlike adjectives, which you can pile up). If you try to have more than one, the result is ungrammatical

(16) a. *a the book
b. *the a cat

This distribution doesn't apply only to *the* and *a(n)*, though. There are a bunch of other elements that occur in exactly the same places, with exactly the same restrictions. These other things aren't articles in traditional grammar, so we call this larger functional category **determiners**.

Some other determiners:

- Demonstratives (*this*, *that*, *these*, *those*)
- Some **quantifiers** (*every*, *some*, *each*, *most*, etc.)

Test for yourself that these occur in the same places in noun phrases as *the* and *a(n)* do—and that some other words expressing quantities (like *all* and *many*) and numbers do not.

4.4.2.2 Pronouns

Pronouns are a special functional category that can *replace* a whole noun phrase. The set of pronouns in my variety of English is limited to the following (each row lists the nominative, accusative, and genitive forms of the pronoun):

- First person singular: I /me /my
- First person plural: we /us /our
- Second person: you /you /your
- Third person singular inanimate: it /it /its
- Third person singular feminine: she /her /her
- Third person singular masculine: he /him /his
- Third person animate singular /general plural: they /them /their

Many people have a dedicated second person plural like *y'all* or *yous*; some people have different case forms for some of the pronouns.

4.4.2.3 Auxiliaries

Auxiliaries are like verbs in that they can be present or past tense, and can show agreement, but they always occur alongside a lexical main verb. For this reason they're sometimes called "helping verbs".

For example, in the **progressive** in English we see the auxiliary *be*, alongside a main verb that ends in the inflectional suffix *-ing*:

(17) The bears are dancing.

The auxiliary occurs after the subject and before the main verb.

If a sentence is negative, at least one auxiliary will occur to the left of negative *not* /*n't*:

(18) The bears aren't dancing.

In a Yes-No question, at least one auxiliary appears at the front of the sentence, before the subject:

(19) Are the bears dancing?

The auxiliaries in English are:

- *have* (followed by a past participle)
- *be* (followed by a past participle in the passive, and a present participle in the progressive)
- *do* (used in questions and negation when there's no other auxiliary)

Importantly, these can all also be used as lexical verbs! They're auxiliaries only when there's also another verb in the clause that's acting as the lexical verb.

We also have a class of **modal** auxiliaries. These only occur as auxiliaries in modern English, and are different from the other auxiliaries in that they don't agree with the subject. The modal auxiliaries are:

- will
- would
- can
- could
- may
- might
- shall (archaic for many people)
- should
- must

This list sometimes includes *ought* (as in *You ought not do that.*)*need* (as in *You need not go*) and *dare* (as in *I dare not try*), but these probably aren't used as modals anymore by most people in this class.

Test for yourself that these have the same distribution illustrated above for the progressive auxiliary *are*!

4.4.2.4 Prepositions

Prepositions express locations or grammatical relations. They are almost always followed by noun phrases (though a few prepositions can occur by themselves), and can sometimes be modified by words like *very* or *way*.

Some prepositions:

- on
- up
- beside
- through
- outside
- in
- above
- to
- of
- with
- for
- without

4.4.2.5 Other functional categories

A few other functional categories are described in the relevant content lecture video: **Degree** words like *very* and *way*, **Numbers** (which we'll distinguish from adjectives in general, and includes words like *many* and *few*), and Conjunctions (which only include *and* , *or*, and *but*).

Two other important functional categories will come up as we move through syntax: **tense**, which will be the category that heads sentences, and **complementizers**, which will introduce embedded clauses. For now, don't worry about identifying these categories, they're mentioned just for completeness.

4.5 Functional categories as "closed class"

While there are only the four lexical categories listed above (N, V, Adj, Adv), there are many functional categories—and we will occasionally add more as we move through the units in syntax.

Even though there are lots of different functional categories, it's also much harder to add new words to an existing functional category than it is to come up with new lexical items. So I can coin new nouns (like *grypno*) and new adjectives (like *tichek*) very easily, but it's more difficult to add, say, a brand-new determiner or auxiliary to a language.

But it's definitely not impossible! Consider the functional category of pronouns. There are lots of new pronouns that people have proposed as nonbinary pronouns. These **neopronouns** are sometimes harder to get the hang of using than new lexical nouns are, which is one of the signs that pronouns are more of a functional category—but it's very possible to become a fluent user of a new pronoun with a bit of practice.

4.6 ★Language variation: word order

In one of the sections above we reviewed terminology relating to predicates and their arguments (subjects and objects). In some languages, these relationships determine the **word order** of a sentence.

In English, the basic word order is **Subject-Predicate**, also often described as **Subject-Verb-Object** (SVO). This is the most common basic word order in the world's languages—it's found in most of the Romance languages, and in both Mandarin and Cantonese—but all the other logically possible word orders are also attested. The second most common basic word order is Subject-Object-Verb—for example, Japanese and Korean are both SOV languages. Lots of languages have the order Verb-Subject-Object, for example Irish and the other Celtic languages, as well as in Anishinaabemowin. Orders where the object comes before the subject (VOS, OVS, OSV) are less common, but found in a few languages.

But while most languages have a basic word order, found in most neutral sentences, in many languages this order is much more flexible than it is in English.

When word order is flexible, it's usually the case that it's determined at least partly by **topic** and/or **focus**—the topic is the thing you're talking about, and the focus is something you want to emphasize. So while English has a very strict subject-predicate word order, languages with word order

that is flexible with respect to the subject and predicate might be said to have a strict **topic-comment** word order.

Chapter 11.4 in the textbook gives a lot of examples of flexible word order of this type in Mohawk—showing that translating from English isn't always straightforward, with many different translations being possible with shades of meaning that can be a bit hard to distinguish in English (though you can get part of the way by putting stress or emphasis on specific words).

Anishinaabemowin also has this kind of flexibility in its word order, as does ASL.

Chapter 5

Fall Week 5: Building Trees

Contents

5.1 Phrase Structure Rules

This week we're beginning with a slight step back from thinking about drawing *trees* to represent syntactic structure. Instead we're going to start

with **phrase structure rules**, which can help ground the kinds of representations we also represent in our trees.

Before moving on with phrase structure rules, though, note that we'll be revising basically everything in this section! Do **not** draw trees for any assignments using phrase structure rules instead of X-bar Theory, you will lose many points!

5.1.1 What is a Phrase Structure Rule?

Phrase Structure Rules—usually abbreviated **PS Rules**—can be thought of as **rewrite rules**, for either trees or strings.

Let's think of PS Rules for a moment as things that apply to strings of symbols, and that we're trying to characterize what sequences of words in a language are grammatical sentences.

So we start with a single symbol:

- S

That stands for "Sentence". What kinds of things are sentences? Well, we know that a sentence consists of (at least) a subject and a predicate, and that subjects are (usually) NPs, and predicates are often VPs. So we can formulate a rule like:

- S $\rightarrow$ NP VP

This rule says that wherever you have an S, it is possible for that S to be made up of an NP followed by a VP.

This can be represented with a tree diagram:

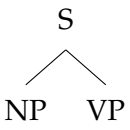


Figure 5.1: Tree for showing basic sentence constituency (to be revised)

In a theory entirely built on PS Rules, you would have PS Rules that rewrite category labels with actual words, like:

- N $\rightarrow$ "dog"
- N $\rightarrow$ "cat"

- N → "mountain"
- N → "happiness"

This is a *top down* view of syntactic structures. We will ultimately be developing a theory of syntax that's framed not in PS Rules but in terms of X-bar Theory, which in some ways is a more *bottom up* view of syntactic structure, where phrases of all kinds are **projected** from individual words or morphemes.

PS Rules were central to the theory of syntax developed in Chomsky (1957), which started the modern field of generative syntax.

5.1.2 Phrase Structure of NPs

PS Rules describe the possible *shapes* of phrases. We've already seen many different shapes of noun phrases (NPs)—in part because it's very easy to identify NPs in sentences, a simple **replacement constituency test**: NPs can be identified because they can be replaced by a pronoun, a proper name, or a noun standing by itself.

Constituency tests are important, and you should practice applying them to figure out syntactic structure! They are covered in the textbook, but **not** further covered in these topic guides or in the content lecture videos.

Here are some NPs—you might think of a sentence in which some or all of them can occur! Remember that an NP will always be able to be **replaced by a pronoun.**

(1) a. robots
b. some robots
c. six robots
d. the six robots
e. the six small robots
f. robots from Boston
g. the robots from Boston
h. the six small robots from Boston

These NPs would be generated by the following PS Rules:

(2)	a.	robots	NP → N
	b.	some robots	NP → Det N
	c.	six robots	NP → Num N
	d.	the six robots	NP → Det Num N
	e.	the six small robots	NP → Det Num Adj N
	f.	robots from Boston	NP → N PP
	g.	the robots from Boston	NP → Det N PP
	h.	the six small robots from Boston	NP → Det Num Adj N PP

We can abstract across all of these, and write a general PS Rule for NPs, by **putting parentheses around all optional elements**:

- NP → (Det) (Num) $(\text{Adj})_n$ N $(\text{PP})_n$

This can be read as:

> An NP can consist of a determiner (optional), followed by a numeral (optional), followed by any number of adjectives (all optional), followed by a noun (required), followed by any number of prepositional phrases (all optional).

For now I've left *Det*, *Num*, and *Adj* as single words (not phrases); note that eventually we'll say that a determiner always occurs as part of a DP, a numeral always as part of a NumP, an adjective always as part of an AdjP, etc.

5.1.3 Phrase Structure of PPs

In defining the shape of NPs, we referred to prepositional phrases (PP). There are fewer possible shapes that PPs take! Here are some examples:

(3) a. from Boston
b. outside
c. way beyond my knowledge

These can be generated by the PS Rules:

- PP → P NP
- PP → P
- PP → Deg P NP

We can abstract this in the single PS Rule:

- PP $\rightarrow$ (Deg) P (NP)

We could then expand the "NP" symbol using our PS Rule for NPs in the previous section! That NP might contain another PP inside it—here we've encountered **recursion** again.

5.1.4 Phrase Structure of VPs

Now let's look at some verb phrases (VPs). In the following examples, the VPs are all in [square brackets].

(4) a. The crew [repaired the ship.]
b. The captain [gave the crew orders.]
c. The spaceship [arrived.]
d. The spaceship [travelled between two planets.]

How do we know these are VPs? Well, they come after the *subject* of the sentence (an NP in all these examples), so that means they are predicates. In one case the predicate is a single word *arrived*—this word is a verb, so the only thing it could be is a verb phrase. All the other sequences in square brackets could be swapped into the same position as *arrived*, so they must be phrases of the same type. For example:

(5) The spaceship [gave the crew orders.]

Another test would be the **replacement test** for VPs, which involves replacement with *do*.

By contrast, you can't swap *arrived* into the position occupied by the other verbs by themselves (with the exception of *travelled*).

(6) a. *The crew [arrived] the ship.
b. *The captain [arrived] the crew orders.
c. *The captain [arrived] orders.
d. The spaceship [arrived] between two planets.

So these are all VPs. We have intransitive VPs with just a verb, transitive VPs with one NP, and ditransitive VPs with two NPs. As it happens, many ditransitive verbs in English can also appear with an NP and a PP (some ditransitive verbs, like *put*, only allow the NP PP version):

(7) The captain [gave orders to the crew]

These VPs can be derived with the following PS Rules:

- VP $\rightarrow$ $V_{intrans}$
- VP $\rightarrow$ V_{trans} NP
- VP $\rightarrow$ $V_{ditrans}$ NP NP
- VP $\rightarrow$ $V_{ditrans}$ NP PP

If we looked at a wider range of VPs we'd also find that adverb phrases can go at the *beginning* or *end* of VPs, though not typically in the middle. So we'd end up with the following general PS rule for VP:

- VP $\rightarrow$ (AdvP) V (NP) (NP/PP) (AdvP)

There are also some cases where a verb can be followed by an adjective phrase:

(8) We are happy.

(9) They seem nice.

There isn't an easy way to collapse this with our previous PS Rule, so for now we'll simply list another PS rule for VP:

- VP $\rightarrow$ V AdjP

5.1.5 Modifier PS Rules

We can also formulate PS rules for various modifier phrases, AdvP, AdjP, and NumP.

Adverb phrases consist of an adverb, preceded by an optional degree phrase:

(10)
a. quickly
b. very quickly
c. quite quickly

This is summarized by the following PS rule:

- AdvP $\rightarrow$ (DegP) Adv

You can also get a PP following an Adverb.

Can you think of examples?

Adjective phrases are similar:

(11) The robot is [very proud of itself]

- AdjP → (DegP) Adj (PP)

Number phrases are also modified by degree phrases!

(12) a. exactly six
b. approximately five

- NumP → (DegP) Num

Variation! NPs after Adjectives

The "objects" of adjectives are almost always expressed by PPs—that is, if there's something in an AdjP that comes after the adjective, it usually can't be an NP (or a VP), but instead has to be a PP.

There are a very tiny number of exceptions to this! In my variety of English there are exactly three—depending on your variety of English you might have only one exception, or might have a few more than I do.

The one exception that all English speakers have (to my knowledge) is the adjective *worth*. So we can say:

(13) This object is [worth a lot of money.]

Here the adjective is followed by the NP [*a lot of money*]. The NP has to be something that expresses a value.

Some English speakers (including me) have another exception with the deverbal adjectives *finished* and *done*:

(14) I am [finished my coffee.]

(15) The children are [done their homework.]

This is typical for Canadian English speakers, and also common in upstate New York and in Pennsylvania. If you aren't from one of those places, you might need to use the verbal perfect (*have finished my coffee*, *have done their homework*), or use the preposition *with*:

(16) I am [finished **with** my coffee.]

(17) The children are [done **with** their homework.]

Some people allow a few more adjectives in this construction, but they're all deverbal (that is: derived from verbs): *started*, *completed*, etc.

No other adjectives allow bare NP objects, as far as I know—but if you accept other adjectives with an NP object, let me know!

5.1.6 PS Rules for Sentences

Let's return to PS rules for whole sentences. We've already seen that sentences can consist of an NP followed by a VP:

(18) [The robot] [repaired the spaceship.]

They can also have an **auxiliary** (modal or non-modal), and can have adverbs at the beginning or end.

(19) a. [The robot] will [repair the spaceship.]
b. Maybe [The robot] will [repair the spaceship] tomorrow.

You can also put **negation** in a sentence—though negation always requires an auxiliary in English (if there isn't already an auxiliary, you insert auxiliary *do*):

(20) a. [The robot] did not [repair the spaceship.]
b. [The robot] has not [repaired the spaceship.]

From these we can get a full PS rule with several optional elements, but an obligatory NP subject and an obligatory VP predicate:

- S → (AdvP) NP (Aux) (Neg) VP (AdvP)

5.2 X-Bar Theory

PS rules provide a useful starting point for thinking about the structure of possible sentences—but they don't really start explaining *why* certain structures are grammatical, or predicting what possible and impossible grammars might look like.

The theory we'll be using in LING 100 goes a step beyond PS rules, trying to constrain our theory of syntax so that it predicts the range of possible natural language grammars. This theory is called **X-Bar Theory**, because it introduces an extra layer of structure inside phrases called the "bar level".

5.2.1 X-Bar Theory Part 1: Headedness

Let's start by thinking about a type of structure that's really easy to describe using a PS rule:

- **Weird PS rule:** NP → V (Adj) PP

As I just said, this is an easy rule to write! But it's weird because it describes a noun phrase that would be made up of a verb, followed by an optional adjective, followed by an obligatory PP.

This is weird because it's a noun phrase that's *missing the noun!* What makes something a noun phrase is precisely that it has a noun inside it. This is the idea that all natural language phrases have **heads**, and it's the first part of X-bar theory:

- Every phrase (XP) has a head of the same category (X)

And this goes the other way as well: all **heads** (words) **project** (or "occur inside") a phrase of their category:

- Every head (X) projects a phrase of the same category (XP)

This is why we've been specifying AdvP /DP /AdjP /DegP and so on, even when phrases consist of a single word!

5.2.2 X-Bar Theory Part 2: Constituents *inside* Phrases

The other part of X-bar theory arises from the observation that phrases aren't just a flat structure.

Our PS rule for NPs, for example, could build NPs that contain a determiner (or DP), a noun, and a PP, but there was no sub-grouping:

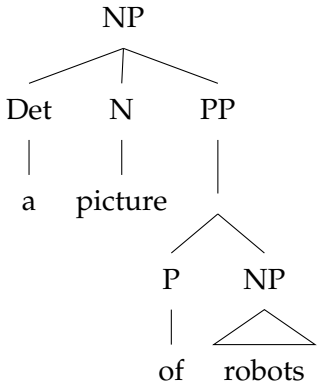


Figure 5.2: Tree for NP *a picture of robots*

In these topic guides I use triangles in trees to abbreviate structure that we're ignoring at the moment. You should never use triangles on assignments unless you are explicitly told it's allowed for that specific question.

What we'll find if we look at phrases of all types, in all languages, is that head is always in a closer relationship with one other element inside the phrase, than with anything else.

In English: heads are in a closer relationship with what **follows** them.

This means that there are units—**constituents**—inside phrases. So not only do all heads have phrases, and all phrases have heads, but there is what

we might call a "mid sized sub-phrase" in every phrase (or an "intermediate phrase"). This mid-sized phrase is called **X-bar** (written **X'**).

So we expand X-bar theory to the following generalization, expressed in PS Rules

- XP $\rightarrow$ (YP) X'
- X' $\rightarrow$ X (ZP)

Or, putting this in a tree:

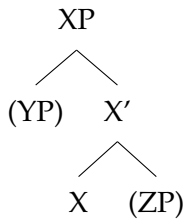


Figure 5.3: Basic X-bar constituency (for English)

The positions occupied by YP and ZP are **argument positions**, and they have special names:[1]

Complement: Sibling of the head X (child of X') is its **complement**

Heads **select** their complement (including *if* they take a complement)

Specifier: The child of XP, sister of X' is the **specifier** of the phrase

The sibling of the head is the copml**e**ment, not the compl**i**ment! This is "complement" as in set theory, not as in saying nice things to someone.

If we put these labels in the tree in place os "YP" and "ZP" above, we get a **general X-bar template for English**:

[1] The traditional names for structural relations involve feminine family terms: *mother*, *daughter*, *sister*. Here I follow *Essensials of Linguistics* in using gender neutral kinship terms.

5.3 Constituency inside NPs

The evidence for N′ ("N-bar") involves showing that a noun is in a closer relationship with a PP that follows it than it is with a previous determiner.

We can show this with **constituency tests** that target this sub-NP unit.

The first tense involves **ellipsis**, which is the name in linguistics for a process where one or more words can be left out if they're clear from context.

In English ellipsis is possible inside an NP when there's a previous NP that's parallel and that contains exactly the same material. So for example, if I say:

(21) I arrived on [today's flight from Mars]

I can follow this up by saying:

(22) . . . and you arrived on [yesterday's ___]

Where that blank is understood as [*flight from Mars*], understood from the previous context.

There I elided the N + PP, leaving the possessor behind. What I **can't** do is elide the possessor + N, leaving the PP behind:

(23) *. . . and you arrived on [___ from Venus]

This is **ungrammatical**.

We get a similar result from another constituency test, this one involving replacement with *one*. Again, I can replace an N and the following PP with *one* (assuming there's an earlier NP that makes it clear what I mean by "one"), but it's not possible to replace a determiner and an N, leaving the PP behind:

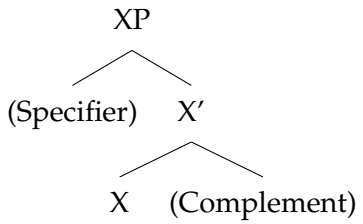


Figure 5.4: Basic X-bar constituency (for English), labelling Specifier and Complement positions

(24) The first *launch of a spaceship* is exciting, but...
   a. [the second **one**] is not. (where "one"="first launch of a spaceship")
   b. *[**one** of a mining vessel] is not. (where "one"="the first launch")

This gives us the following overall structure of an NP, showing a **closer relationship** between the N and a following PP than between either of those and the preceding DP:

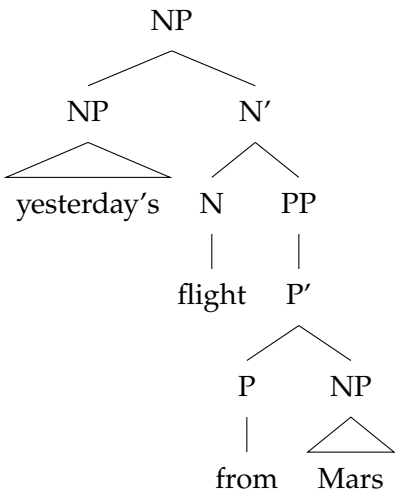


Figure 5.5: Tree for NP *yesterday's flight from Mars*

5.4 Constituency inside VPs

We can do similar tests to find a constituent inside VP, consisting of the verb and its object.

Again, we can **elide** a verb and its object, leaving a previous AdvP behind, but we cannot elide AdvP + V, leaving the NP object behind.

(25) They will [quickly build a spaceship]
   a. ...and we will [slowly ____]
   b. *...and we will [____ an orbital station] (not great if the gap is "quickly build")

Even clearer is replacement with "do so":

(26) They will [quickly build a spaceship]
  a. . . . and we will [slowly **do so**]
  b. *. . . and we will [**do so** an orbital station]

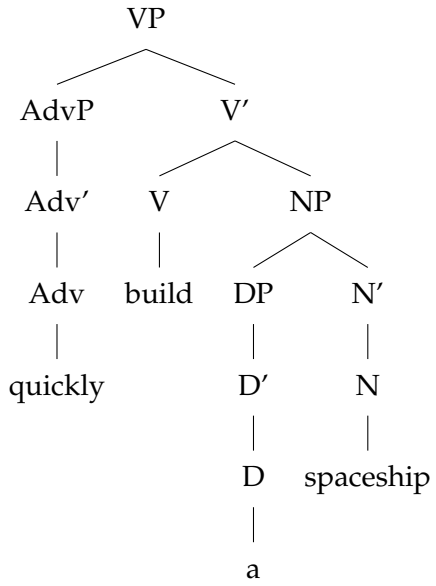


Figure 5.6: Tree for VP *quickly build a spaceship*

5.5 Heads *select* what comes after them

Finally, there are conceptual reasons to think that the head of a phrase is in a closer relationship than one other element, and that has to do with **selection**.

Recall that we classify verbs by their **transitivity** (aka **valency**)—that is, by how many objects they take. Each verb has an opinion about whether and how many objects are allowed with it.

By contrast, there's no verb that cares whether it's modified by an adverb—or, indeed, no verb that cares whether it has a subject or not (all verbs in English require subjects).

So in that sense verbs have a **semantically** closer relationship to their objects than they do to anything else in the sentence. This semantic closeness is reflected by the bar-level in syntax, which contains just the verb and its complement (=object).

5.6 Sentences as TPs

So far we've applied X-bar theory to a range of phrase types—and we'll apply it to **all** phrases.

But what about sentences? Up to this point we've simply been labelling them as "S":

(27) [$_{S}$ [$_{NP}$ The robot] [$_{VP}$ repaired a spaceship]]

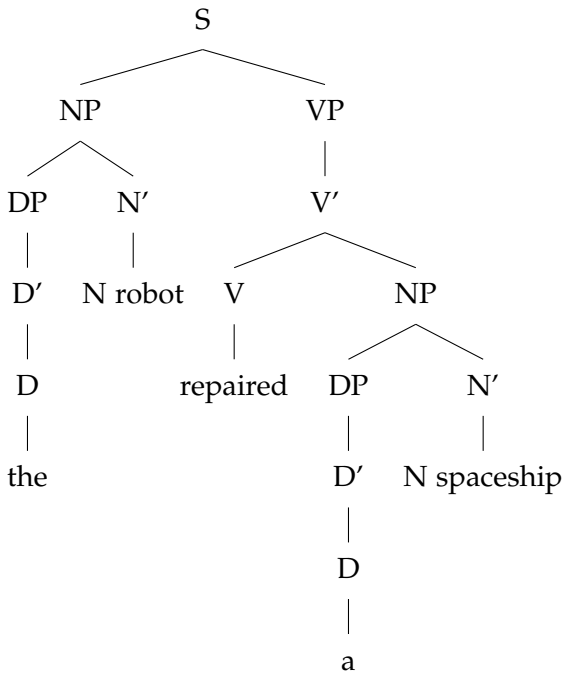


Figure 5.7: Tree for (27) (to be revised)

But if a "phrase" is a string of words that form a constituent, then sentences are also phrases! And X-bar theory tells us that all phrases have heads.

What could the head of the sentence be?

Recall that with PS Rules we had:

- S $\rightarrow$ NP (Aux) VP

This rule allows sentences to include an auxiliary between the subject NP and the predicate VP, as in (28):

(28) The robot **will** repair a spaceship.

If we put the auxiliary into our tree in 5.7, this actually worsens the problem for X-bar theory: as shown in 5.8, now not only does the Sentence not have a head, but the auxiliary is a head without a phrase!

We could simply put the Aux into an AuxP, as we did with determiners, degree adverbs, etc.

Instead, however, we'll solve both the lack of a phrase for Aux and the lack of a head for S in one stroke, by analyzing the auxiliary itself as the head of the phrase, as in 5.9.

What if there weren't an auxiliary, though? Are all sentences AuxPs?

No. In fact, if we think about what auxiliaries in English express, they are always inflected for **tense**—they make a sentence finite. And indeed, in the absence of an auxiliary, we also see tense on the main verb!

So we're going to say that sentences aren't auxiliary phrases, they're **tense phrases**.

Tense represents **finiteness**—we say that sentences when they stand independently are always **finite**, which is a term meaning that they have tense.

So X-bar theory motivates us to look at sentences and ask what their structure might be, and we end up saying that sentences are Tense Phrases (TPs).

TP is a very nice phrase from the

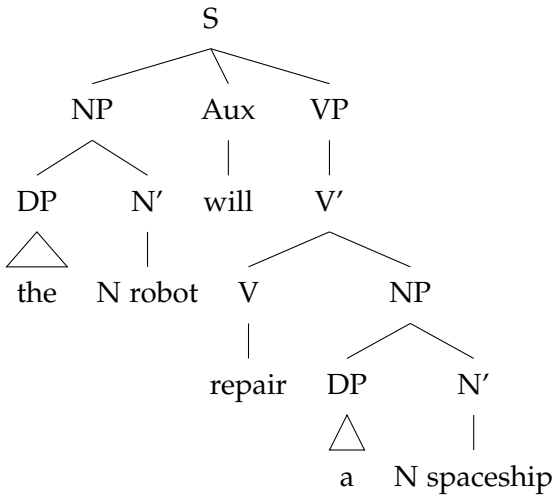


Figure 5.8: Tree for (28) (to be revised)

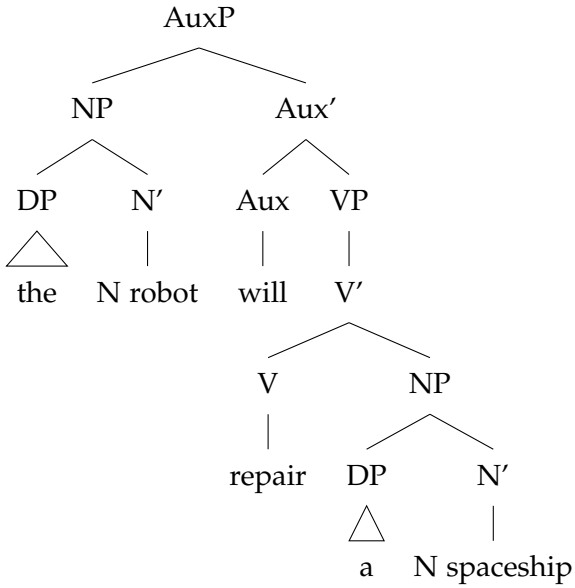


Figure 5.9: Revised tree for (28) with AuxP (to be revised further)

perspective of X-bar theory, in fact, because it always has both a **specifier** (the subject) and a **complement** (the predicate).

What things are of category T?

- The modal auxiliaries
- The non-modal auxiliaries
- Abstract tense features ([PRES] or [PAST])

So the final version of the tree for (28) is as in 5.10 (the final version of the tree!), and if we look back at (27), which didn't have an auxiliary, the final version of the tree for that would be as in 5.11.

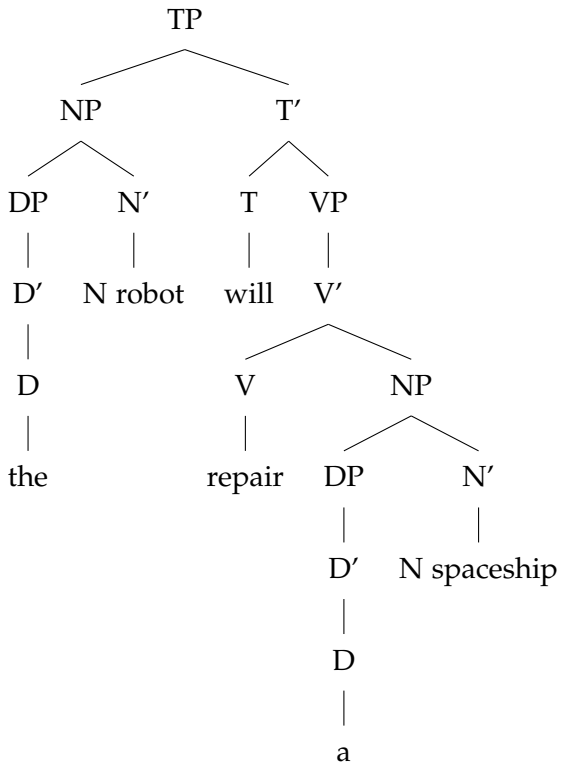


Figure 5.10: Tree for (28) with TP (final!)

What about languages that don't have tense?

There are different options! We could say that languages that don't require tense—like Chinese, for example—don't have sentences that are TPs, but instead have some other category. (You might think about what some plausible options might be!)

The other option is to assume that even though we don't pronounce tense in all languages, it's nonetheless the case that something abstract makes a sentence a sentence—something that corresponds to "finiteness". So even if it doesn't have the same *meaning* as English tense, there's something that

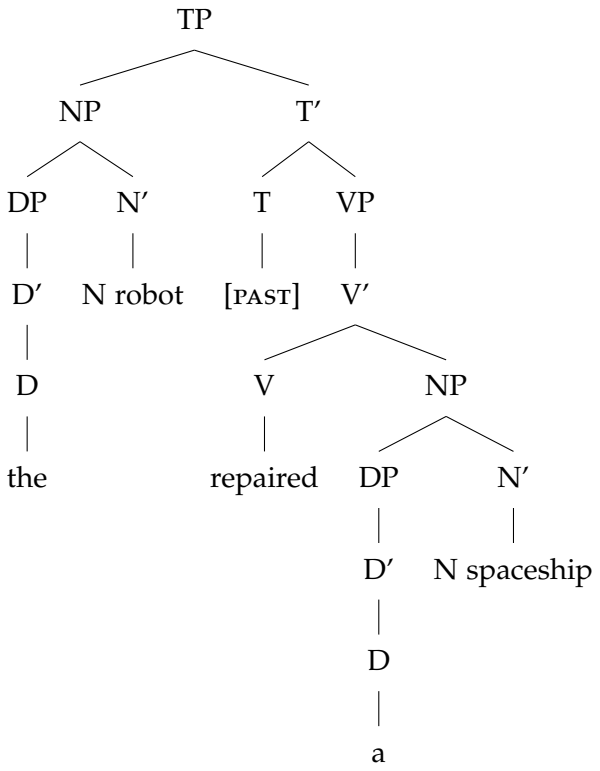


Figure 5.11: Tree for (27) with TP (final!)

does the same grammatical work of anchoring a clause, and gluing the subject and predicate together.

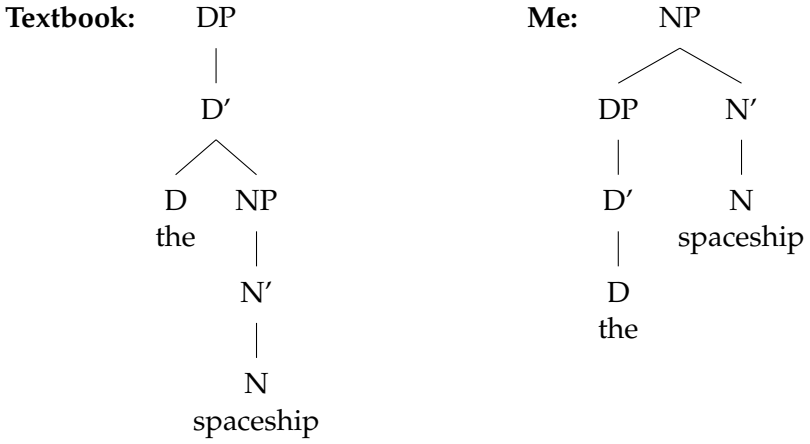
This second option is fairly widely assumed, in the type of syntactic theory that we're learning in this class (descendants of X-bar theory). People sometimes use the label "Inflection Phrase" (InflP or IP), but it's also common to simply use the label "TP" even if you're assuming that the semantic content of this functional phrase might vary.

In LING 100, whenever you're working on the syntax of another language, you should always assume that sentences in that language are TPs, and label them accordingly. Auxiliaries should go in T unless you have evidence to the contrary.

5.7 The relationship between DP and NP

The textbook shows trees where determiner phrases (DPs) are on top of NPs—**NP is the complement of DP**. By contrast, I've been drawing trees where **DPs are in the specifier of NPs.**

(29) The spaceship



These are different hypotheses about the relationship between DP and NP! However, in LING 100 we won't be looking at the type of evidence that decides between them—as a matter of fact, most linguists who use X-bar theory assume that NPs are inside DPs.

However, the evidence for that is a bit complex, and it makes trees a lot *bigger* (because you would *always* have to put a DP on top of every NP), and less intuitive for many students, so for the purposes of this class I will continue to draw NPs with DPs in their specifiers.

On all assignments, we will accept **either** structure, if it's correct—**as long as you're consistent!** You should **not** switch between the two structures on an assignment, even if it's between questions.

5.8 Head direction and language variation

Languages vary in their word order, but this variation isn't random—it isn't the case that anything goes in word order.

One of the advantages of X-bar theory is that it gives us a way to account for some of the ways that word order varies **systematically** across languages, via minimal changes to the **X-bar Template** for a language.

So for example, English has a strict word order of **Subject-Verb-Object** (SVO). This is the second most frequent basic word order found in the world's languages; the *World Atlas of Language Structures* (WALS) reports a basic word order of SVO in 488 languages, out of 1376 surveyed, approximately 35.5% (Dryer and Haspelmath, 2011).

The *most** common basic word order is **Subject-Object-Verb** (SOV), found in 564/1376 languages in WALS (approximately 41.0%).

X-bar theory accounts for this difference very easily, by a simple switch in the **X-bar template** of languages of the two types.

Consider the basic shape of phrases of several categories in English, illustrated in 5.12.

(30) I [**ate** [*an apple*]]

(31) I went [**to** *Toronto*]

(32) This is a [**picture** *of robots*.]

In English it is always the case that **heads** precede their *complements*. This is true of verbs and their objects, prepositions and their noun complements, and nouns and their PP complements.

In contrast to English, Japanese is a strictly **SOV** language. And in Japanese, **heads** always *follow* their complements.[2]

[2] *Note:* In the video I wasn't consistent about "sh" vs. "s"—in Japanese, "s" always sounds like "sh" when it occurs before "i", and in the romanization system I meant to use you therefore never spell "sh" before "i".

(33) Watasi-wa [$_{VP}$ *ringo-o* **tabe-ta**.]
I-NOM apple-ACC eat-PAST
"I ate (an) apple."

(34) [$_{PP}$ *Tokyo* **e**]
Tokyo to
"to Tokyo"

(35) [$_{NP}$ *robotto no* **shasin**]
robot of picture
"picture of (a) robot"

This is the *reverse* of the order we get in English.

What X-bar theory allows us to say is that phrases in Japanese have the same **structure** as phrases in English, but a different **order**.

Specifically, Japanese is **head final**—complements are still the siblings of their heads, but they *precede* the head instead of following it, as illustrated in 5.13.

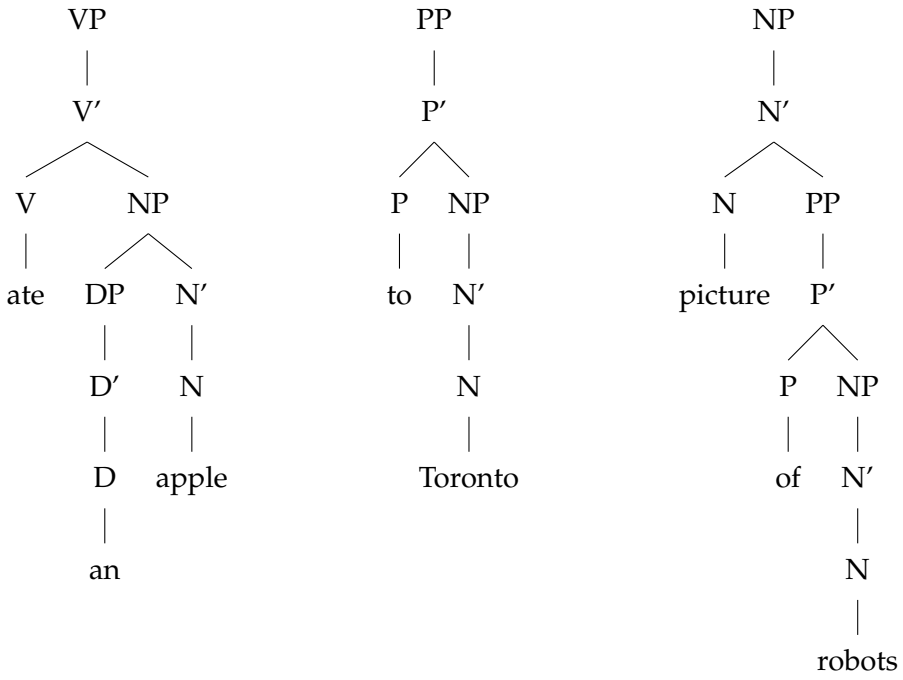


Figure 5.12: Trees for English VP in (30), PP in (31), and NP in (32)

Technically words like *of* in Japanese would be **postpositions** instead of **prepositions**; sometimes the more general term **adpositions** is used. These terms are parallel to **suffix**, **prefix**, and **affix** in morphology. However, in syntax we simply label these all as P (and the phrases as PPs), and I will continue to say "preposition" even when describing head-final languages.

If we draw a tree for Japanese, we would extend this template to TP, as well as all the other phrases we've looked at:

When you're drawing a tree for another language, it's important that the words come in the right order if you read the words off the bottom of the tree!

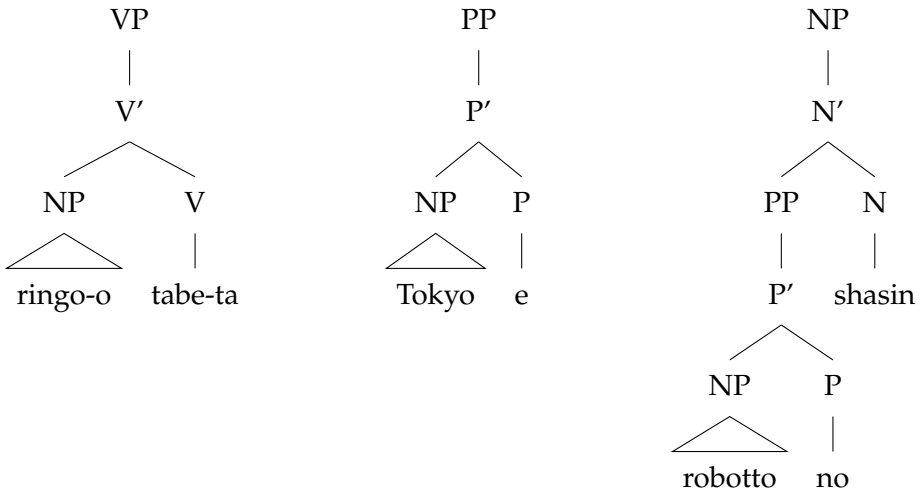


Figure 5.13: Trees for Japanese VP in (33), PP in (34), and NP in (35)

The ability of **heads** to either precede or follow their complements is called **head directionality**. A language can be **head initial** like English, or **head-final** like Japanese.

By contrast, **specifiers** don't show the same variation. They always come before their complements, across all known human languages.

If you're analyzing an unfamiliar language, and need to figure out it's word order, one of the first questions you should ask is whether it appears to be head initial or head final.

Later in the term we'll see other ways to derive differences in word order, involving differences in the **movement** (or *transformations*) available in a language's grammar.

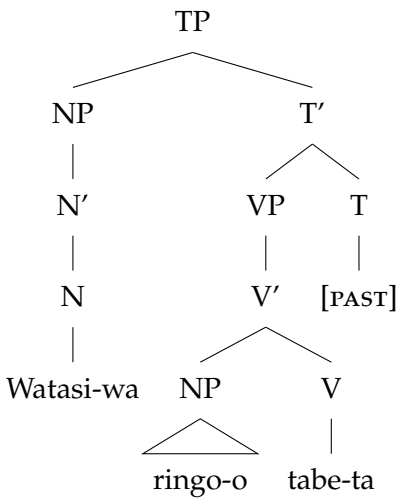


Figure 5.14: Full tree for Japanese sentence in (33) as head-final TP

Chapter 6

Fall Week 6: Modifiers and Embedded Clauses

Contents

6.1 Modifiers as Adjuncts

When we introduced X-Bar theory, we gained the ability to represent the asymmetric relationship between heads and their complements on the one hand, and heads and their specifiers on the other hand.

At the same time, with X-Bar structure as we've had it so far, we lost a bit of empirical coverage that we'd been able to include in phrase structure rules: we lost a place to put **modifiers**:

- AdjPs and NumPs in NPs
- AdvPs in VPs and TPs
- modifier PP in all other phrases

With **adjuncts** we expand X-Bar structure to accommodate modifiers.

The basic idea of adjuncts is that while there can only be one **head** in a phrase, and there can only be one **phrase** (because it's the final projection

of a head), a bar level is a "mid-sized phrase" or "partial phrase", and in principle there can be many partial phrases within a larger phrase.

Let's see how this works in practice. Consider the following noun phrase:

(1) [$_{NP}$ the worst thing about winter]

This NP contains a modifying adjective phrase [worst]. Without that AdjP, the structure would be as in 6.1.

In this NP both the specifier and complement positions are filled, so there's no more space for the adjective phrase [$_{AdjP}$ worst].

But by adding bar levels, we can create space for a modifier—this position, the child and sibling of a bar-level, is an **adjunct** position. The trees in 6.2 show what adjunct positions would look like without any phrases in them.

Unlike specifiers and complements, ad-

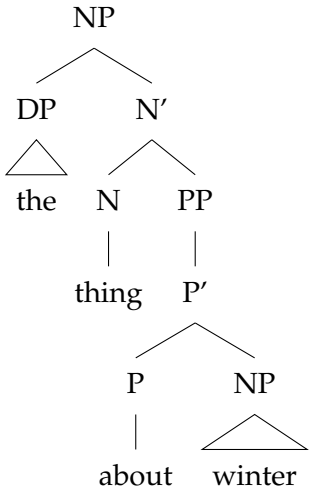


Figure 6.1: Tree for NP *the thing about winter*

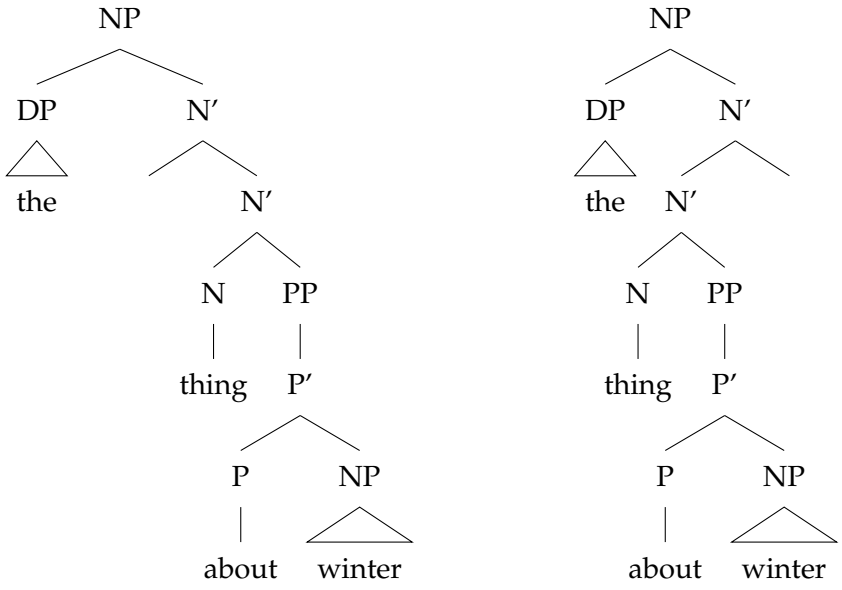


Figure 6.2: Trees for NP *the thing about winter* with empty adjunct positions

juncts are flexible in their position: they can
appear on either the left side or the right size of a phrase structure.

With this additional structural relation, we can represent the modifying AdjP as shown in 6.3

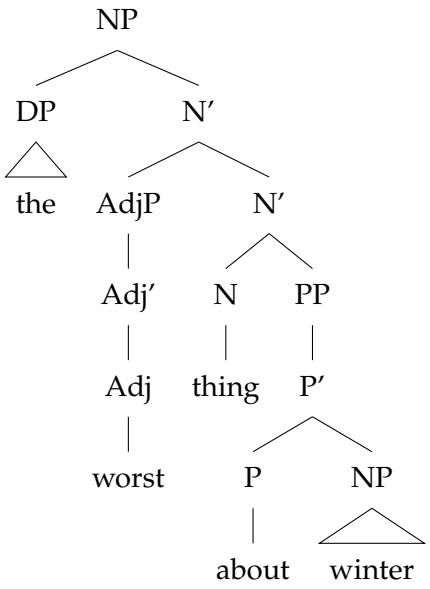


Figure 6.3: Tree for *the worst thing about winter*, AdjP *worst* as an adjunct

The same expansion of X-Bar structure gives us space within an NP to represent **two** PPs after the head noun, as in the tree for (2) in 6.4

(2) a book [$_{PP}$ about linguistics] [$_{PP}$ on a shelf]

Adverb phrases within VP can occur as adjuncts either before or after a verb, as shown in 6.5.

(3) They will [$_{VP}$ [$_{AdvP}$ quickly] leave the room]

(4) They will [$_{VP}$ leave the room [$_{AdvP}$ quickly]]

Any adverb will appear in an **adjunct** position, as will any adjective phrase inside an NP.

PPs sometimes occur as complements, and sometimes as adjuncts.

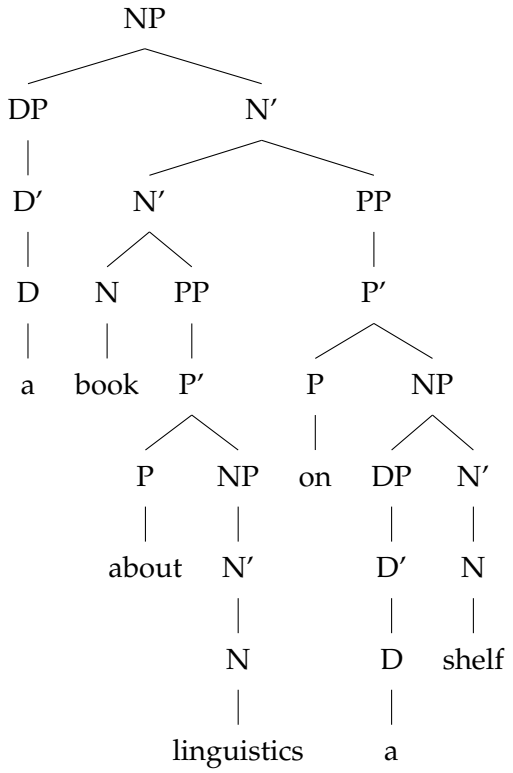


Figure 6.4: Tree for NP in (2)

6.2 Structural Ambiguity

When we talked about compounds, we saw a first example of structural ambiguity: cases where the same string of morphemes can have more than one structure, with each structure corresponding to a different interpretation.

The same thing is found in syntax. Consider the following example:

(5) I saw someone with a telescope.

This has two possible interpretations:

1. I was using a telescope, and I saw someone. (Tree in 6.6)
2. I saw someone, and that person had a telescope. (Tree in 6.7)

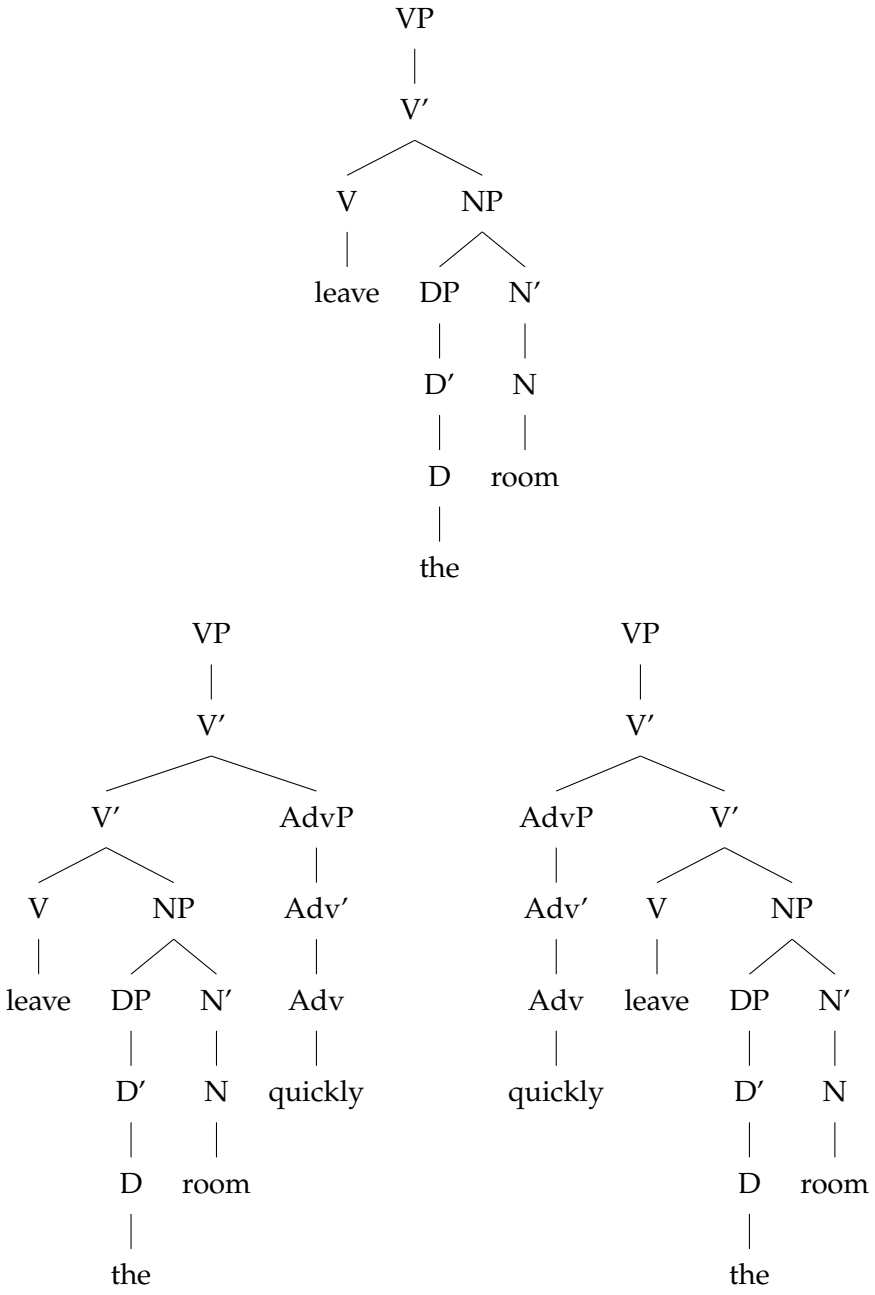


Figure 6.5: Trees for VPs [*leave the room*], [*quickly leave the room*], and [*leave the room quickly*]

In the first interpretation, the prepositional phrase [$_{PP}$ with a telescope] modifies the verb phrase headed by *saw*, as in 6.6.

In the second interpretation, the same prepositional phrase modifies the noun phrase *someone*, as in 6.7.

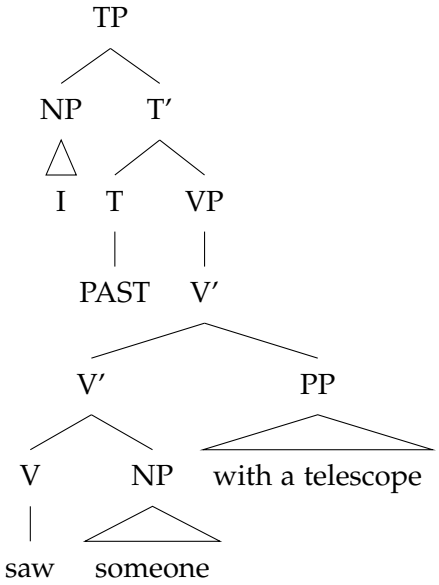


Figure 6.6: (5): PP modifies VP

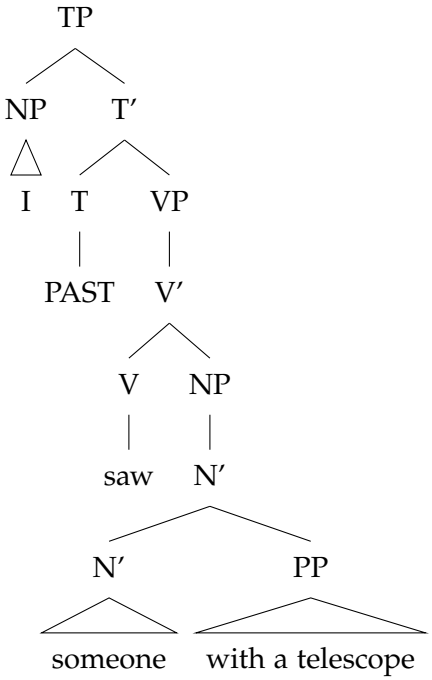


Figure 6.7: (5): PP modifies NP

The same will be true for other cases of structural ambiguity.

6.3 Embedded clauses as CPs

The final topic this week involves **complex sentences**, clauses that contain other clauses inside of them.

Consider two TPs:

(6) Astrid said something.

(7) Atul might leave.

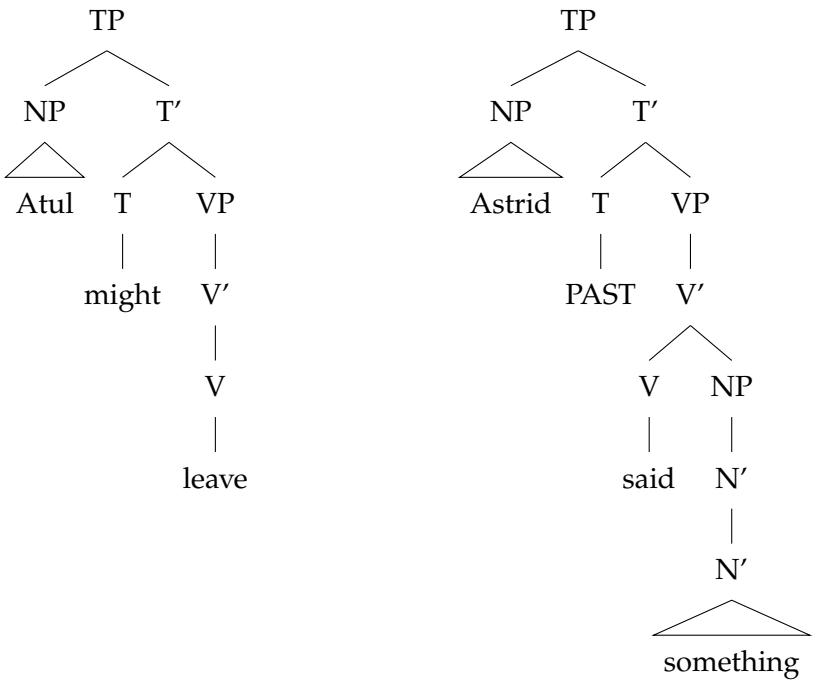


Figure 6.8: Trees for (6) and (7)

In (6), the verb *say* has an NP complement [$_{\text{NP}}$ *something*]. But a verb like *say* can also take a whole sentence as its object, as in (8).

(8) Astrid said **that [$_{\text{TP}}$ Atul might leave]**

In this example, the word **that** turns the TP [$_{\text{TP}}$ Atul might leave] into the complement of the verb [$_{\text{V}}$ say]. This word is our last major functional category: a **complementizer**. The structure of this example is shown in 6.9:

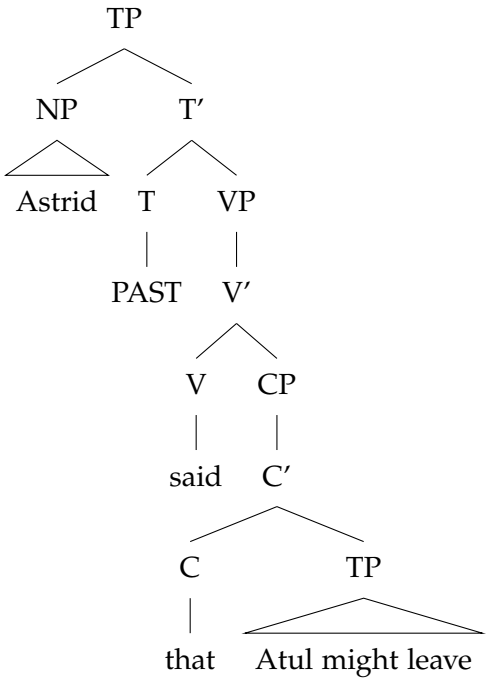


Figure 6.9: Tree for (8), showing embedded clause as CP

The word [$_{C}$ that] is optional in this example; we can also say:

(9) Astrid said [$_{TP}$ Atul might leave]

In this case we'd wouldn't say that there's no CP, but that in English the C head can be null—in Week 8 we'll see other cases where we assume there is an empty C head, because its specifier position is filled. A tree for (9) illustrating a zero complementizer is shown in 6.10.

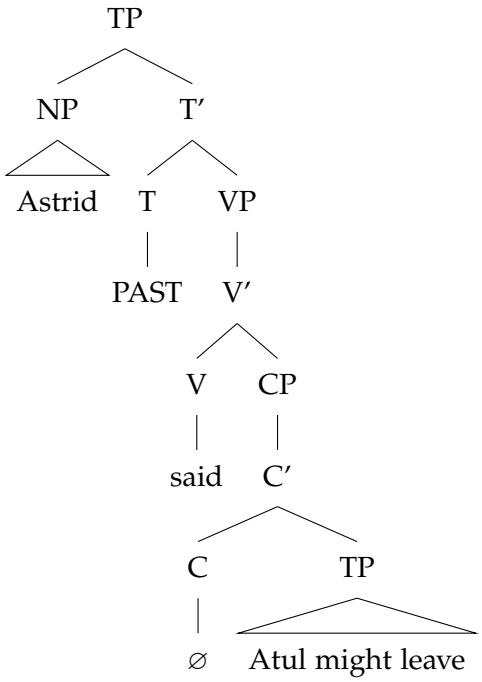


Figure 6.10: Tree for (9), showing zero C head

6.4 ⭐Reference: schemas for phrases in English

We've now seen all the available structural relationships in X-bar theory. We can schematize the types of elements that occur as specifiers, complements, and adjuncts for each phrase type:

- NP
  - Specifier: DP or NP (possessor)
  - Complement: PP
  - Adjuncts: PP, NumP (always to the left), AdjP (always to the left)
- VP
  - Specifier :(AdvP) (*to be revised*)
  - Complement: NP, PP, AdjP, CP

- Adjunct: AdvP, PP

- PP
  - Specifier: DegP
  - Complement: NP
  - Adjunct: (none that we'll see)

- AdjP
  - Specifier: DegP
  - Complement: PP[1]
  - Adjunct: (none that we'll see)

- AdvP
  - Specifier: DegP
  - Complement: PP
  - Adjunct (none that we'll see)

We won't see any specifiers, complements, or adjuncts for DP, DegP, or NumP.

What about full clauses?

- TP
  - Specifier: NP or CP (subject)
  - Complement: VP (predicate)
  - Adjunct: AdvP, PP (adjunct CP)

- CP
  - Specifier: WH-phrase (week 8!)
  - Complement: TP
  - Adjunct: AdvP

In the absence of other evidence, we would assume the same structural relations appear in other languages.

It is a good idea to draw these out as a visual reference for potential structure types!

[1] Recall that one adjective can take NP complements in all varieties of English (*worth*), and some others can take NP complements for some speakers (*finished*, *done*, sometimes others).

Chapter 7

Fall Week 7: Yes-No Questions in Main and Embedded Clauses

Contents

7.1 ★Selection: verbs that select CPs

When first talking about selection, we talked about differences in **transitivity**.

Intransitive verbs don't select anything: they have no complement.

Transitive verbs select one NP complement (a direct object).

Ditransitive verbs select two objects (a direct object and an indirect object).

There are also verbs that take **PP complements**.

With embedded CPs we complete the set of possible complements for verbs. Different verbs can take different types of complements.

For example, the verb *know* can combine with several different types of complements:

(1) They know...
   a. ...this fact. (NP)
   b. ...about ghosts. (PP)
   c. ...that ghosts are scary. (CP)

Other verbs can only take some of these as complements:

(2) We ate...
   a. ...candy. (NP)
   b. *...about pumpkins. (*PP)
   c. *...that pumpkins are in season. (*CP)

(3) Someone said...
   a. ...something. (NP)
   b. ...that they like candy. (CP)
   c. *...about chocolate. (*PP)

(4) Some people fear...
   a. ...the dark. (NP)
   b. ...that they will be haunted. (CP)
   c. *...about spiders. (*PP)

In these examples we see that *eat* can only take an NP complement, while *say* and *fear* can take an NP or a CP but not a PP.

7.2 Embedded Yes-No Questions

Having introduced the idea that some verbs embed whole **clauses**, and these clauses aren't just bare TPs but are instead **complementizer phrases** (CPs).

So far we've only seen CPs headed by **that** or by Ø. But we should ask a couple of questions:

- Are these the only complementizers in English?
- What type of meaning /grammatical information is encoded by C?

∅ is a symbol used in mathematical and logical notation for the empty set—that is, for a set that has nothing in it, {}. This is a slightly different symbol than letter Ø/ø, an O/o with a bar through it, used in Scandinavian languages (Danish, Norwegian, Faroese) and in Sami. It has its own Unicode character (U+2205).
In linguistics, ∅ is used to represent something that we analyze as being there from a syntactic or morphological perspective, but that has a zero pronunciation.

To find some other examples of complementizers, let's look for other cases where a verb introduces an embedded clause. I encourage you to think of some on your own—either in English or in another language!

To cut to the chase, I'm going to use the verb *know*—we saw in the last section that *know* can combine with several different types of complements (CPs, NPs, and PPs), and it also happens to be able to combine with more than one type of CP. Consider:

(5) **know**
   a. I know [$_{CP}$ **that** [$_{TP}$ ghosts exist]]
   b. I know [$_{CP}$ ∅ [$_{TP}$ ghosts exist]]
   c. I know [$_{CP}$ **whether** [$_{TP}$ ghosts exist]]
   d. I know [$_{CP}$ **if** [$_{TP}$ ghosts exist]]

What we see here is that the verb *know* can combine not only with CPs introduced by *that* or nothing, but also ones introduced by *whether* or *if*. Another way to write this would be to use { curly braces } to surround the C heads allowed after *know*, as in:

- **know**
  - I know [$_{CP}$ {that, ∅, whether, if} [$_{TP}$ ghosts exist]]

Not all verbs are equally flexible! Some verbs, like *believe*, only allow *that* or ∅, not *whether* or *if*:

(6) **believe**

a. I believe [$_{CP}$ {that, ∅} [$_{TP}$ ghosts exist]]
b. *I believe [$_{CP}$ {whether, if} [$_{TP}$ ghosts exist]]

Other verbs *only* allow *whether* or *if* as complementizers, like *wonder*:

(7) **wonder**

a. *I wonder [$_{CP}$ {that, ∅} [$_{TP}$ ghosts exist]]
b. I wonder [$_{CP}$ {whether, if} [$_{TP}$ ghosts exist]]

What this tells us is that the difference between *that*/∅ on the one hand, and *whether*/*if* on the other hand, is something that verbs can be sensitive to when it comes to **selection**.

What, then, is the difference between these two sets of complementizers?

We can see the difference if we look at their use with **verbs of quotation**, in comparison with direct quotation (i.e. using quotation marks).

Consider the verb **say**:

(8) **say**

a. They said: "**Ghosts exist.**"
b. They said **that** ghosts exist.

The embedded CP with *that* can directly paraphrase the directly quoted **statement** above it.

Now consider the verb **ask**:

(9) **ask**

a. They asked: "**Do ghosts exist?**"
b. They asked **if** ghosts exist.

Here we see that the embedded CP with *if* corresponds not to a quoted statement, but to a quoted **question**!

This is the difference between *that*/∅ and *if*/*whether*:

- *that*/∅: introduce **embedded statements**
    - they are [–Q] (non-question) C heads
- *if*/*whether*: introduce **embedded questions**
    - they are [+Q] (question) C heads

What do embedded questions look like in a tree? For the most part, just like embedded statements we've seen previously, but with the complementizer *if* (or *whether*) instead of *that*, as shown in 7.1.

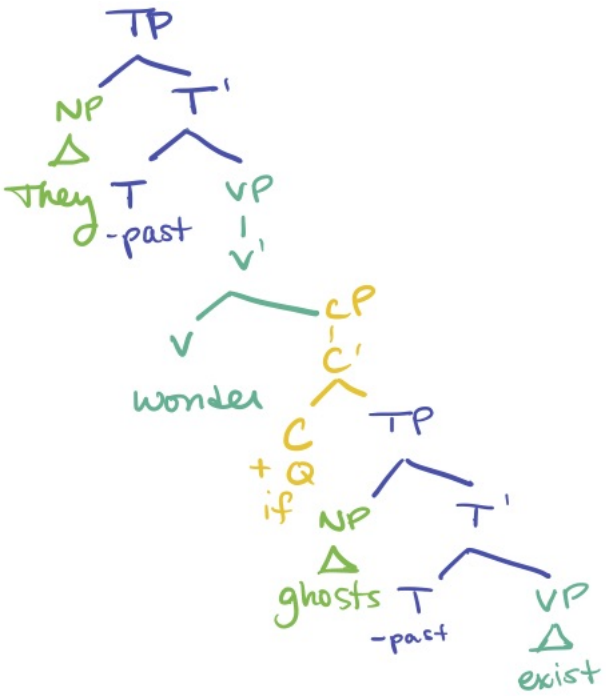


Figure 7.1: Tree for *They wonder if ghosts exist.*

In English, all verbs that can select a CP headed by *whether* can also select a CP headed by *if*, though some speakers prefer one or the other, or prefer one to the other for certain verbs. If you're a fluent English speaker, do you prefer one of these words to the other one?

The relationship between *that* and ∅ is slightly more complex. For the most part, any verb that can select a CP headed by *that* can also select a CP headed by ∅. But there are a few verbs that strongly prefer an overt *that*—for many English speakers, an example is the verb *report*:

(10) The newspaper reported that there was a demonstration yesterday.

(11) ??The newspaper reported ∅ there was a demonstration yesterday.

7.3 Embedded Nonfinite CPs

Are CPs all just questions or statements?

There's at least one other distinction in types of clauses that verbs can take as complements. Consider, for example, the verb *want*:

(12) **want**

a. I want [ghosts to exist.]
b. *I want {that/∅} ghosts exist.
c. *I want {whether/if} ghosts exist.

The verb *want* doesn't allow any of the complementizers we've seen so far, but requires that the clause it embeds be **nonfinite**.

Are embedded nonfinite clauses also CPs, or are they just bare TPs?

It looks like these are CPs: while many nonfinite embedded clauses don't have any overt complementizer, at least some do—at least for some English speakers. Consider the following examples:

(13) a. I want **for** [ghosts to exist.]
b. I prefer **for** [my coffee to have milk in it.]
c. I'd like **for** [you to leave now.]

Not everyone likes *for* in these examples, but it's good for at least some English speakers. Here *for* appears in the same kind of position we previously saw *that*, *if*, or *whether* in. We analyze *for* as a **complementizer for nonfinite clauses**.

What does this look like in a tree? The example in (13a) is illustrated in 7.2.

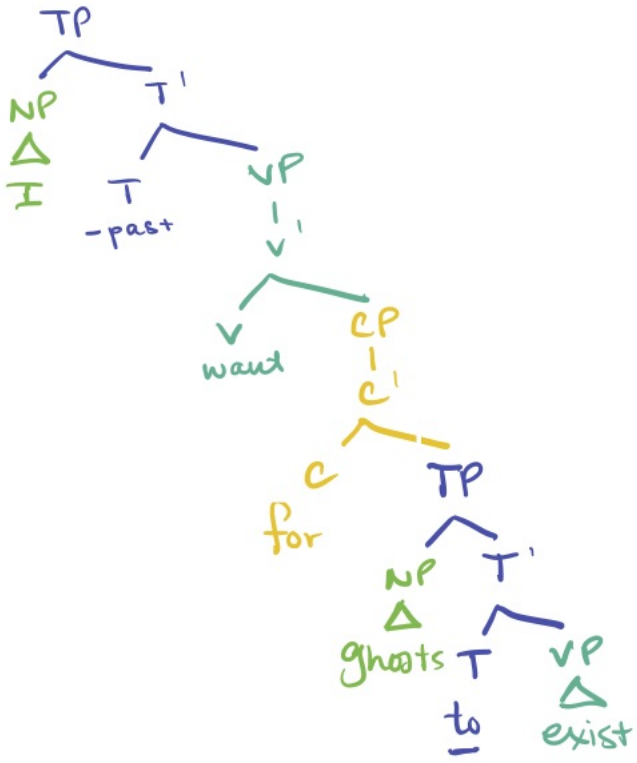


Figure 7.2: Tree for (13a): *I want for ghosts to exist.*

Some verbs can take *either* finite or nonfinite complements! Consider the verb *prefer*:

(14) **prefer**

a. I prefer **that** [cookies have chocolate chips.]
b. I prefer **for** [cookies to have chocolate chips.]

So just like the verb *know* can select either a question or a statement as its complement, the verb *prefer* can select either a finite statement or a non-finite clause.

"Nonfinite" and "infinitive" are two words for the same thing—notice that in both cases a negative prefix (*non-* or *in-*) attaches to the root *finite*.

Nonfinite verbs in English appear with the infinitive marker *to*. This is a T head—the **last** T head we'll encounter in LING 100.

7.4 Main Clause Yes-No Questions

So far we've seen **embedded questions**, introduced by *whether* or *if*, but what about actual questions—ones that end in a question mark? How do we accommodate those in our syntactic theory?

Let's start with **Yes-No Questions**—questions whose answer in English can be "yes" or "no". Consider first of all the following statements:

(15) a. It will rain.
b. They have left.
c. Ghosts are haunting this house.

We can turn these into questions as follows:

(16) a. **Will** it rain?
b. **Have** they left?
c. **Are** ghosts haunting this house?

The questions are related to the corresponding statements in a consistent way. As a first approximation, we could say:

(17) **Yes-No Question Formation in English** (to be revised)
Yes-No Questions are formed by moving the auxiliary in T to the front of the sentence (i.e. before the subject).

This is also known as **Subject-Auxiliary Inversion** (or Subject-Aux Inversion).

This is the first **transformation** we've seen in syntax. A transformation is a rule that changes the structure of a sentence in a predictable way, by reordering the constituents.

Thinking not in terms of the linear order of the subject and the auxiliary, but instead in terms of our X-Bar structure, how could we state this transformation more precisely?

If we draw the tree for "*They have left.*" it will look like this:

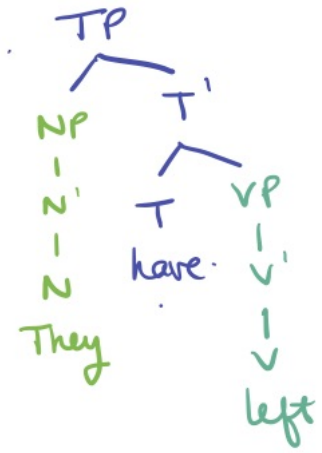


Figure 7.3: Tree for *They have left.*

This tree represents the grammatical relationships between different elements—we don't want to fundamentally change the relationship between the subject, the TP, and the predicate in a question, we just want to add the information that instead of making a statement we're asking a question.

The simplest way to change the order of the subject and the auxiliary is to **move** one of them. We could either move the auxiliary up and to the left, or move the subject down and to the right.

(It is hard to show this with still images, so if you're not sure what I mean here, I recommend watching content video 7.2—you can skip to 4:20

to see the two options for movement animated.)

For a variety of reasons we will adopt the first of these options: moving the auxiliary up and to the left, as in 7.4.

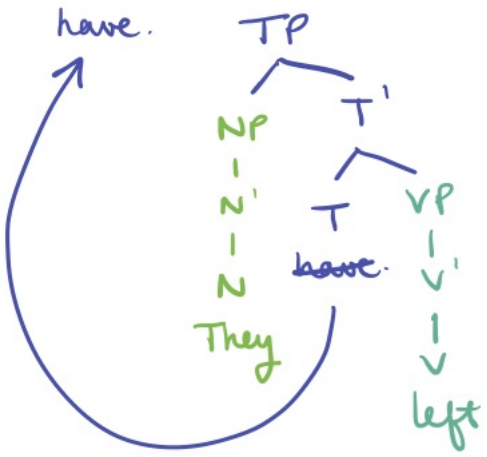


Figure 7.4: Towards a tree for *Have they left?*

But where does the auxiliary move **to**? It can't just float out in space, it has to connect to the tree somehow.

Conveniently, in the previous section we just finished arguing that in *embedded* clauses there is in fact a functional projection above T, that is responsible for distinguishing questions from statements! This same projection, CP, provides a potential landing site for the **movement** of the auxiliary, shown in 7.5.

This is **head movement**: moving a head to a higher head in the tree. We can now restate the generalization about how Yes-No Questions are formed in English main clauses:

(18) **Yes-No Question Formation in English** Version 2 (to be revised)
Yes-No Questions are formed by **moving the auxiliary in T to C.**

We can specify a particular type of head movement by naming the places you move between. So the movement we see in English questions is called **T-to-C movement.**

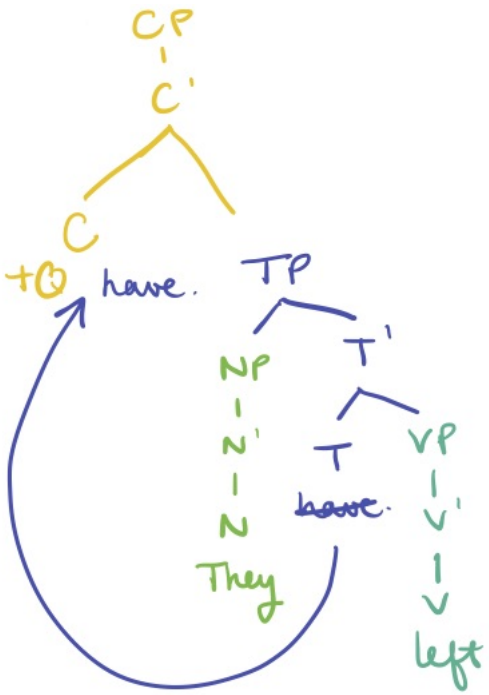


Figure 7.5: Tree for *They have left.*

7.4.1 ★Aside: notation to indicate movement

In this class, when something moves we will use {–strikethrough–} notation and an arrow.

For **head movement** you should cross out the content of the lower head, and re-write it in the higher head that it has moved to. You should connect the two positions with an arrow, to indicate that movement has taken place.

This is the same notation used in the textbook.

There are other ways of indicating movement, which you might encounter online or in other resources. These include *trace notation*, where the original position of the moved element has a "trace" (written *t*) left in it. This can be thought of as a variable, or as the empty space left behind by the thing that moved—but you should not use trace notation in LING 100.

7.4.2 ⭐Embedded Questions, Main Clause Questions, and Punctuation

What are we doing in conversation when we use main clause questions vs. when we use embedded questions?

If you're talking to someone and you produce a main clause question—"Do you like chocolate?"—you are actually **asking a question**, usually hoping that the person you're talking to will answer it!

In English we indicate this with punctuation: questions have to end with a question mark (?), while other sentence types end with either a full stop (.) or an exclamation point (!).

But if you're talking to someone and you produce a sentence with an embedded question—"They asked if I like chocolate."—you're not actually asking the question yourself. Instead you're **reporting** on what someone else said, what they believe, or maybe what they know. These sentences **do not end with a question mark, because the sentence as a whole isn't a question.**

Now that we have both main clause questions **and** embedded questions, though, we can combine them! Consider a sentence like the following:

(19) They should know that ghosts exist.

We can turn the **embedded** clause into a question:

(20) They should know whether ghosts exist.

Or we could make the whole sentence a question, but leave the embedded clause as a statement:

(21) Should they know that ghosts exist?

Or we could do both at once!

(22) Should they know whether ghosts exist?

In this last example, we would have a [+Q] C head in both the main clause and the embedded clause. In the main clause this [+Q] C triggers T-to-C movement of the auxiliary *should*, while in the embedded clause it is pronounced as *whether*.

Finally: it is important to remember that question marks, as punctuation, don't occur in syntactic trees! Punctuation is part of the convention of writing, but there's no '?' in our tree, in English or in any other language.

7.4.3 Where we are: X-Bar Structure + Movement

We've now expanded our theory of syntax a little bit further. It now consists of X-Bar Theory as well as the operation Move.

X-Bar Theory accounts for the overall shape of trees in individual languages—it describes possible and impossible tree shapes for a given language.

Movement is a theory about how you can change (or **transform**) an existing syntactic tree once you have built it. Adding movement to our tree allows us to expand the explanatory power of our syntactic theory in two ways:

1. We have a new tool for talking about differences across languages in terms of word order: while X-Bar Theory offers the variation of head-initial vs. head-final word order, Movement allows us to say that languages transform their basic word order in different ways (or in different contexts).

2. We can talk about relationships between different sentence types—between statements and questions, or between the basic order of a sentence and one where some phrase has been **topicalized** or **fronted**.

If you're not sure what topicalization is, consider the following two sentences:

(23) a. I like reading books.
b. Reading books, I like. (. . . reading academic articles, not so much)

These sentences are clearly related to one another! We don't want to generate totally different X-Bar trees for each one—that would imply that the basic predicate-argument relationships are different in the two cases.

By introducing movement into our theory, we have a way of talking about the fact that [reading books] in the second sentence has been **displaced**: it is pronounced in a different position than it "belongs", in some sense.

As we move through the rest of our unit on syntax, we'll see more cases where we can account for differences between languages by postulating movement—though first, in Week 8 we'll introduce a second kind of movement, **phrasal movement** (movement of whole XPs, rather than of heads by themselves).

7.4.4 Do-support

There's one last piece we have to discuss with regard to question formation in English, which is: **what do we do when there's no auxiliary in T?**

Consider the sentence (which you're probably getting very tired of):

(24) Ghosts exist.

All that's in T in this sentence is a [–past] feature. But when we form a question, suddenly an auxiliary appears!

(25) Do ghosts exist?

Where does this *do* come from?

Generally, in English in contexts that require an auxiliary for a grammatical reason, if there's wasn't already an auxiliary in T then the auxiliary *do* shows up to give you the auxiliary you needed. This is true in questions as well as with negation:

(26) a. Ghosts don't exist.
b. *Ghostsn't exist.

If there's already an auxiliary, however, you don't get to add *do* for free in the same way:

(27) They have left.
a. They haven't left.
b. *They didn't have left.
c. Have they left?
d. *Did they have left?

7.4.5 Question Intonation

There's another way to form Yes-No Questions in English, without doing any movement at all. This is by using **question intonation**: just pronouncing the sentence "as though it had a question mark."

So for example, alongside:

(28) Do ghosts exist?

In some contexts I might just say:

(29) Ghosts exist?

Questions like this are a bit more restricted than questions formed by **T-to-C** movement. Try to think of the contexts in which you might say "Ghosts exist?" instead of "Do ghosts exist?"—while sometimes you could say either one, "Ghosts exist?" is slightly better in contexts where you're asking someone to repeat themselves, or possibly expressing surprise.

If we wanted to draw a tree for examples like this, we would just put a [+Q] feature in C—and nothing else! The "question intonation" might be thought of as a way of pronouncing this feature, in the absence of any specific word.

7.5 ★Crosslinguistic Variation in Yes-No Questions

Not all languages use T-to-C movement in questions! Many languages instead use a fixed **question word** to mark Yes-No questions, sometimes called a **question particle**.

For example, one of the more common ways to form a Yes-No question in French is to add *est-ce que* to the beginning of the sentence:

(30) Nous avons trouvé les fantômes.
We have found the ghosts
"We have found the ghosts."

(31) **Est-ce que** vous avez trouvé les fantômes?
+Q you.PL have found the ghosts
"Have y'all found the ghosts?"

The particle *est-ce que* looks like multiple words—historically it could be translated as "is it that"—but it acts in contemporary French like a single word, which we could hypothetically think of being spelled "eska".

French has another way of forming questions that **does** involve movement to C. Alongside the examples above, you can also say:

(32) **Avez-vous** trouvé les fantômes?
Have-you found the ghosts
"Have y'all found the ghosts?"

This way of forming questions is someone old-fashioned in most varieties of spoken French, however. The more common strategy today is to use a question particle like *est-ce que*—or to just use question intonation!

We can treat *est-ce que* as a [+Q] C head that occurs in main clauses—exactly as though we marked questions in English by just adding *whether* or

if to the beginning of the sentence.

Japanese also forms questions by adding a question particle—but because Japanese is head-final, the particle appears at the **end** of the sentence:

(33) Gakusei-wa yuurei-o mitsuketa.
Student ghost found
"The student found the ghost."

(34) Gakusei-wa yuurei-o mitsuketa **ka**?
Student ghost found **+Q**
"Did the student found the ghost?"

Similarly, Mandarin forms questions with the particle *ma*:

(35) wàimiàn zài xià yǔ
outside PROG fall rain
"It is raining outside."

(36) wàimiàn zài xià yǔ ma
outside PROG fall rain **+Q**
"Is it raining outside?"

(Mandarin examples from Liing 2014)

The analysis of Mandarin is a little bit more complicated, though. First of all, the particle appears at the **end** of the sentence in Mandarin, like in Japanese, even though Mandarin is otherwise head-initial, like English and French. Second, there are several other ways to ask questions in Mandarin, which are equally (if not more) common than adding the particle *ma*.

Overall, it is very common for languages to form questions by adding a particle to the beginning or end of a sentence—but it is also very common to form questions via head movement of the type we see in English!

Chapter 8

Fall Week 8: WH-Questions

Contents

This week we finish our discussion of questions by discussing **WH-questions**, which we can also call **Content questions**.

We also begin looking at cases of movement outside of questions, specifically **V-to-T head movement**.

8.1 WH-Questions

Until now we've only talked about Yes/No-questions—questions that can be answered by saying "yes" or "no" in a language like English.[1]

[1]Not all languages have words corresponding to "yes" and "no"! In many languages, the way you answer a Yes/No–question is by repeating the verb with or without negation. For example to answer *Is it raining?* you could say *Is.* or *Isn't*. This is the case in Mandarin, for example, as well as in Irish.

(1) **Is it snowing?** (Main clause Y/N-Question)

(2) They asked **if it's snowing**.

Yes-No questions like these just ask whether something is or is not the case. But we can ask more complex questions, asking for specific information about *part* of a sentence. For example:

(3) **When** was it snowing? (asking about *time*)

(4) **Where** is it snowing? (asking about *location*)

These are sometimes called **Content questions**, but in English we usually call them **WH-questions**, simply because they all involve question words that start with (or at least contain) the letters "wh".

- who
- what
- where
- when
- why
- which
- . . . how (which at least *has* both a "w" and an "h")

These are all called **WH-words**—even when we're talking about other languages, where they don't start with those letters! But in many languages question words like these do tend to start with some of the same sounds. For example, in French many (though not all) of these words begin with "qu-":

- *qui* (who)
- *quoi* (what)
- *quand* (when)
- *quelle* (which)

And in Anishinaabemowin many of them start with "a-" or "aa-" (or they did historically—this initial vowel isn't pronounced in many varieties):

- *awenen* (who)
- *awegonen* (what)
- *aanapii* (when)
- *aaniin* (how, why, in what way)
- *aandi* (where)

All languages have ways of asking this type of question, just like all languages have ways of asking Y/N-questions.

Unlike Y/N-questions, the answer to a WH-question would be a word or phrase corresponding to the WH-word that was used. If someone asks:

(5) Who were you talking to?

Even though this is a question, it wouldn't make any sense to answer with *yes* or *no*! Instead the answer would be an NP like "my friend" or "the person over there" or "Vera", or with a full sentence ("I was talking to the person over there /Vera /my friend.")

8.1.1 The syntax of WH-Questions

What's the syntax of WH-questions in English? Just like Y/N-questions, these involve a **change in word order** from what we find in statements, but we'll see that we can't describe the change *just* in terms of Head Movement. Instead, we're going to introduce a second (and final) type of movement: **Phrasal Movement**.

But before worrying about the *kind* of movement, let's focus on seeing the difference in word order in the first place. Consider the following very short dialogue:

(6) a. A: That squirrel has hidden **something**.
b. B: **What** has the squirrel hidden?

By asking the question with *what*, Person B is asking for more information about the *something* Person A mentioned. But instead of going after the verb in the usual object position, the WH-word goes at the very beginning of the sentence.

We find the same thing with **all** WH-questions: no matter where the phrase we ask about would show up in a statement, the WH-word has to go at the beginning of the sentence in English:

(7) a. **Where** is it snowing?
b. It's snowing **in Ottawa**.
c. *It's snowing where?

(8) a. **When** was it snowing?
b. It was snowing **yesterday**.
c. *It was snowing when?

(9) a. **How** do squirrels hide nuts.
b. Squirrels hide nuts **by burying them**.
c. *Squirrels hide nuts how?

Echo questions: when the WH-word can stay in place.
A sentence with a WH-phrase in the same position as the phrase it's asking about is called **WH-in-situ**. In many languages, as we'll see later, all WH-questions look like this!
In English these aren't possible as a default way to ask someone for information—a genuine question—which is why they're marked as ungrammatical above. However, they can be used in some contexts to ask what are called **echo questions**—when you didn't quite hear what someone said, you can use an echo question not to ask for information, but to ask someone to repeat themselves.

All these WH-questions also involve **Subject-Aux Inversion**, which we analyzed as **T-to-C movement** when looking at main clause Y/N-Questions. We can tell this has applied because the auxiliary is **before** the subject in all the WH-questions.

But we can't use T-to-C movement to analyze how the WH-word gets to the front of the sentence, for two reasons:

1. The auxiliary is already in C! We can't put two words in one head, so we need to put the WH word somewhere else—and somewhere higher up!

2. The thing that moves to the front of the sentence in a WH-question isn't just a head, it's a whole phrase!

How can we tell that what moves is a whole phrase? We can tell by looking at a possible continuation of our dialogue between Person A and Person B:

(10) A: That squirrel has hidden something.
B: What has the squirrel hidden?
A: It's hidden **nuts.**
B: **What kind of nuts** has it hidden?

Here instead of the single word *what* (which is technically an *interrogative pronoun* or *WH-pronoun*), we have a whole NP *what kind of nuts*. Here *what* is instead a determiner, occurring in the same position that *this* or *the* or *a* would occur.

So we know that the WH-phrase isn't showing up in C—so where **is** it showing up?

To answer this question, let's consider the word order for the statement The squirrel has hidden nuts. The auxiliary has is in T, and the object nuts is the complement of the verb hidden. We can represent this in a labelled bracket structure:

(11) $[_{TP}\ [_{NP}$ the squirrel $]\ [_{T'}\ [_{T}$ has $]\ [_{VP}\ [_{V'}$ hidden $[_{NP}$ nuts $]\ ]\ ]\ ]$

This structure is also the Deep Structure that underlies the WH question. What changes is the presence of a +Q (and +WH) feature on C, and the replacement of the ordinary NP nuts with the +WH NP what.

(12) $[_{CP}\ [_{C'}\ [_{C}$ +Q +WH $]\ [_{TP}\ [_{NP}$ the squirrel $]\ [_{T'}\ [_{T}$ has $]\ [_{VP}\ [_{V'}$ hidden $[_{NP}$ what $]\ ]\ ]\ ]$

Now we need to transform this clause so that the WH-phrase appears in initial position, at the beginning of the sentence. This isn't head movement, it's **Phrasal Movement**, also referred to as **XP Movement**. A phrase can't go in a head position, but it can move to the empty Specifier position in CP!

Phrasal Movement: Movement of a phrase (XP) into a higher specifier position.

Specifically, this type of Phrasal Movement is known as WH-movement:

WH-movement: Move a WH-phrase from its original position into Spec,CP

Here's what the Surface Structure looks like after WH-movement has applied, using bracket notation in (13) and as a full tree in 8.1.

(13) [$_{CP}$ [$_{NP}$ what] [$_{C'}$ [$_{C}$ has +Q +WH] [$_{TP}$ [$_{NP}$ the squirrel] [$_{T'}$ [$_{T}$ has] [$_{VP}$ [$_{V'}$ hidden [$_{NP}$ what]]]]

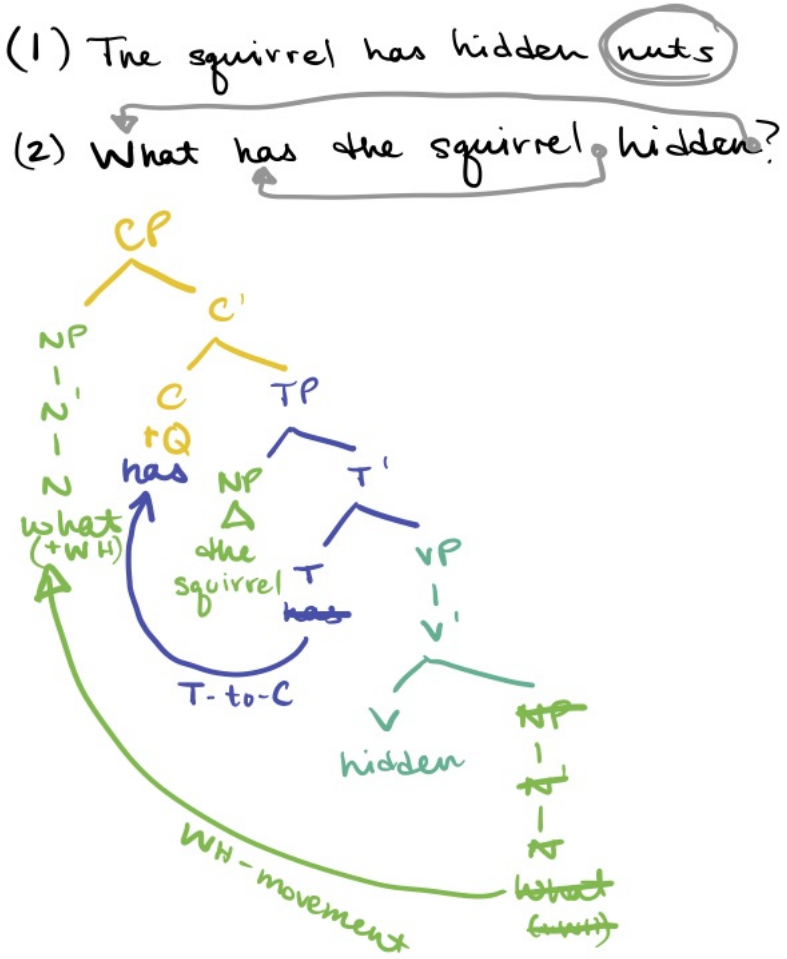


Figure 8.1: Tree for (13) WH-Question

What does it look like when we have a **complex NP** moving to Spec,CP? Basically the same, as shown in 8.2.

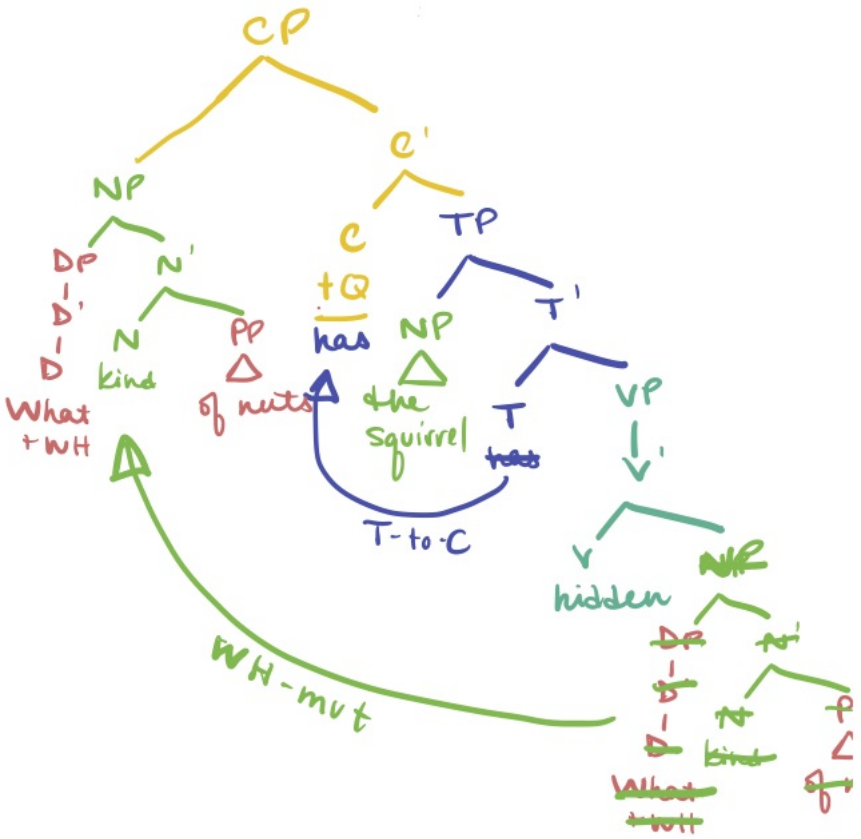


Figure 8.2: Tree for *What kind of nuts has the squirrel hidden?*

8.1.2 Cross-linguistic Variation in WH-questions

Just as not all languages have T-to-C movement in Questions, not all languages have WH-movement. Languages without WH-movement are sometimes called **WH-in-situ languages**, because their WH-phrases remain in place.

Japanese, for example, is a WH-in-situ language. Question words like *nani* ("what") are pronounced in the same place as the corresponding non-question arguments are.

(14) Usagi-wa nani-o tabe-ru ka
rabbit-TOPIC what-ACC eat-PRESENT Q

"What do rabbits eat?"

(15) Usagi-wa yasai-o tabe-ru
rabbit-TOPIC vegetables-ACC eat-PRESENT
"Rabbits eat vegetables."

Notice that the word order in the Japanese WH-question is different than the English word order! This is partly because Japanese is head-final (so the verb comes at the end) and partly because the word *nani-o* does not change position via WH-movement.

The **question particle** *ka* also appears in this WH-question, just like it does in Y/N questions in Japanese!

(16) Usagi-wa yasai-o tabe-ru ka
rabbit-TOPIC vegetables-ACC eat-PRESENT Q
"Do rabbits eat vegetables?"

It's tempting to think of this question particle as being like the English auxiliary *do*, but remember that *do* only shows up in English when there's no other auxiliary. The question particle in a language like Japanese (or French, or Mandarin) is more like the English complementizers *if* or *whether*, except found in main clauses.

8.2 Embedded WH-questions

On our tour of questions and statements in main and embedded clauses in English, we have so far seen:

- Statements
  - Main clauses (nothing going on in CP)
  - Embedded clauses (C = *that* or ∅)
- Y/N Questions
  - Main clauses (T-to-C movement of an auxiliary)
  - Embedded clauses (C = *if* or *whether*)
- WH Questions
  - Main clauses (T-to-C movement of an auxiliary **and** WH-movement)

All that remains to complete this picture are WH-questions in embedded contexts.

Where do we find embedded WH-questions? As it turns out, any verb that allows a Y/N question CP can also combine with a WH-question CP. Let's see some examples:

(17) a. Statement: Squirrels hide nuts.
b. Embedded statement: I know [$_{CP}$ that squirrels have hidden nuts.]
c. Embedded Y/N-question: I know [$_{CP}$ if squirrels have hidden nuts.]
d. **Embedded WH-question**: I know [$_{CP}$ what squirrels have hidden.]

What's going on in this last example? First of all, we do **not** see the complementizer *if* that is found in embedded Y/N-questions—and it's ungrammatical if we try to include it, no matter what order it goes in:

(18) a. *I know what **if** squirrels have hidden.
b. *I know **if** what squirrels have hidden.

So there's no *if* complementizer in an embedded WH-question in English. What about T-to-C movement? There's no T-to-C movement in *I know what squirrels have hidden.*—the auxiliary *has* stays after the subject *squirrels*—but is T-to-C movement possible? It turns out that it's not:

(19) *I know [$_{CP}$ what have squirrels hidden.]

So it looks like embedded WH-questions—at least in the variety of English I speak—are **like** main clause WH-questions in putting the WH-phrase at the front of the CP, but **unlike** main clause WH-phrases in that they don't do Subject-Auxiliary Inversion (T-to-C movement).

What would this look like in a tree?

8.3 shows a tree for the sentence: *I know what squirrels hide.*

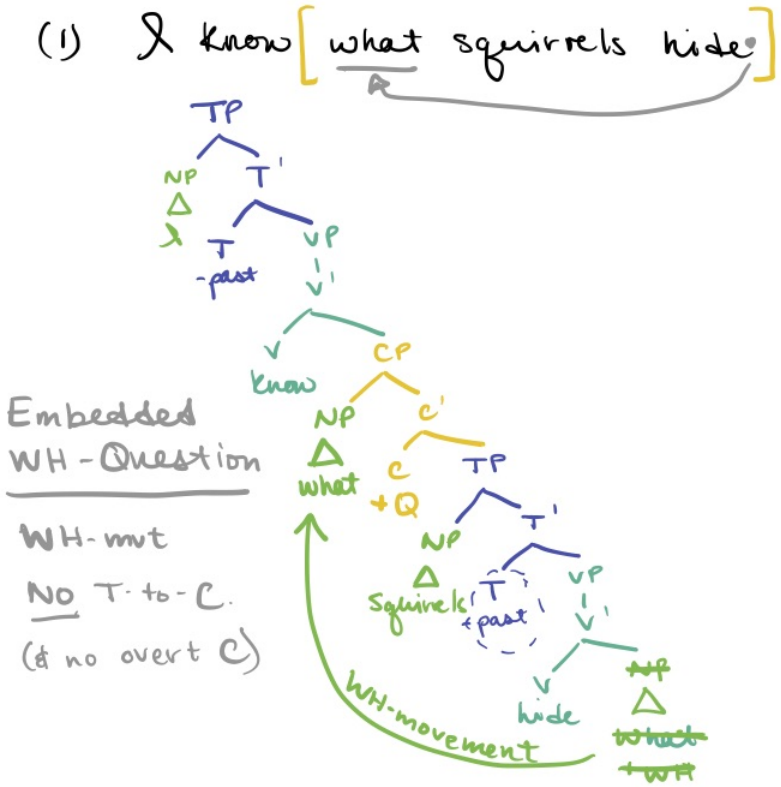


Figure 8.3: Tree for *I know what squirrels hide.*

When you see a WH question, try undoing the WH–movement as a kind of practice! So the question *What would this look like in a tree?* would end up being: *This* ***would*** *look like* ***what*** *in a tree?* (bolded words are the ones that moved).

There are some varieties of English where sentences like this, with T-to-C movement in embedded clauses, are grammatical! This has been described for some varieties spoken in Belfast, Ireland, for example, as described by Henry (1995).

The syntactic theory we've developed in LING 100 predicts that this type of variation should be possible! If one language or variety has a type of movement in some context, then other languages or varieties might have that same movement in other contexts—but also might lack that type of movement altogether.

8.3 Summary of CP in questions

We're now in a position to summarize what all questions look like in English!

Table 8.1: English Questions: what's in C (and what moves)

	Clause Type	
	Main Clause	**Embedded Clause**
Y/N Qs	C: auxiliary (T-to-C)	C: if / whether (no movement)
WH Qs	C: auxiliary (T-to-C + WH-mvt)	C: ∅ (WH-mvt)

8.4 Head Movement outside questions: V-to-T movement of auxiliaries

8.4.1 Part 1: English auxiliaries

The following sentences all have an auxiliary in them:

(20) a. The leaves **will** fall.
b. The leaves **have** fallen.
c. The leaves **are** falling.

Earlier in the term we saw that all these auxiliaries—modals and non-modal auxiliaries—have the same **distribution** in English sentences, a distribution that is different from main verbs

1. They appear before negation.

   (21) a. The leaves **will *not*** fall.
   b. The leaves **have *not*** fallen.
   c. The leaves **are *not*** falling.

2. They appear before adverbs like *always*

   (22) a. The leaves **will *always*** fall.
   b. The leaves **have *always*** fallen.
   c. The leaves **are *always*** falling.

3. They participate in Subject-Auxiliary inversion

   (23) a. **Will** the leaves fall?
   b. **Have** the leaves fallen?
   c. **Are** the leaves falling?

We explained this similarity in distribution—and the way the auxiliaries are all different from main verbs—by analyzing all the auxiliaries as belonging to a single syntactic category: **T**.

But it turns out that the picture is a bit more complex! There's a difference between modals (and nonfinite *to*) on the one hand, and all the other auxiliaries on the other:

Modals (and *to*) cannot **stack**, in most varieties of English—you always get exactly one of them.

(24) a. *The leaves **will might** fall.
b. *The leaves **must will** fall.

By contrast, *have* and *be* **can stack**, with a modal or with each other! And the order is always the same: the modal **must** be the highest auxiliary, the one that shows the distribution that we associated with the head T.

(25) a. The leaves **will have** fallen. (Future + Perfect)
b. The leaves **will be** falling. (Future + Progressive)

c. The leaves **will have been** falling. (Future + Perfect + Progressive)
d. The leaves **have been** falling. (Perfect + Progressive)

If we check all these sentences for the distributional properties that we've associated with being in T—being before negation + adverbs like *always*, undergoing subject-auxiliary inversion—it turns out that only the **first** auxiliary passes those tests! All the subsequent auxiliaries suddenly have the same distribution of main verbs. Let's see this for the Future + Perfect:

- *will* is in T:
  - Before negation: The leaves **will not** have fallen.
  - Before *always*: The leaves **will always** have fallen.
  - Subject-Aux inversion: **Will** the leaves have fallen?
- *have* is **not** in T:
  - Not before negation:
    - *The leaves will haven't fallen.
  - Not before *always*—or at least not as good
    - ?*The leaves will have always fallen.
  - Can't invert, alone or with *will*
    - *Have the leaves will fallen?
    - *Will have the leaves fallen?

So where is the second auxiliary—or in the Future + Perfect + Passive, where is the **third** auxiliary?

Proposal (for English): Only tense features, the modals, and nonfinite *to* are born in T—that is, only these morphemes truly belong to the syntactic category T.

All other auxiliaries **move** to T, but they only do so if that T isn't already filled by a modal or *to*.

This is V-to-T movement.

So when there's a modal in T, the lower auxiliary will appear in an extra VP layer—sometimes called a VP "shell":

Figure 8.4: Tree for *The leaves will be falling*.

But if there's nothing in T—or rather, if all that's in T is a tense feature—the auxiliary verb will **move** from V to T:

Very few verbs move in most contemporary varieties of Modern English! Only:

- *be* (both auxiliary and main verb)
- auxiliary *have* (**not** main verb *have*)

The same isn't true in other languages, necessarily! For example in French (and in earlier stages of English), we have reason to think that **all** verbs move to T.

8.4.2 Part 2: V-to-T in French

In contemporary English it's only *auxiliaries* that ever appear in T—main verbs always show a different distributions.

But in French—and in earlier stages of English—when there's **no** auxiliary the main verb also appears in the T position!

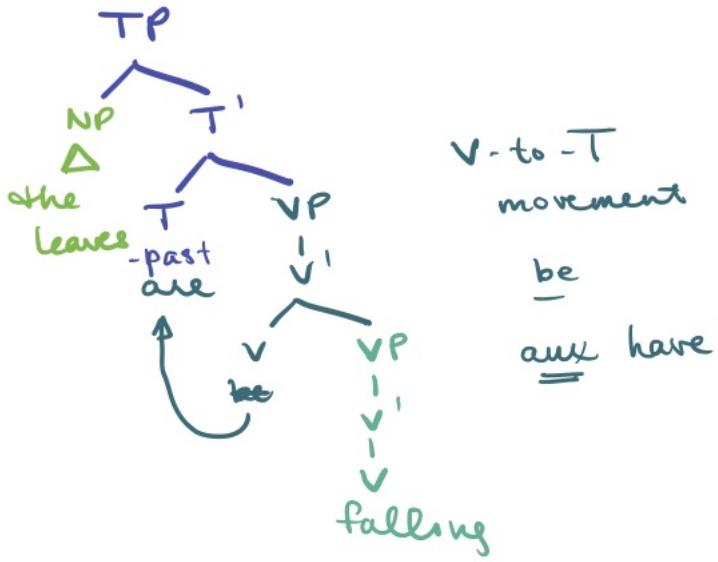


Figure 8.5: Tree for *The leaves are falling.*, with V-to-T movement of *are*

French auxiliaries, like English auxiliaries, show up before negation, before auxiliaries like *toujours* ("always"), and can undergo Subject-Aux inversion (though only with pronominal subjects):

(26) a. Les feuilles ont tombé.
the.PL leaves have fallen.
"The leaves fell / have fallen."

b. Les feuilles (n')ont pas tombé.
the.PL leaves (NEG)have NEG fallen.
"The leaves didn't fall / haven't fallen."[2]

c. Les feuilles ont toujours tombé.
the.PL leaves have always fallen.
"The leaves have always fallen."

d. Ont-ils tombé?
have-they(M) fallen

[2]Negation in French is traditionally described as involving a *ne* before the tensed verb, and a *pas* after the verb—kind of like a circumfix! But in spoken French in both Quebec and France, the *ne* is almost never pronounced.

"Have-they fallen?"

What's different about French is that **main verbs** show exactly the same distribution—whereas English verbs are after negation and adverbs, and can't do Subject-Aux inversion (instead they require the support auxiliary *do*):

- French verbs show the same distribution as auxiliaries!

(27) a. Les feuilles (ne) tombaient pas.
the.PL leaves (NEG) fell NEG
"The leaves weren't falling."
b. Les feuilles tombaient toujours.
the.PL leaves fell always
"The leaves were always falling."
c. Tombaient-ils?
Fell-they(M)
"Did they fall?"

- English verbs do **not** have the same distribution as auxiliaries! (Though they did in Early Modern English, ca. 1600s)

(28) a. *The leaves fell not.
b. *The leaves fell always.
c. *Fell the leaves?

We can analyze this difference in **word order** between English and French by saying that while in English only *be* and auxiliary *have* move to T, in French **all verbs undergo V-to-T movement**.

8.5 Summary

We've now introduced two types of **movement** in our theory:

- Head movement: movement of a head to the next head position up in the tree.
- Phrasal movement: movement of a phrase to a higher specifier position.

Though we find them both in English questions (as T-to-C and WH-movement, respectively), what we see in English auxiliaries and with all French verbs is that these movement types can be found in other contexts as well—and that languages can differ in what types of movement they exhibit!

This gives us our final tool in accounting for word-order differences across languages: not just the parameters of head-initial vs. head-final ordering, but also what types of movement arise in what contexts.

Chapter 9

Fall Week 9: Thematic roles, Passives and NP Movement

Contents

Content note: "The section on Passives in Popular Discourse" embeds some examples from Twitter, one of which references a case where police officers shot someone (in Swindon, UK).

9.1 Thematic roles

In previous weeks in Syntax we've discussed verbs in terms of their **argument structure/transitivity**: the number of arguments they combine with.

In particular, we've been concerned with whether verbs take **only a subject** (intransitive), **a subject and an object** (transitive), or **a subject, an object, and an indirect object** (ditransitive).

Importantly, "subject" and "object" are **structural** terms, not semantic ones! A subject:

- Occurs in Spec-TP
- Has nominative case (if the language has nominative)
- Controls agreement on the tensed verb (if the language has subject agreement)

By contrast, an object:

- Occurs as the complement (sibling) of V
- Has accusative case (if the language has accusative)

We should ask, though: do all subjects get the same kind of **interpretation**? Do all objects?

9.1.1 The role of arguments in *events*

Looking towards semantics (the study of meaning), verbs can be thought of as describing **events** or **situations**.

The difference between events and situations, in semantics, is that **events** are often thought of as dynamic (things are actively happening), whereas **situations** are more neutral, and can include **states** (things that are simply true, without anything happening, like *being tall*). From here on I'll use "event" to refer to both.

An event is something that happens, and it involves a number of **participants**. The participants in an event can play various **roles** in the event, which in linguistics are called **thematic roles**.

Do subjects always play the same **role** in an event? It looks like they don't!

(1) The children yelled. (children did something on purpose!)

(2) The wind blew the tree down. (wind did something, but not on purpose!)

(3) The tree burned. (something happened to the tree!)

Indeed, we sometimes see this even with a single verb:

(4) a. The pirate sank the ship.
b. The ship sank.

In these two sentence, we see that the verb *sink* can be either transitive or intransitive. In the first case [the pirate] is the subject and in the second [the ship] is the subject—but they play different roles in the event! Indeed, in the first sentence [the ship] is the *object*, but plays the same role in the event as it does when it's the subject.

But for other verbs, we don't see this kind of "trading places":

(5) a. The author wrote the book.
b. The author wrote.

Here the subject stays the same in the transitive and intransitive uses of the verb *write*, and [the author] continues to play the same kind of role!

Looking back at the verb *sink*, how can we talk about the different roles that the subjects play in the two cases?

9.1.2 Some thematic roles

This is where we introduce the idea of thematic roles. Here are the thematic roles that we will use in LING 100:

Agent: Agents are animate actors who do things on purpose.

(6) [The pirate] sank the ship. (subject = agent)

Causer: Usually inanimate (not alive), cause things to happen but without acting on purpose.

(7) [The bilge pump malfunction] sank the ship. (subject = causer)

Theme: The participant affected by the event, may be *changed* by the event.

(8) a. The pirate sank [the ship]. (object = theme, affected/changed by the event)

b. The author read a book. (object = theme, not affected by the event)

Instrument: The thing an agent uses to accomplish an action. (Often, but not necessarily, in a *with* PP)

Location: The place where the event takes place. (Often, but not necessarily, in a location PP)

(9) a. The pirate sank the ship [with a cannon]. (PP = instrument)
b. The pirate sank the ship [at sea]. (PP = location)

Not all animate subjects seem to be **agents**: some animate subjects instead perceive something or experience a mental state.

Experiencer: An animate participant that experiences a mental state, including perceptions (*see*, *hear*, etc.)

(10) [Pirates] frighten **me**. (**me** = Experiencer, [pirates] = causer)

(11) a. **I** fear [pirates].
b. **I** like [pirates].
(**I** = Experiencer, [pirates] = causer)

In most **ditransitives**, the indirect object is the **goal** of the event—the location or person who receives the theme.

(12) a. The pirates sent [the ship] **a message**.
b. The pirates sent **a message** to [the ship]
([the ship] = goal; **a message** = theme)

9.1.3 Verbs determine what roles they combine with

Different verbs don't just select how **many** arguments they combine with, but also select what **thematic roles** those arguments can combine with.

But this isn't totally free! For example, if a verb combines with both an agent and a theme, **the agent is always the subject!** But other combinations of arguments are more flexible (for example, experiencer-subject transitive *and* causer-subject transitives).

But whenever a verb takes only a single argument, that argument will always be the subject!

So we have both **agent-intransitives**...

(13) a. The pirate laughed.
b. Everyone jumped.
c. The author wrote.

. . . and **theme-intransitives**!

(14) a. The tree fell.
b. The ship sank.
c. The water froze.
d. A train arrived.

Passives are a type of *derived* theme-intransitive: passive clauses end up with a theme subject by "getting rid of" the original agent subject.

9.1.4 ★Events with *no* participants

In languages like English, every (non-imperative) sentence has to have a pronounced subject.

But consider sentences like the following:

(15) a. It is raining.
b. It is snowing.

We might think that weather verbs like *rain*, *snow*, etc. take something like a theme subject—the *it* subject refers to something like "the weather".

But pronouns like *it* can usually be replaced with full NPs! That's not true of the *it* subject of weather verbs: it's quite odd to replace this *it* with [the sky] or [the weather]:

(16) a. #The sky is raining.
b. #The weather is snowing.

Thinking in terms of event **roles** gives us a way to talk about this kind of verb: these are verbs that don't have any participants! So when it's raining or snowing, then (at least in English) we don't describe that as being something that anything is *doing*.

Where does the *it* come from, then? One influential suggestion is that this *it* just shows up to give the sentence a subject, when there's no other subject available. (This is kind of like *do*-support, but for nouns!)

9.2 Passives

9.2.1 Changing argument structure

In the previous section we introduced the idea of **thematic roles** that describe the roles that participants in an event can play.

This allows us to give a somewhat deeper description of how verbs combine with arguments: verbs describe events, and verb roots don't just select a certain number of arguments, they also specify what roles those arguments play.

So far we've only looked at thematic roles that verb roots come specified with. But all languages have ways to **adjust** the thematic roles expressed in a clause, either syntactically or morphologically.

For example, many languages have a **causative** construction. Causatives add an extra causer or agent (which becomes a new subject):

(17) a. They read a book. (Transitive: Agent-Theme)
b. **I made** them read a book. (Causative: Extra agent!)

In English we have a syntactic causative. Japanese has a morphological causative—it doesn't involve an extra verb like *make*, but instead an affix on the verb:

(18) a. Neko-wa tabe-ta
cat-TOPIC eat-PAST
"The cat ate."
b. Watasi-wa neko-ni tabe-sase-ta.
I-TOP cat-DAT eat-CAUS-PAST
"I made the cat eat."

Other argument *adding* constructions include applicatives (adding a participant that the event is done *for*).

Conversely, there are constructions that **remove** an argument from the ones the verb usually projects. Perhaps the most famous of these is the **passive**, to which we turn next.

9.2.2 Passives

English, like many of the world's languages, has a passive construction, which removes the original subject of a verb, resulting in the original object becoming the passive subject. A non-passive sentence is known as an **active** sentence. For example:

(19) a. They **wrote** a book. (Original sentence: active)
b. A book **was written** (by them). (Passive)

A grammatical passive can be identified by the following three properties:

1. Original subject of the basic (active) transitive verb is demoted: it ceases to be the subject, and is **optionally** expressed in a PP: English = *by* phrase
2. Theme object of the basic (active) transitive verb becomes the **subject** of the passive.
3. Characteristic marking: English = *be* + Past Participle (*-en/-ed*)

All three of these properties are needed for a clause to be a true grammatical passive!

Consider the active sentence:

(20) The pirates sank the ship.

This is transitive, so it has a passive counterpart:

(21) The ship was sunk (by the pirates).

✔ The verb is replaced by *be* + past participle *sunk*

✔ The original subject is demoted and appears in an optional *by-phrase*

✔ The subject is [the ship], which was the theme object of the active verb.

Compare this with the theme-intransitive we saw in a previous section:

(22) The ship sank (*by the pirates).

✔ The subject is [the ship], which was the theme object of the active verb.

✗ The original subject **cannot** be expressed in a *by-phrase*

✗ There is no auxiliary *be*, and no past participle.

While the subject in both these cases is [the ship], the theme intransitive doesn't have the other properties of the passive clause!

9.2.3 Passives in Popular Discourse

In prescriptive grammar and in popular discussions, the passive gets a bad rap: advice (or "rules") for writing often says that you shouldn't use the passive voice. Sometimes this is justified by saying that the passive "hides" the agent of an event.

In fact, though, the passive allows you to express the agent in a *by*-phrase in a way that other intransitives do not!

(23) The ship was sunk by the pirates. (Passive, but expresses the agent!)

(24) The ship sank. (Active! But no way to express who did the sinking...)

(25) The bomb exploded. (Active! But doesn't say who set the bomb...)

So the reason given for avoiding the passive doesn't hold up. But it's a little bit harder for people to *process* passives, though, so it's a good idea only to use them in writing when you have a good reason to.

Online, one often sees headlines criticized for using "passive voice" for using verbs like "dies"/"died" or "something went wrong". If you search "passive voice" on a platform like Twitter, you will often find examples of this.

These tweets are typically pointing out a problem with the content of various types of public language (headlines, public statements by politicians), but they frame the criticism in terms of structure. And the sources these tweets complain about are not actually passive—they're all active! In most cases, using a passive would actually make it more possible to express an agent (e.g. "was killed by police").

Such comments are all pointing out a problem with the *content* of various types of public language (headlines, public statements by politicians), but they frame the criticism in terms of *structure*. And the sources these tweets complain about are not actually passive—they're all active! In most cases, using a passive would actually make it *more* possible to express an agent (e.g. "was killed by police").

This is an example of how *language ideologies*—our attitudes and beliefs about language—can be expressed in popular discourse. Here a legitimate criticism of public writing—not clearly expressing the agent or person responsible—is expressed using grammatical terminology (in a way that doesn't match the original grammatical meaning of the term "passive").

We could say that this is just a change in the popular meaning of "passive"—but since "avoid the passive" is also given as stylistic advice more

generally (independently of criticisms of headlines that elide responsibility), I think it's useful to try to reserve the term "passive" for the actual grammatical structure.

But to do that we need to be able to identify passives as a grammatical construction—which is part of why it's something we're talking about in this course!

9.2.4 The Syntax of Passives

So far we've talked about how to *identify* passives—but what is their syntax like? Let's start again with the active sentence:

(26) [The pirates] sank [the ship].

In a theory of syntax that employs movement, the natural way to think about the passive is to say that its syntax (e.g. the presence of the passive *be*) prevents the subject from being introduced in the first place, leaving an empty position (indicated by an underscore). The object still starts out as the sibling of the verb *sink*:

- Passive Deep Structure: [$_{TP}$ _ was sunk [the ship]]

Then because English is a language that always requires a subject, in Spec,TP, something needs to be done to fill that empty position!

This is done by **moving** the object NP into the subject position:

- Passive Surface Structure: [$_{TP}$ [the ship] was sunk the ship]

This is a new case of **phrasal movement**: movement of an NP into subject position!

NP movement: Move an NP into Spec,TP, to fill an otherwise-empty subject position.

Let's see what this looks like in a tree! 9.1 illustrates the eventual subject *the ship* starting out as the complement of the verb (the canonical theme position).

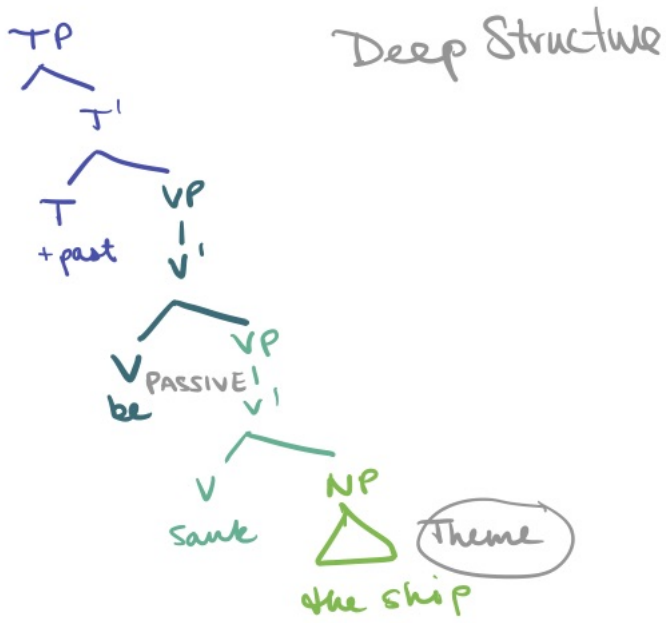


Figure 9.1: Deep structure for *The ship was sunk*.

To get the Surface Structure, we need to apply two instances of movement:

1. The passive auxiliary moves to T: **V-to-T movement**
2. The object NP [the ship] moves to the subject-position in Spec,TP: **NP-movement**

Finally, 9.3 shows the tree for the same passive clause, but with the agent expressed in an optional by-phrase, which would be an adjunct! I've drawn it as an adjunct to the passive auxiliary VP, since that's the phrase that prevents the subject from showing up in its usual place.

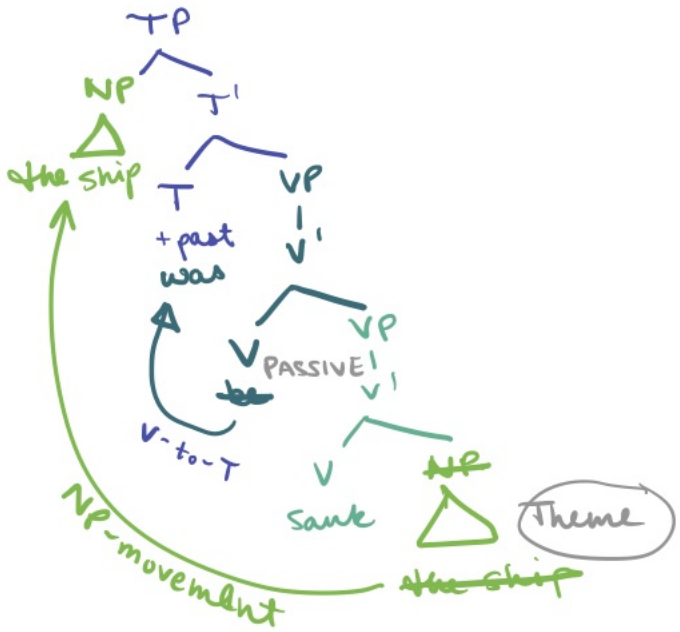


Figure 9.2: Surface structure for *The ship was sunk*.

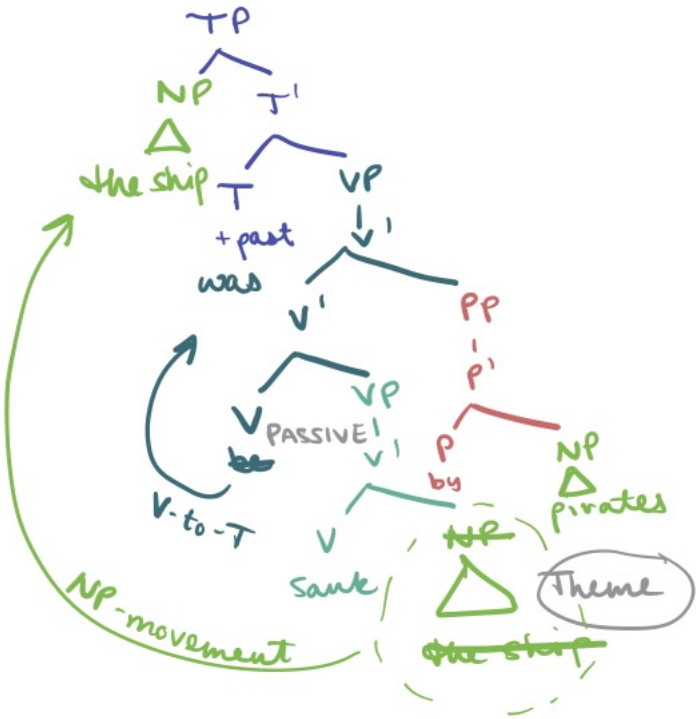


Figure 9.3: Surface structure for *The ship was sunk by pirates*.

Part IV

Semantics and Pragmatics

Chapter 10

Fall Week 10: Semantics

Contents

10.1 Introduction to Semantics

With this unit we are turning from the study of grammatical structure—in words, as in morphology, and in sentences, as in syntax—to the study of meaning.

The general term for the study of linguistic meaning is **semantics**; the study of meaning in context, or of how we *use* language, is **pragmatics**. Sometimes people equate semantics with the definitions of individual words, of the type you might find in a dictionary, but there's much more to semantics than this!

People sometimes say that an argument or disagreement is "just semantics" or "purely semantic" as a way of dismissing it—this kind of statement often annoys semanticists, who spend a lot of time carefully studying the way meaning is determined in natural language.

There are many sub-topics in semantics, but a very general division can be made between **lexical meaning** and **structural meaning**.

Lexical meaning is the meaning of individual morphemes—both individually, and in how they relate to one another. Usually in lexical semantics we are interested in the meanings of roots that belong to lexical categories: nouns, verbs, adverbs, and adjectives, and sometimes prepositions. If we ask questions like "is a hotdog a sandwich?" then we are engaged in questions of lexical semantics.

Structural meaning, by contrast, relates to compositional aspects of meaning—how the meanings of complex expressions (whether words or phrases) are determined by the meanings of their parts. If we ask how the meaning of the phrase *the red bird* is built out of the meanings of *the*, *red*, and *bird*, for example, then we are asking a question about its compositional meaning. Answering that question might be possible even without worrying too much about what *red* and *bird* "really" mean.

Consider an old aphorism: DOG BITES MAN, that's not news. Now, MAN BITES DOG, that's news.[1] Both *dog bites man* and *man bites dog* involve the same words, so there can't be any difference in their lexical meanings—but the words are combined in different ways, resulting in a difference of structural meaning.

This week we'll focus on **lexical meaning**, before turning to **structural meaning** (aka **compositional meaning**) in Week 11. First, though, let's review some general principles and terminology in the study of linguistic semantics.

10.1.1 Principle of Compositionality

The **principle of compositionality** holds that the meaning of a complex expression is totally determined by the meanings of its component parts, and how they are put together.

This principle is key to investigations of the semantics of complex expressions! Indeed, it's key to the fact that we can use and understand language **generatively**—if it weren't for the principle of compositionality, then

[1] This is a saying in journalism, that expresses the fact that common events get reported much less frequently than uncommon events, potentially resulting in public misperception of their relative frequency!

I couldn't assume that you would be able to understand sentences you've never seen before (like this one).

We'll talk about compositional semantics more next week. This week most of our focus is on general types of meaning, and the meaning of lexical items (morphemes), rather than how those meanings are built out of their parts.

10.2 Compositionality and Idioms

There's one important exception to the principle of compositionality, and that's **idioms**. Idioms are fixed expressions whose meaning *isn't* predictable from the meanings of their parts—notably, you usually can't replace a word in an idiom with a **synonym** while keeping the meaning the same.

Consider the English idiom: *(to) let the cat out of the bag*. This idiom corresponds to a verb phrase, and it means "(to) reveal a secret"—though it also has a literal meaning. Compare the idiom with a similar phrase, but with all the nouns and verbs replaced with (near) synonyms: *(to) release the feline from the sack*. This no longer has the idiomatic meaning! It now only has the literal meaning of the phrase.[2]

Some other idioms in English:

- [$_{VP}$ kick the bucket] (="die")
- [$_{VP}$ be burning the candle at both ends] (="be extremely busy/working long hours")

We can think of idioms as whole phrases that have become associated with a lexical meaning—they're phrases that have word-like meanings, rather than compositional meanings. They illustrate what language might be like without something like the principle of compositionality, precisely because they're a (relatively) uncommon *exception* to the principle.

Idioms are relatively challenging to learn in a second language—something some of you might be personally familiar with! If you speak a language other than English fluently, try thinking of some idioms in that language—if you only fluently speak English, think of some more idioms in English—and see if the idiomatic meaning is kept if you replace one or more words with a synonym. Idioms often have an open "slot", where you can swap in a

[2]People do sometimes say things like "the feline was released from the sack" in a context where it's clear they mean to convey the idiomatic meaning of something like "the cat was let out of the bag", but almost always as a joke or a form of word play.

different subject or object, or make the sentence as a whole a question, etc. Is that true of the idiom you thought of?

10.2.1 Extensional vs. Intensional meaning

When we think about the "meaning" of a linguistic expression—whether that's a word, a phrase, or even a whole sentence—there are a few different *types* of meaning that we might consider.

One important distinction is between the **extension** of a word's meaning—sometimes also called its **denotation** or its **reference**—and its **intension**—sometimes also called its **sense**.

Extension The set of things in the actual world that a word /phrase describes.

Intension The instructions for identifying things that a word describes.

This is a slightly tricky distinction, and it's probably easier to think about with an example. Consider the NP [$_{\text{NP}}$ the tallest building in the world]. At any one time, there is only one building that is *actually* the tallest building in the world!

Right now, in 2020, that building is the Burj Khalifa in Dubai[3]. The phrase [the tallest building in the world] picks out that building—in one sense, that is the *meaning* of the phrase. This is the **extensional meaning** of the phrase.

But at other points in history, other buildings have been the tallest buildings in the world! Depending on what we mean by "building", there have been many tallest buildings in human history[4]. For example, for most of the 20th century the Empire State Building[5] was the tallest building in the world. In that sense, the **extension** of [the tallest building in the world]—the actual thing it picks out or refers to—has changed over time.

In another sense, though, the meaning of this phrase hasn't changed at all. This is the other kind of meaning, the **intension** or **sense** of the phrase.

Unlike the reference of the phrase, which I can illustrate with a link or a picture, it's much harder to characterize what the intension of a phrase (or word) "really" is. We might try to characterize intensions in terms of definitions, or a list of necessary and sufficient conditions for applying a

[3] https://en.wikipedia.org/wiki/Burj_Khalifa
[4] https://en.wikipedia.org/wiki/List_of_tallest_freestanding_structures
[5] https://en.wikipedia.org/wiki/Empire_State_Building

word, but there are good reasons to think that that's not the best way to model how word meanings are represented in the mind.

10.2.2 Meanings as Concepts

Depending on the types of conversations you enjoy having with friends, you might find it either enjoyable or *incredibly frustrating* to debate with friends the answers to questions like:

- Is a hotdog a sandwich?
- Does your thumb count as a finger?
- How many holes are there in a straw?

The hotdog-sandwich debate was a recurring topic on the podcast *Judge John Hodgeman*, and ultimately they "decided" the question by bringing on a guest, Emily Brewster, from the Merriam-Webster Dictionary. The relevant episode reviewed arguments made in a post on the Merriam-Webster blog, which concluded (based on applying the details of the dictionary definition) that a hotdog IS a sandwich[6].

Setting aside the fact that dictionaries aren't the ultimate arbiters of what words "should" mean, there's another problem with this argument, which is that the actual meaning of words isn't well described by just applying a list of necessary and sufficient conditions!

Instead, there are good reasons to think that our meanings for words are better described as **concepts** or **prototypes**. A **prototype** in this sense is a kind of core or clearest example of something, which serves as a model for evaluating other cases. (This is related, but not exactly the same as, the use of "prototype" to describe a trial first version of a new invention or product.)

To see how this applies to word meanings, think of an example of something that you could describe as a **bird**.

If you do an image search for "bird", for example on Google, probably the majority of the early results will be approximately the same size and shape as whatever you imagined. These would be **prototypical** birds.

But as you scroll down you'll see examples that are less closely related to that core concept: for example, owls and cranes and pelicans and ostriches and even cassowaries[7]. These are definitely still *birds*, but they're somehow

[6] https://www.merriam-webster.com/words-at-play/to-chew-on-10-kinds-of-sandwiches

[7] https://en.wikipedia.org/wiki/Cassowary

less good *examples* of birds than smaller or more regularly bird-shaped birds. We can say that they're further out from the **core** of our concept of what counts as a bird.

This is a kind of **fuzzy category**: the core cases are very clear, but at the boundaries things get less certain. Another good example to think about in this respect are **colour terms**: while colour vocabulary varies a lot across languages, it's also the case that even within a language people can confidently identify core colours like blue or red, but might be less certain (or might disagree) about whether a particular colour chip would be better called "blue" or "purple", or whether another one is more "red" or more "pink".

There's good psychological and psycholinguistic evidence that we represent word meanings in terms of prototypes and concepts with fuzzy boundaries, as discussed in the textbook.

10.2.3 Denotation vs. Connotation

Another important distinction in meaning is between **denotation** and **connotation**.

The denotation of a word is often identified with its extension, but we can say more generally that its denotation is its **literal meaning**. The connotation of a word, by contrast, is its **evaluative** meaning—whether it has positive or negative associations, for example.

We can see this distinction more clearly by looking at words that have the same **denotation**, but that differ in their **connotation**.

For example, consider the words *clever*, *cunning*, and *sly*. These all have approximately the same literal meaning: if someone is clever, cunning, or sly, then they have a particular kind of intelligence that allows them to figure out plans or puzzles. But while *clever* is a positive word, both *cunning* and *sly* have negative connotations for many speakers of contemporary English: they imply that someone is not just clever, but likely to use that cleverness to trick or deceive other people.

Words can also have connotations that involve associations with *social prestige*. For example, for many English speakers words that are derived from French and Latin are associated with intelligence and education—this is part of their **connotation**. One consequence of this connotation is that students often over-use such words in their writing (this is something to look out for when you're writing essays and term papers!).

10.3 ★Relationships between word meanings

In the previous section I referred to **synonyms** that a word might have, but didn't define this term. In this section I briefly define this and other terms for relationships between lexical meanings, since these give us useful vocabulary to talk about meanings.

synonym Two words are **synonyms** (*adj.* synonymous) if they have the same denotation /extension.

- Example: **red** and **crimson** are synonyms.

We might ask whether any two words are ever *really* synonyms—do two words ever really have *exactly* the same meaning? For example, if you look up words in a thesaurus, you'll find lots of words listed as synonyms that don't *quite* mean exactly the same thing. We might sometimes hedge this and talk about "near synonyms" or "close synonyms"

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antonym Two words are **antonyms** if they have opposite meanings, or if their extensions pick out complement sets (anything that is not in the extension of one *is* in the extension of the other).

- Example: **up** and **down** are clear antonyms.

homophone /homonym Two words that **sound** the same, but have different meanings. *Note:* "homophone" technically refers to words that sound the same, regardless of spelling, while "homonym" is sometimes used to refer either to words that sound the same or that are spelled the same. In linguistics we're more interested in words that sound the same, regardless of how they're spelled.

- Example: **intension** (the type of meaning) and **intention** (i.e. to intend to do something) are **homophones**, even though they're spelled slightly differently.

- **complement** (the sibling of a head), and **compliment** (something nice someone says about you) are also homophones.

homograph Two words that are **spelled** the same.

- Example: the present and past tense of the verb *(to) read* are homographs in English, but not homophones—they look the same but sound different.

hypernym /hyponym We can sometimes organize words into **categories**. For example: we can have a top category **food**, under which we find **fruit** and **vegetable**, and under **fruit** we might in turn find **banana**, **apple**, **kiwi**, etc.

A **hypernym** is a more general term. So *fruit* is a hypernym for *banana*.

A **hyponym** is a word for a lower-level object inside a category. So *banana* is a hyponym for *fruit*

You definitely do not need to memorize all of these terms! But it's good to remember that you've seen them before, so that you can more easily look them up if you encounter them in the future.

10.4 Lexical domains

In addition to the terminology about word meanings in the section above, we also find that languages sometimes have parts of their lexicon—their list of words and morphemes—that are **structured** in other ways.

Consider, for example, how gender is expressed in English vocabulary. Unlike some languages, English doesn't have **grammatical gender**—in other words, nouns in English aren't arbitrarily assigned to categories like "masculine" and "feminine", and neither adjectives nor verbs show morphology that matches the gender of nouns in a sentence.

But there are many pairs of words in English that are distinguished only by the gender or sex of the animate thing they refer to.

Grammatical gender is a property of words in a language, not of things in the world. When applied to people, gender is a social or conceptual category. Since animals don't have a gender identity, I'll use "sex" to refer to their biological characteristics.

Consider the following words referring to animals: each word is followed by ♂ if it refers only to male animals, by ♀ if it refers only to female animals, and by ⚥ if it refers to animals of either sex.

- cow (⚥) : bull (♂)
- vixen (♀) : fox (⚥)
- goose (⚥) : gander (♂)

In many other cases we have a general term for a species of animal alongside specific terms for female and male animals of that species:

- deer (⚥) : doe (♀) : buck (♂)
- pig (⚥) : sow (♀) : boar (♂)
- chicken (⚥) : hen (♀) : rooster/cock (♂)
- sheep (⚥) : ewe (♀) : ram (♂)
- horse (⚥) : mare (♀) : stallion (♂)

We also have specific terms for juvenile animals of many species:

- cow : calf
- deer : fawn
- pig : piglet
- cat : kitten
- dog : puppy

- sheep : lamb
- horse : colt
- goose : gosling

Like inflectional information, these sets of terms can be organized into tables. For a very long list of animal terminology in English, you can look at the Wikipedia article List of Animal Names[8]. But even though that table is very long, it has two notable features that are quite different from a table showing truly grammatical information (inflection) in a language:

1. Many terms repeat! Lots of animals are referred to using sow/boar, cow/bull, and hen/cock, for example.
2. Many cells in the table just have '?', because there's no specific word for (among other things) a male or female marmoset. By contrast, if a language has inflection for grammatical gender, every noun must have an associated gender.

The point we're making here is that we can look at **networks** of meaning in certain domains of a language as a type of relatedness between word meanings.

The areas where a language has particularly dense networks of meaning are often areas that are relevant for many people in their day-to-day lives. A lot of the animals for which we have very detailed vocabulary are ones that have been domesticated, for example—and English speakers who haven't lived on a farm, or had much reason to talk about domesticated farm animals, might not know all the words listed above! Studying how word meanings are structured can therefore be a way of looking at how our concepts are structured, or at least what types of things we have frequent reason to talk about.

10.4.1 Kinship systems

One area of vocabulary that's highly structured in many languages is the system of **kinship terminology**, the set of vocabulary used to refer to family members and relatives.

In English, for example, we have **monomorphemic** words (words with only one morpheme) that refer specifically to male and female relatives, alongside non-gender-specific terms, for the following relationships:

[8] https://en.wikipedia.org/wiki/List_of_animal_names

- parent (⚧): mother (♀) : father (♂)
- child (⚧) : daughter (♀) : son (♂)
- sibling (⚧) : sister (♀) : brother (♂)

But if we want to refer to our *cousin* in English, there is no gender-specific term! And for other family relationships, English has historically had *only* gender-specific terms: the child of your sibling can be your *niece* or your *nephew*, but people have only recently coined the non-gender-specific terms *nibling* or *niefling*. We've long had the words *aunt* and *uncle* in English, but if your parent has a nonbinary sibling you have several recently-coined terms to choose from (*auncle*, *ommer*, and *untle* are three I've seen).

English has a comparatively impoverished set of kinship terms, when we look across the world's languages. There are many distinctions that we don't make in English—and that also weren't made in earlier stages of English—that are part of the everyday vocabulary in other languages.

For example, in English we don't have different terms for older vs. younger siblings, whereas in many languages there's *no* general term for "brother", "sister", or "sibling", but only specific terms depending on your relative ages.

In Japanese, for example, the terms are as follows (in comparatively formal speech):

- ane "older sister"
- imouto "younger sister"
- ani "older brother"
- otouto "younger brother"

In Kanien'kéha, the terms are as follows:[9]

- akhtsí:'a "my older sister"
- khe'kén:'a "my younger sister"
- rakhtsí:'a "my older brother"

[9]Note the further detail that in Kanien'kéha it's not possible to just say "younger sister", you have to specify whether the sister is my sister, your sister, or someone else's sister! This is because family member terms in this language are **inalienably possessed**, meaning that they require you to always express the person whose relative you're talking about.

- ri'ken:'a "my younger brother"

(Source: kanienkeha.net[10])

In Anishinaabemowin, like in Mohawk, words for family members have to have "possessor" marking—you have to say whose family member they are—and there's a slight further complication that there are separate terms for older brother vs. older sister, but only one word for younger sibling:

- nimisenh "my older sister"
- nisayenh "my older brother"
- nishiime "my younger sibling /my parallel cousin"

(Source: Ojibwe People's Dictionary[11])

The word *nishiime* shows something else interesting: this word can refer either to a younger sibling or to a "parallel" cousin. In some languages terms for family members vary according to whether you trace through people of the same gender or different genders.

So your parallel cousins are your mother's sisters' children and your father's brothers' children—similarly, your parallel aunts are your mother's sisters, and your parallel uncles are your father's brothers. By contrast, your cross-cousins and uncles and aunts are related through your mother's brothers and your father's sisters.

This type of system is complicated if you're used to a system like the one in English, but it's perfectly straightforward if you speak a language where these are just the terms used to refer to family members!

10.5 Deixis

This general topic is well covered in the textbook! I note only the alternative term **indexical** for words whose context is determined by context.

Languages can have deictic elements / indexicals that refer to person (speaker / hearer), location, and time. For example:

(1) I am here now

[10] https://kanienkeha.net/
[11] https://ojibwe.lib.umn.edu/

10.5.1 Demonstratives

In many languages, we have **structured** meaning again in the domain of demonstratives!

English demonstratives make a two-way distinction between objects that are close to the speaker, and those that are further away.

- *this* (close to the speaker)
- *that* (far from the speaker)

(These are the singular forms—*these* and *those* are the corresponding plural demonstratives)

In French, by contrast, there's no such distinction! The demonstrative *ce* (masculine) /*cette* (feminine) can translate either *this* or *that* depending on context—even though French does have the near/far distinction elsewhere in its deictic vocabulary, with *ici* meaning "here" and *lá* meaning "there".

The most common pattern, across the world's languages, is to have a two-way distinction like the one in English. But the second most common pattern is to have more distinctions, usually three!

To use Japanese as an example again, there is a three-way distinction:

- kore (close to the speaker)
- sore (close to the hearer /at a middle distance)
- are (far away)

The same distinction can be found in Anishinaabemowin. (The examples given here show the inanimate singular demonstratives in Anishinaabemowin—there are other demonstratives for inanimate plurals, and animate singular and plural.)

- o'ow (close to the speaker)
- i'iw (at a middle distance)
- iwidi (far away)

The sets of distinctions encoded in demonstratives are an interesting middle point between the type of structured meaning that we see in (for example) gender-specific nouns in English, and the type of structured meaning that we see in inflectional morphology. We wouldn't say that "distance"

is inflectional information in English, for example—it's never involved in syntactic relationships, and we don't mark it morphologically on nouns—but it's nonetheless more regularly and systematically structured than our gender vocabulary is!

Chapter 11

Fall Week 11: Compositional Formal Semantics

Contents

11.1 More on denotation

11.1.1 Denotations and sets

So far we've talked mostly about two kinds of denotation, or reference.

One is the type of denotation that **proper names** have—expressions like *Empire State building* or *Great Pyramid of Giza* or *Serena Williams*.

We've said that the denotation of these words is a single object or person in the world—the name *Serena Williams* points to a particular individual in the world, a famous tennis player.

Definite noun phrases with *the* do the same thing! The definite NP *the tallest building in the world* points to a unique thing in the world in much the

same way that *Empire State Building* does (though the thing it points to can change as things in the world change).

The other type of denotation we've talked about is the denotation of nouns like *cat* or *book* or *apple*. Unlike names and definite NPs, these don't point to a *single* thing in the world. Instead they point to a **set** of things. So the denotation of *book* is the set of all the actual books in the world.

11.1.2 Set notation *or* how to describe a set

When we talk about sets, we can do so either in words or using set notation. Using words can be easier if you're not used to set notation (which you might have encountered in mathematics), but it's even in writing it's important to be precise.

At its core, set notation is very simple: we put curly braces—{ and }—around a list of the items in a set, with the items separated by commas.

Let's say we wanted to describe a set containing the following individuals:

- 👩‍🦰 Mel
- 👨‍🌾 Kent
- 🧑‍🦳 Ellis
- 👩🏿‍🔬 Aliya

(This is a pretty arbitrary set! There isn't a *single* noun that this set would be the denotation of, but it might be the reference of a complex NP like [*imaginary characters identified with emoji in the LING 100 Week 11 Topic Guide*])

We could describe this set in a few different ways. For example, we could describe it in words:

- The set containing Mel, Kent, Ellis, and Aliya

We could also use set notation in a few different ways. First, we could use names to identify each person:

- {Mel, Kent, Ellis, Aliya}

Alternatively, we could use images to represent each person (which works well here because they were all introduced with emoji in the first place), or give each person a simple label:

- {👩🏾‍🎤, 👨🏼‍🏫 , 👨🏻‍🍳, 👩🏿‍🔬}
- $\{m, k, e, a\}$, where each letter is the first initial of the person's name.

If you use labels like in the last example, it's important to be absolutely sure that it's obvious who each label would point to. It's good practice to always define any variables or abbreviations, even if you think they're obvious.

I could also describe this set more abstractly, using a variable x:

- The set of all individuals x where x is one of the imaginary characters identified with emoji in the LING 100 Week 11 topic guide.
- { x | x is an imaginary emoji character from the LING 100 Week 11 topic guide }

For our purposes in this course—and in particular for Assignment 4—all of these options are equally acceptable.

11.1.3 Composing individuals and sets

So if the proper noun (name) *the Empire State Building* denotes a specific building, and the noun *skyscraper* denotes the set of all the skyscrapers in the world {🌃,🌃,🌃,🌃,. . . }, how do these denotations compose—in other words, how do they get put together in a sentence like the following?

(1) The Empire State Building is a skyscraper.

What this sentence seems to say is that the building that *the Empire State Building* points to is **in** the set of skyscrapers.

Can we just ignore the verb *to be* and indefinite *a*?

In discussing how the subject and predicate compose in *The Empire State Building is a skyscraper*, I ignored the present tense verb *is*, and the indefinite article *a*.

This is because the verb *be* and the determiner *a* don't seem to contribute anything to the interpretation of this sentence—they're there for syntactic reasons, not semantic ones.

Indeed, many languages don't use a verb like *be* at all, even with nominal or adjectival predicates—at least in the present tense! This is true of Russian, Japanese, and American Sign Language, among many other languages.

In addition to nouns, there are other types of words whose denotation we can model as pointing to **sets** of things in the world. We've already talked about **adjectives** as denoting sets in this way:

- *blue* denotes the set of all the things in the world that are blue.
- *wooden* denotes the set of all the things in the world that are wooden.
- *sticky* denotes the set of all the things in the world that are sticky.

Adjectives whose meaning can be described as sets in this way are known as **intersective** adjectives; in the next section we'll talk about some other types of adjectives.

How do adjectives compose with nouns? Consider a sentence like the following:

- Serena Williams is an American athlete.

The adjective *American* denotes a set:

- The set of all individuals who are American ← *in words*

- { x | x is American } ← *in set notation*

The common noun *athlete* also denotes a set:

- The set of all athletes
- { x | x is an athlete }

What does the NP [*American athlete*] denote? It denotes the set of everyone who is *both* American *and* an athlete—this is the overlap of the two sets, formally called their **intersection**.

The final category that denotes sets of individuals is **intransitive verbs**. The denotation of a verb like *jump* or *smile* or *sleep* will be the set of all the people who jump or smile or sleep.

What about tense? Probably it's more accurate to say that *jump* or *smile* or *sleep* denote sets that are relative to particular *times*, with the relevant time being provided by tense. The semantics of tense is an important part of natural language semantics!

However, incorporating tense into our semantics would require us to think not just about individuals but also about events and times, so for our purposes in LING 100 we'll stick to sentences in the simple present tense and ignore the question of how T /tense features should be interpreted.

Some predicates don't pick out anything in the actual world, because they describe impossible or fictional objects!

In some cases this is because they involve a logically incoherent combination of words: the NP [*a seven-sided sphere*] doesn't pick out anything in the world, because it's impossible for something to be both seven-sided and a sphere.

We might think that mythical or fictional creatures also don't pick out anything in the actual world. So an NP like [*unicorn*] or [*mermaid*] doesn't pick out anything in the actual world—though unlike logically incoherent NPs, these names do have *intensional meaning*, and they pick out individuals in other possible worlds we can imagine (or possibly things in this world, if the set of individuals includes fictional individuals—but that's a question for a more advanced class in Semantics!).

We say that predicates like these, that don't pick out any actual objects, all denote the **empty set**—this is a unique set, a set with no members. In set notation we can refer to the empty set with a pair of empty curly braces—{}—or with the **empty set symbol** $\varnothing$, which is the same symbol we use in linguistics to represent things that have no pronounced content.

11.2 Non-intersective adjectives

Not all adjectives can be described in terms of set intersection.

Consider, for example, the NP [*fake diamond*]. This doesn't denote the intersection of the set of fake things and the set of diamonds—part of the meaning of [*fake*] is that a fake diamond isn't in the set of diamonds!

These are called *non-intersective adjectives*. We won't discuss them further in this course, but they show that there's still more complexity to the types of denotations that adjectives can have than we might have thought.

11.3 The Denotations of Transitive Verbs

If the denotation of an intransitive verb—a verb that combines with one noun phrase—is a set of individuals, what would the denotation of a transitive verb like *see* or *like* or *high-five* be?

Consider the following example:

(2) Venus high-fives Serena.

What does it seem like the verb *high-five* is doing in this sentence?

Unlike an intransitive verb—or an adjectival or nominal predicate—this verb doesn't describe a single individual, but instead relates two individuals to each other. It also relates them in a particular *order*—this isn't so obvious with a verb like *high-five*, but you can see it with a more asymmetric verb like *see* or *congratulate*, where one individual is clearly the agent and the other is the theme.

Figure 11.1: Serena Williams and Venus Williams high fiving (Image Credit: Getty Images)

(3) Venus congratulates Serena.

A transitive verb thus doesn't denote a set of individuals, but a **set of pairs of individuals**—and each of those pairs comes in a particular order.

- high-five = a set of ordered pairs of individuals <x,y>, where x high-fives y. (Includes the pair <Venus Williams, Serena Williams>)

Notice that in this example I put the agent of each pair first, and the theme second. In the Content Video I did it the other way around—both options are fine, as long as you're consistent!

11.4 The Denotation of Statements

So far we've talked about the denotation of arguments (NPs) and predicates (NPs, AdjPs, and VPs). What about the denotation of whole sentences?

Consider the following sentence:

(4) This cactus is prickly.

The definite NP [*this cactus*] denotes the following small cactus that happens to be in my house:

The adjective [*prickly*] denotes the set of objects in the world that are prickly—a set that includes many cactuses, many hedgehogs, many porcupines, all the burrs, all the sea urchins, all the plants with thorns, etc. There are a lot of things in this set!

To interpret this sentence, we check to see if this particular cactus is in the set of prickly things. There are two possible results:

Figure 11.2: A small cactus in a white pot.

- The cactus **is** in the set—the sentence is **true**.
- The cactus is **not** in the set—the sentence is **false**.

This describes the **truth conditions** for the sentence [*This cactus is prickly*]. But what is its actual denotation?

In semantics we say that the **denotation** of a sentence—or rather, of a statement—is its **truth value**. That is, a statement either denotes **True**, or it denotes **False**. This means that all true sentences have the same denotation, as do all false sentences!

Just as we aren't usually concerned with figuring out the complete list of all the exact objects in the world are in the set of prickly things, though, in semantics we aren't usually concerned with looking at the world to figure out the actual truth value of a sentence. We are more often concerned with its truth conditions—which are basically instructions for what the world would have to be like for the sentence to be either true or false.

11.5 Semantic types

When talking about denotations, we've introduced the following potential denotations for different types of words and phrases:

- individuals (names and other definite NPs)

- sets of individuals (adjectives, intransitive verbs, common nouns)
- sets of pairs of individuals (transitive verbs)
- truth values (statements)

Each of these is a different **semantic type**. In semantics it's frequently useful to talk about how these types interact with one another, and to do that we use abbreviations for the types.

Expressions that denote individuals are of type **e**. (Imagine that this stands for "entity".)

Expressions that denote truth values (that is, statements) are of type **t**.

What about denotations that involve sets of various kinds?

To talk about sets in terms of semantic type, we first have to talk about sets as **functions**. A function—in semantics, as well as in math and programming—is anything that takes an input and gives you a specific output.

Consider the following sentence again:

(5) This cactus is prickly.

When we check to see if the individual [*this cactus*] is in the set of prickly things, we are essentially performing a function:

- If the cactus **is** in the set, we get the value 'true' (often abbreviated T or 1)
- If the cactus is **not** in the set, we get the value 'false' (abbreviated F or 0)

What does this function do, in terms of its **semantic type**. Well, it takes an individual, and spits out a truth value. In other words, it pairs up individuals and truth values—a kind of ordered pair.

Expressions that denote sets of individuals are therefore of type <**e,t**>.

What about transitive verbs, which denote sets of pairs of individuals? Like the following:

(6) Venus high-fives Serena.

I encourage you to stop here and see if you can figure this out on your own. We'll talk about this in Tuesday's class, and it's also (going to be) in this week's Practice Problems.

One way of thinking about these is that instead of mapping single individuals onto truth values, they map pairs onto truth values. We might think of this as being type <<e,e>t> (but read on to see why that's not quite right).

But while that matches the denotation we gave for transitive verbs, it doesn't match our syntax! We want the function a verb represents—the way it combines with its inputs—to reflect the way it combines with things in a structure. This is part of the principle of compositionality.

How does a transitive verb combine with its arguments? Well, first it combines with its object to form a VP (in the example above, [$_{VP}$ high-fives Serena]), and then the whole VP combines with the subject.

In terms of a function, we can think about the first step this way:

- [$_{V}$ high-fives] = the set of pairs of individuals <*x*,*y*>, where *x* high-fives *y*.
- [$_{VP}$ high-fives Serena] = the set of pairs of individuals <*x*, Serena Williams>, where *x* high-fives Serena Williams
    - **AKA** the set of individuals *x* who high-five Serena Williams.

So far the verb has mapped an individual onto a set of individuals—the denotation of the whole VP is just like the denotation of an intransitive VP, or of any other type of predicate.

So expressions that denote transitive verbs are of type <**e**,<**e**,**t**>>—they take an individual, and give you a function from individuals to truth values.

Chapter 12

Fall Week 12: Pragmatics and the Cooperative Principle

Contents

A version of this chapter appears as chapter 10.5 in the version of *Essentials of Linguistics* available at https://ecampusontario.pressbooks.pub/essentialsoflinguistics/chapter/10-5-pragmatics-and-the-cooperative-principle/.

12.1 Pragmatics

In talking about the meaning of phrases and sentences, so far we've focused on the literal meaning of words and morphemes—their **denotations**—and how those literal meanings **compose** with one another in predictable ways. The study of these types of meaning is the domain of semantics.

But there are other aspects of meaning that can't be studied or understood in these terms, things we communicate not with the literal meanings of our words and how they're arranged, but instead by the *way* we choose to

say them, or the *social context* of our communication. These types of meanings are the domain of **pragmatics**, the study of meaning in its social or communicative context.

Put another way, probably all of us have the experience of having our words misinterpreted, or taken "out of context". This often happens even if someone definitely understood our literal words—they may simply have misread our intentions or goals. This type of misunderstanding is precisely the kind of thing we might investigate in pragmatics—both what we *intend* to communicate, and how someone else might *interpret* our communications.

In this unit we focus on one particular type of pragmatic reasoning, the the calculation of **conversational implicatures** on the basis of what are known as **Gricean Maxims**—these maxims were proposed by the philosopher H.P. Grice in a (1975) paper that proposed that in conversation we adopt a **Cooperative Principle** when interpreting what people say (Grice, 1975).

12.2 Terminology: Entailment, Presupposition, and Implicature

Before discussing the Cooperative Principle and the individual maxims, let's introduce some terminology that will help us talk about the logical relationships between sentences—the different ways in which we can draw conclusions.

Consider the following pair of sentences:

(1) Jennice and Alice have both read *War and Peace*.

(2) Jennice has read *War and Peace*.

If the first of these sentences is true, the second one also has to be true! Put another way, if the second sentence is false, then the first sentence is also definitely false. This is the relationship of **entailment**.

Entailment For two propositions (i.e. things that can be true or false) P and Q, P entails Q if whenever P is true, Q must also be true.

Entailment is technically a semantic relationship rather than a pragmatic one, but it's useful to have it in mind to contrast two other relationships with: **presupposition** and **implicature**.

Consider next the following two sentences:

(3) Nadim's brother is visiting.

(4) Nadim has a brother.

This might seem to be another case of entailment, but it works a little bit differently. If the first sentence is true, the second one also has to be true. But if the second one is false—if Nadim doesn't have a brother—then it's not just that the first sentence is false, it seems like we can't even really interpret the first sentence. Here we say that the first sentence **presupposes** the second one.

Here's another pair of sentences where the first sentence **presupposes** the second one:

(5) Lou stopped smoking.

(6) Lou used to smoke.

If someone asks you *Have you stopped smoking in the last year?* and you never smoked, you couldn't answer "yes" or "no"—instead you might say "Hey, wait a minute! I never smoked!" This temptation to say something like *Hey wait a minute!* is a sign of a presupposition that isn't satisfied.

Presupposition For two propositions P and Q, P presupposes Q if Q has to be true for P's truth or falsity to be evaluated.

Finally this brings us to **implicature**, which is the relationship most relevant for our discussion of Gricean maxims.

Consider a final pair of sentences:

(7) Marie has two cats.

(8) Marie has exactly two cats.

If someone said to you "*I have two pet cats.*", in most contexts you would assume that they didn't have 10 cats—if it turned out that they did have 10 cats, you'd feel that they'd misled you somehow. But there's nothing about the first sentence in the pair above that logically *entails* that Marie doesn't have more than two cats.

Grice (1975) introduced the term **implicature** for the relationship between the first and second sentences in this pair.

Implicature For two propositions P and Q, P **implicates** Q if a listener would infer Q on the basis of someone saying P, despite P not entailing or presupposing Q.

Implicatures, unlike presuppositions or entailments, are **cancellable**—that is, you can negate them without contradicting yourself or saying something infelicitous.

(9) Marie has two cats—in fact she has ten cats. (implicature → cancellable)

(10) #Lou stopped smoking—in fact they didn't used to smoke. (presupposition → not cancellable)

(11) #Nadim's brother is visiting—in fact Nadim doesn't have a brother. (presupposition → not cancellable)

(12) #Jennice and Alice have both read *War and Peace*—in fact Jennice hasn't read *War and Peace*. (entailment → not cancellable)

Grice distinguished two types of implicatures:

- Conventional implicatures: triggered by specific words
- Conversational implicatures: calculated based on the Cooperative Principle /specific maxims

We will be mostly concerned with **conversational implicatures**. Just for illustration, though, an example of a word that triggers a conventional implicature in English is the coordinator *but*. Consider the contrast between the following two sentences:

(13) Ruowen likes chocolate ice cream and Helen likes vanilla ice cream.

(14) Ruowen likes chocolate ice cream but Helen likes vanilla ice cream.

Logically speaking, both *and* and *but* mean the same thing—both of these sentences are true only if it's true that Ruowen likes chocolate ice cream AND true that Helen likes vanilla ice cream.

Grice observed that the coordinator *but* **implies** that there's a contrast between the two clauses, though, or that it's somehow surprising to assert the second one. This is the conventional implicature of using *but* instead of *and*.

12.3 Gricean Maxims and the Cooperative Principle

What are we trying to do when we have a conversation with someone? There probably isn't any one thing that we're *always* trying to do, but often part of what we're trying to do is exchange information.

Some of the things we communicate are not part of the logical or literal meaning of our words. For example, consider the following exchange (adapted from Grice 1975):

(15) A: How does your friend like working at the bank?
B: Oh, pretty well. They like their colleagues, and they haven't been sent to prison yet.

What does B mean by saying their friend hasn't been sent to prison yet? They could mean a number of things: maybe B is given to telling jokes, or maybe they mean that their friend isn't usually trustworthy, or maybe they mean that if you didn't like working at a bank you'd steal money.

The actual meaning conveyed will depend on the context: what A and B both know, their relationship to one another and to B's friend, and other factors. Whatever B means, though, it's clear that by saying "they haven't been sent to prison yet", B is conveying something more than just the literal meaning of their words! Many many people haven't been to prison! Why is B bringing it up?

The meaning conveyed by a utterance based on these kinds of considerations is its **conversational implicature**: implicatures that arise from the structure of discourse or conversation, based on our understanding of how communication works.

Conversational implicatures arise in the context of a general **Cooperative Principle** for communication. The idea of this principle is that we assume, when we speak to people, that we are working towards a common goal (or common goals), and we can interpret what people say in light of that. So in the mini dialogue above, A can assume that there was some reason that B mentioned that their friend hadn't been sent to prison yet—they didn't simply add a true but irrelevant statement to the conversation for no reason!

Under the general heading of the Cooperative Principle, there are four more specific **maxims** that Grice proposed:

1. Maxim of Quantity
2. Maxim of Quality
3. Maxim of Relation
4. Maxim of Manner

In the following sections we will review how each of these maxims works when it is successful, before turning to two ways in which someone can fail

to follow the maxims in conversation: either by **violating** a maxim or by **flouting** one.

If we **violate** a maxim, then we simply fail to follow it. At best, violating a maxim results in being a confusing or uncooperative conversationalist. At worst, violating a maxim involves lying or being intentionally misleading.

If we **flout** a maxim, by contrast, we **blatantly** fail to follow it—we aim to communicate something precisely by making it very obvious that we have chosen not to follow the cooperative principle, and trusting that our audience will draw the intended conclusions.

12.3.1 Maxim of Quantity

The maxim of **quantity** states:

- Make your contribution as informative as is required.
- Do not make your contribution more informative than is required.

To follow this maxim, we make the strongest claim that's both compatible with the facts and relevant in context.

For example, consider the following conversation:

(16) A: Does Elspeth have any siblings?
B: Yes, she has a sister.

When hearing B's response, A assumes that B is *fully* answering the question—that is, that B is being as informative as possible. So A would naturally assume that Elspeth has *exactly* one sister, and doesn't have any brothers.

If it turned out that Elspeth has two sisters and a brother, A would feel that B had misled them—this would be an example of **violating** the maxim of quantity.

Changing the context can change how we calculate this implicature, though. Suppose that A needs to borrow a car in order to run an errand, and the following conversation ensues:

(17) A: Does Elspeth have a car I could borrow?
B: Yes, she has a car.

In this context A will conclude that Elspeth has *at least* one car. Even if it turns out that Elspeth has two cars, A won't feel like B misled them—because the second sub-maxim above says that you shouldn't be more infor-

mative than a conversation requires, and in the relevant context all A needs to know is whether there's a car they can borrow.

Flouting the maxim of quantity can be done in a few different ways! Grice gives the example of a reference letter for a job as a Philosophy professor that says, in its entirety:

- "Dear Sir,[1] Mr. X's command of English is excellent, and his attendance at tutorials has been regular. Yours, etc." (p. 52)

This letter is ostentatiously much shorter than a reference letter would usually be, and so gives rise to the implicature that there is nothing else that the writer can say about Mr. X that would be positive.

A possibly more subtle example of flouting the maxim of quantity might be something like the following:

(18) Student:When is Assignment 2 due?
Professor:You can find that information in the syllabus, which is posted on the course website.

In this exchange, the professor hasn't actually provided an answer to the student's question—in that sense it is an uncooperative response. The professor intends to communicate that the student should be able to answer their own question on the basis of information available to them. (The professor's response probably also involves flouting the maxim of relevance, since they have not directly answered the question asked.)

12.3.2 Maxim of Quality

The maxim of **quality** states:

- Do not say what you believe to be false.
- Do not say that for which you lack adequate evidence.

In some ways the first of these points is the most basic maxim for the Cooperative Principle: communicating in good faith seems to require that we are—or at least try to be—truthful.

[1] This is a now–outdated greeting for a formal business letter when you don't know the name of the person who will receive the letter. It would now be rude to assume that the recipient would be a man.

The second point—don't say that for which you lack adequate evidence—is a bit harder to judge, and what counts as "adequate evidence" varies a great deal from context to context.

Violating the maxim of quality involves lying—intentionally saying things that are untrue—or else saying things that you don't have enough evidence for.

If your housemate asks you what day garbage is being collected this week, and you can't really remember but you think it might be Tuesday or Wednesday, you would be violating the maxim of quality if you confidently replied: "*Garbage pickup is definitely Wednesday this week.*"

Flouting the maxim of quality usually involves irony or sarcasm. For example, consider the following mini-dialogue between a child on a road-trip and their parent:

(19) **Child, asking for the 20th time:**Are we there yet?
Parent, fed up with answering: Nope, we're just going to keep driving in this car for the rest of our lives.

In this case the parent doesn't intend their child to take their words literally; they're **flouting** the maxim of quality to convey an implicature that the question was unwelcome.

Metaphors or idioms are also cases of flouting the maxim of quality! If I say a scarf is *as light as a feather*, this is not literally true—but I don't intend for it to be taken as true!

12.3.3 Maxim of Relevance

The maxim of **relevance** states:

- Be relevant.

The idea behind this maxim is that when we converse, we shouldn't introduce irrelevant topics—we try to stick to the topic of conversation, and we assume that our contributions will be interpreted in that light.

Consider the following exchange:

(20) A: Are you visiting family this weekend?
B: I have a term paper due on Monday.

A natural interpretation of this exchange is that B is saying that they do *not* plan to visit family this weekend, and that the reason is that they have to work instead.

But this interpretation is an **implicature**, because if we think only about the literal meaning of B's words, this interpretation is a bit mysterious—B doesn't actually directly answer A's question, but introduces new topic that doesn't have anything to do with travel or families.

If we assume that B does intend to be relevant, though, we can explain the implicature: for the term paper to be relevant to the question about travel, it must be that working on the paper controls whether B is able to travel to visit family.

Indeed, suppose we know that B finds it easier to write term papers at home for some reason. In that case we might interpret their statement above as meaning that they **do** plan to visit family. This illustrates the type of context dependency that's typical of conversational implicatures!

Violating the maxim of relevance means making irrelevant contributions. You might do this because you're absent-minded, or because you aren't actually paying attention to what the other person is talking about, but you can also violate the maxim of relevance more subtly. Consider a slightly different dialogue:

(21) C: Are you free to hang out this weekend?
D: I have a term paper due on Monday.

Imagine this dialogue uttered in a context where D does actually have time to hang out, but for whatever reason doesn't want to spend time with C. Assuming D does have a term paper due on Monday (and therefore is not violating the maxim of Quality), their response would violate relevance: they're saying something true but irrelevant, in the hopes that C will draw the (incorrect) implicature that D doesn't have time to hang out because of the time needed to work on the term paper.

Flouting the maxim of relevance involves saying something obviously irrelevant, often to communicate that you want to change the topic of conversation.

For example, if a conversation starts getting awkward and you interject by saying: "*How about that hockey game last night?*" (when nobody had been talking about sports, never mind about hockey), then you would be **flouting** the maxim of relevance in the hopes that your audience would understand that you were trying to convey: "*Can we please talk about something, anything, else?*"

12.3.4 Maxim of Manner

The maxim of **manner** states:

- Avoid obscurity of expression. (That is, don't use words or phrases that are hard to understand.)
- Avoid ambiguity.
- Be brief.
- Be orderly.

This relates not to the content of what you say, but the way you express yourself.

It is easiest to discuss each of these sub-maxims in turn, because they have slightly different effect in conversation.

12.3.4.1 Avoid obscurity of expression

To follow this maxim, we try to use words and expressions that our audience understands. For example, the terminology you would use when explaining a topic in a university class is different from the terminology you'd use if talking about the same thing to a Grade 1 class!

Violating this sub-maxim involves using words and phrases your audience doesn't know. We often do this accidentally—for example, your linguistics professor might accidentally use a grammatical term that they haven't defined in class—but if you use a word that you suspect your audience will misinterpret, with the goal of misleading your audience, that would also be a violation of this sub-maxim.

Flouting this sub-maxim would involve intentionally using words that you don't expect your audience to understand—in most contexts, this would be with the goal of conveying something like: "I'm smarter /know more than you do", which is pretentious and rude.

12.3.4.2 Avoid ambiguity

To follow this sub-maxim, we try to avoid saying things that can reasonably be interpreted in more than one way.

It's very easy to **violate** this sub-maxim accidentally, because often you don't see the ambiguity in something you say until it's pointed out to you! But again, you can be intentionally ambiguous in the hopes of misleading people—this is an uncooperative way of talking.

Flouting this sub-maxim often happens in certain kinds of jokes, as in the following:

(22) A man walks into a bar. Ouch!

This joke turns on two things: 1. being familiar with the common joke set up: "*Someone walks into a bar.*" and 2. intentionally using the other meaning of the ambiguous word *bar*.

12.3.4.3 Be brief

To follow this sub-maxim, we avoid going on at great length when a shorter statement would do.

Violating this sub-maxim involves saying or writing something much longer than is needed.

Flouting this maxim is more subtle. One example is avoiding a single word and instead using a long paraphrase, as in:

(23) A: What did you have for dinner last night?
B: Well, we combined all the ingredients listed in a recipe for *risotto milanese*, in the indicated order, and the result was edible.

By using this long paraphrase, instead of saying "*We made risotto milanese.*", the second speaker's response gives rise to the implicature that the recipe didn't turn out as intended, or wasn't very good.

12.3.4.4 Be orderly

To follow this sub-maxim, we list or relate things in an order that makes sense. For example, when telling a story, we usually start at the beginning and then relate events in the order they happened in.

Violating this sub-maxim can be very confusing, as you'll know if you've ever had to interrupt someone for clarification about the order of events in a story they're telling!

Flouting this sub-maxim is not something we would do very often. A possible example might be intentionally relating events out of order when writing a fictional story, to convey something about the mood or the narrator's state of mind.

Part V

Sociolinguistics

Chapter 13

Winter Week 1: Politeness and Conversation

Contents

13.1 Communication in Context

Sociolinguistics is the study of how language is embedded in social relations and in a cultural context. In sociolinguistics we investigate questions such as:

- How does the way people speak vary across speech communities?
- How setting or audience influence the way people speak?

- What are the social and cultural norms of language use?
- How does society influence language?

Similar questions are investigated in **linguistic anthropology** (a subdiscipline of anthropology). These questions are also related to topics in pragmatics, as well as in historical linguistics (the study of language change over time).

In this unit we'll sample some of the areas often studied within sociolinguistics. We'll begin by looking at two topics in the sociolinguistics of interaction, **conversation** and **politeness.**

13.2 Conversation

In the context of formal syntax and semantics last term, we looked at full sentences in isolation—not in conversation. Many of our examples were *constructed*—that is, they were made up to illustrate specific grammatical constructions, rather than collected from actual records of speech or writing.

There are good reasons for this! Our knowledge of language definitely includes knowledge of the structure of these kinds of complete sentences independent of context, and it includes knowledge of the structure of sentences we've never heard before (and that aren't very common in day-to-day language).

But much of our daily use of language is in conversation, where we engage with and take turns with other speakers. Our ability to do this is *also* part of our knowledge of language!

We might think that conversation works like a movie or play script, where we take turns uttering complete sentences, and don't speak over one another. This type of dialogue is almost universal in movies, plays, and television shows, as well as in formal styles of "conversations" like interviews.

But if you compare everyday conversations to dialogue from movies or TV, you'll find that they sound very different! In everyday conversation we find:

- fragments
- false starts and corrections
- overlap between speakers ("talking over each other")
- backchannel responses ("uh huh" "right" etc.)

You can see detailed examples of transcripts of naturally occurring conversation by viewing this YouTube video[1] or this article[2]—or just by doing a Google image search for "conversation analysis transcripts".

These natural conversations might look messy or chaotic, but what the study of conversation by researchers in **Conversation Analysis**—a field that goes back to the 1960s and 1970s, in work like Sacks et al. 1978)—has discovered is that conversation is nonetheless **highly structured** and **rule governed**.

Consider **turn taking**. The pauses between turns in conversation vary across different social and cultural contexts, but they're always very short, with average pause lengths ranging from just a few milliseconds for typical conversations in some languages, up to around 400 milliseconds (still less than half a second) in others (Stivers et al., 2009). Most of our pauses in conversation are so short that we have to plan the start of our turn (i.e. our brain has to start signalling our mouth to move) before the other person has completely finished their turn. That means we have to be really good at predicting when someone else's turn is about to end. To do that we need to pay attention to **cues** that signal the end of someone else's turn—and many of those cues are culture or context specific.

We can also use cues to indicate that we're **holding the floor**. An example of a floor holding strategy is **uptalk**—the use of rising intonation at the end of sentences. The type of rising intonation used in uptalk is a way to signal that you aren't finished speaking yet, to prevent people from interrupting you.

For an introduction to conversation analysis and discourse analysis, see Wooffitt (2005).

13.2.1 Variation in Conversation Style

The rules of conversation—"rules" in the same sense as syntactic rules, the generalizations about how people actually speak—vary across different social and cultural contexts. That includes variation across countries or languages, variation across different places within a country, variation across social groups, across different families, and even across individuals.

One type of variation is described by the linguist Deborah Tannen as on a scale between **high involvement** and **high consideration** conversation styles (Tannen, 2005).

[1] https://youtu.be/I1LpiIDKp2I
[2] http://liso-archives.liso.ucsb.edu/Jefferson/Transcript.pdf

High involvement styles are characterized by a high degree of overlap, even finishing one another's sentences, and very short pauses. High consideration, by contrast, involves longer pauses and greater care not to interrupt.

If you are used to one of these conversation styles, and try to have a conversation with someone who uses the other style, it can be very difficult! A high involvement person might keep talking—assuming that the other person will cut in if they have something to say—while a high consideration person never feels there's been enough of a pause for them to take a turn.

Knowing about this kind of difference in conversation styles, by contrast, can help you navigate those differences! This point is made in the episode of the Lingthusiasm podcast linked in this week's Bonus Materials.

13.3 Politeness

Another topic we can study in the sociolinguistics of interaction: **politeness**. In the linguistic study of politeness we ask questions like:

- What linguistic resources do speakers in different communities, or speakers of different languages, use to express politeness?
- What social factors are relevant when being polite?

Politeness is often equated with being considerate or respectful of other people—but that doesn't mean that it's objective or invariant. What counts as polite and considerate behaviour in one social context might come across as impolite in another!

To see an illustration of this, consider an example of non-linguistic politeness: table manners. Depending on where you grew up, you might have been taught rules for polite dining like:

- Hold your fork in your left hand (and don't switch it between hands)
- No elbows on the table
- Don't stick chopsticks upright in your bowl
- Eat food with only your right hand

While there might be historical or cultural reasons these became established as "rules", there's nothing intrinsic about (for example) which hand you eat with that is objectively more or less appropriate or polite!

The same thing goes for linguistic politeness. We can identify patterns of how different languages encode politeness, but the specifics vary, both in terms of the grammatical details employed and in terms of the social divisions that speakers take into account.

13.3.1 Forms of Address

Let's start by looking at **forms of address** as they relate to politeness, how people refer to themselves, their audience, and to other people.

13.4 Names

The conventions around **names** vary a great deal from place to place, both in terms of how names and naming work, and in terms of how you use names to refer to other people.

The tradition in most English speaking countries—as well as generally in Europe and other places where languages originally from Europe are spoken—is that people have at least two names: a **given name** (often called a first name) and a **family name** (last name).

Full names (given name + family name) are not commonly used to address people, particularly not people you know personally. They're often used for public figures (actors and politicians, for example) or when referring to people in formal or public settings.

In formal settings, it is common in English to use a title followed by someone's family name. Many titles are associated with particular jobs, but the default titles in English are gender specific (**Mr**, **Ms**, and **Mx**), and for women the titles **Miss** and **Mrs** used to be more common and also convey marital status.

The use of titles with family names used to be more common, but now in most English-speaking contexts, including in North America, it is more common to refer to people by their given name only.

This doesn't mean that we are *less polite* now than we used to be, only that the standard of what it means to be polite has changed. The use of first names emphasizes solidarity or connection between people, while the use of titles emphasizes distance and autonomy.

The norms around how names are used varies a lot from place to place! Part of learning how to interact in a new social context is learning what the differences are in the standards of politeness.

13.5 Honourifics

While all languages have something like names that are used to refer to other people, some languages have other linguistic resources that are used to indicate respect.

One of these is the use of **honourifics** in languages like Japanese. Honourifics are a bit like titles, but are used much more widely, and can be attached to given names, family names, or full names.

Some examples of honourifics:

- *-san*: a default marker of politeness
- *-chan*: a familiar honourifics used for children and women
- *-sama* a highly respectful suffix

13.6 Pronouns

Finally, many languages mark social relationships on their pronouns. This is mostly the case for **second person pronouns**—that is, pronouns that refer to the person you are speaking to. In many varieties of English we only have one second person pronoun, *you*, without even a distinction between singular and plural, but that isn't the case in other languages.

For example, in **French** the informal singular pronoun is **tu**, and then one pronoun is used for the plural and for the polite singular, **vous**.

Using a plural pronoun as a polite second person is very common! In fact, historically we had the same system in English, with the informal singular **thou**, with **you** used both for the plural and for the formal singular. When **thou** fell out of use, we lost both the marking of number and the marking of politeness on pronouns.

(In contemporary English there is a tiny remnant of a formal use of a plural pronoun in the use of **we** as a first-person pronoun by royalty. Imagine Queen Victoria saying "We are not amused", by which she meant that *she* was not amused.)

Another strategy for marking a polite second person is to use a **third** person pronoun. This is the case in **German**, where there's a contrast between informal **du**/**ihr** (singular plural) and formal **Sie** (both singular and plural). **Sie** is the same as the third person pronoun meaning "she" or "they (plural)", and shows the same agreement on verbs.

Spanish also has formal second person pronouns that were historically derived from the third person. The informal singular second person is **tu**

or **vos** (depending sometimes on the variety of Spanish), while the formal singular second person is **usted**, historically derived from *vuestra merced* "your grace".

Note: *vos* was historically a plural pronoun (back in Latin), which then became a polite singular pronoun, and then ultimately became an informal pronoun. It is still used as a polite or plural pronoun in some varieties of Spanish.

13.6.1 Grammatical Politeness: Speech Levels

Some languages have ways of speaking politely that don't relate directly to forms of address.

In some languages these involve a special vocabulary used in certain contexts, but in others it is part of the inflectional system and the syntax of the language.

The languages that are best known for this type of grammatical politeness are **Japanese** and **Korean**, both of which have multiple levels or types of politeness that can be expressed in speech. These levels are indicated by suffixes on the main verb of each sentence, and (to some extent) by the choice of vocabulary.

Polite speech often reflects two aspects of the relationship between the speaker and the hearer. One of these is that the speaker might **humble** themself; the other is that they might express **respect for the hearer**.

In Japanese, for example, there are at least three speech levels beyond "plain" or "neutral" language:

- teineigo ("polite language") for example: used by television presenters, often the first forms taught to students learning Japanese
- sonkeigo ("respectful language") for example: used when addressing superiors or customers
- kenjōgo ("humble language") used when describing your own actions, not the actions of others

Korean has even more levels, at least seven, though some of these are no longer used in modern society.

13.6.2 Indirectness

If we don't have politeness distinctions on our pronouns, and don't have speech styles to grammatically indicate politeness, what linguistic resources do we use to mark politeness in a language like English?

We do have specific politeness vocabulary in English, like *please* and *thank you*. But most politeness strategies in English involve **indirectness**.

We often use indirectness to soften requests or instructions. For example, if you hear the doorbell, it might feel impolite to use an imperative to request that your housemate answer the door, even if you add "please":

(1) "Please answer the door."

So to soften the request, you might turn it into a question:

(2) "Could you answer the door?"

Technically the answer to this would just be "yes" or "no"! But in context (using Gricean maxims!) the intention is to convey a request to answer the door.

We can also be indirect by putting the request in an embedded clause:

(3) "I wonder if you could answer the door."

Or by adding an *if*-clause:

(4) "If it wouldn't be too much trouble, could you answer the door?"

These are all ways of being polite by somehow making the request less direct. They use other linguistic resources—questions, embedding, etc.—to mark politeness.

13.6.3 Face Theory of Politeness

Brown and Levinson (1987) proposed an influential theory of politeness known as the **face theory of politeness** or a **face-based theory**. This name derives from the idiom "to lose face", meaning to have your reputation damaged. This is a theory that aims to describe why certain ways of speaking are judged to be polite, but also to describe some of the ways politeness varies across communities and cultures.

Your face, in this theory is your **projected self-image**. There is both **positive face**, your desire to be approved of and seen in a good light, and **negative face**, your desire not to be imposed on.

Interacting with other people involves **face threatening acts**.

You can threaten someone's **positive** face by ignoring them, being indifferent, or actively insulting them.

- therefore **impolite** to interrupt, to bring up sensitive topics, to complain
- therefore **polite** to compliment, to say "thank you" to greet people

You can also threaten someone's **negative** face by taking away some of their options or freedom, or by requiring them to do things (making demands on them).

- therefore **impolite** to give orders, to ask questions
- therefore **polite** to frame orders as questions

Part of Brown and Levinson's proposal is that different groups of people (whether that means families or nations) might place different relative value on positive or negative face, and thus on positive vs. negative forms of politeness.

Prioritizing positive politeness means prioritizing friendliness, solidarity, and reciprocity.

Prioritizing negative politeness means prioritizing autonomy and privacy.

Chapter 14

Winter Week 2: Linguistic Variation and Identity

Contents

14.1 Language, Identity, and Power

In the remainder of our unit on sociolinguistics we're focusing on **sociolinguistic variation**: how various aspects of identity can influence the way people speak, and how people **use** language to express or encode their identity.

The way we speak can reflect any aspect of our background or identity, but some of the aspects that come up most often in sociolinguistic studies are:

- where you're from (geographical variation)
- age
- gender
- class
- educational background
- race or ethnicity

First, some terminology: outside of linguistics, we often talk about variation in how we speak in terms of *accents* or *dialects*. But these words have certain connotations: "accent" often implies a difference just in pronunciation, while "dialect" implies some kind of regional grammatical difference.

In linguistics we sometimes refer to accents or dialects, but more often we use the more neutral term **variety**. A language variety is any way of speaking—in principle there can be as many varieties as there are speakers, but often we will speak of varieties that correlate with aspects of identity like the ones listed above.

Everyone has an accent. One reason to avoid the word "accent" is that it's often contrasted with "unaccented" speech. But there's no such thing as "unaccented English", or even a "neutral" accent! Everyone speaks in a way that reflects their background, even people who speak a "standard" variety (on which more below).

Unfortunately, not all varieties are always perceived as being of equal value—just as not all languages are always perceived as being of equal value.

Our attitudes about different language varieties—positive and negative—lead to linguistic **bias**. We all have linguistic biases, we all make judgements about people based on *how* they talk (rather than on what they say).

- One example of linguistic bias is the attitude most North Americans have about varieties of English spoken in the UK. North Americans tend to perceive all varieties from the UK has having **high prestige**—they tend to evaluate speakers who speak such varieties as being more intelligent or better educated.
- This is true even for varieties that in the UK are associated with comparatively **low prestige**. This is a case where someone may experience very different—even opposite—reactions to the way they speak, depending on where they are.

A benefit of studying sociolinguistics is that it can help us be aware of our own linguistic biases, which can in turn help us work past them!

14.1.1 Language "Standards"

Often one variety of a language is identified as the "standard" variety—or else we might talk about different standards depending on the size of area we're talking about.

So we might talk about "Standard Canadian English", "Standard North American English", or even just "Standard English".

But what makes a particular variety the "standard"?

In some cases there is an official governmental body that decides on and enforces the standard variety—usually through education and official publications. For French, for example, the *Académie française* defines the official standard for France, and to some extent for other countries as well.

English has never had such an official body, in England or in any other country, so what makes "standard English" the standard?

To some extent, "standard English" is defined by influential dictionaries, usage guides, and prestigious publications or widely-circulated dictionaries. But the form of language these sources enforce—much like the form encoded by official bodies like the *Académie française*—isn't chosen out of nowhere, and isn't somehow objectively determined to be the "best" or "clearest" variety. (Remember from the beginning of the year: all languages and all varieties of languages are equally expressive and equally valid!)

Instead, the "standard" variety of a language is usually the variety spoken by the part of society that has the most power, whether that's economic, social, or political power. For many languages this is (at least historically) a variety spoken in a capital city, or by a dominant political class.

For English and other European languages, the "standard" variety is usually the one spoken by middle and upper class people with a certain

amount of education—and in cases where there are ethnic or racial differences across varieties, the standard is the one spoken by white people.

This is particularly visible in the United States, where a particular variety of English is associated with Black speakers. This variety is known variously as **African American Language**, **African American Vernacular English**, **Black English**, or **Ebonics**. Not all Black Americans speak this variety, and not all speakers of this variety are Black, but this variety is strongly associated with Black American communities and identity. Though African American Vernacular English (AAVE) is spoken widely, "standard" American English is often identified with varieties spoken by white communities in certain parts of the country.

What's wrong with a language standardization?

We often think of having a "standard" variety of a language as a good thing—or at least as a neutral thing. We're used to having a single variety of English appear in (most) written sources, for example.

It's particularly easy to regard standardization as positive if the variety you grew up speaking is relatively close to the standard taught in schools (especially for a language like English where spelling is somewhat loosely related to pronunciation anyway).

The existence of an enforced standard—even a relatively "soft" standard like the one in English—creates a barrier to anyone who **doesn't** come from a family where that's the variety spoken at home.

- As a somewhat remote example: for many years the BBC required all presenters to speak with a particular variety ("BBC English"). This meant that anyone with a regional accent in the UK couldn't work as a public radio announcer or television presenter unless they acquired a new variety of English.

- African American Vernacular English (AAVE) has many grammatical differences from varieties spoken by white communities in the US. When school takes place only in "standard" English, this means that students who speak AAVE at home face a language barrier that other students don't.

It's useful to think critically about the idea of language "standards", rather than to simply assume that the existence of a standard variety is a necessary or automatic part of life.

14.1.2 Methods in Sociolinguistics

When studying sociolinguistic variation, we're interested in how people naturally speak. But in formal university or research settings, people tend to use more "standard" speech varieties or styles.

A range of methods are used to investigate language variation:

Dialect Surveys One longstanding sociolinguistic method is the use of dialect surveys. This involves administering a questionnaire to participants, usually looking for **regional** variation.

- In very early work—in the 1800s and early 1900s—the goal was to investigate the speech of the *most conservative* local speakers, who were presumed to speak the most genuine form of a local variety. These are typically older speakers who have comparatively little formal education and who haven't travelled much. Modern surveys aim to recruit participants from a wider range of backgrounds, to measure not only how language used to be spoken but how it's now spoken, and how it might be changing. Surveys are necessarily comparatively short, and often focus on specific linguistic forms (vocabulary, pronunciation, or particular constructions).

Sociolinguistic Interviews Sociolinguistic interviews are long-form interviews that seek to record a range of natural speech styles from participants. Often they involve both less-structured questions and more formal speech (reading passages or word lists). A variety of methods are used to elicit more natural speech, for example having a member of a speech community conduct the interviews, or asking questions that get participants caught up in their answers.

Corpus-based Studies Many sociolinguistics studies use a corpus of recordings or texts to investigate natural speech. For example, if I did a study of how language is used on Twitter by collecting a large number of tweets, this would be a corpus study. (Corpus is Latin for "body", so a corpus is just a body of texts.)

The methods above aim to investigate how people *use* language. We can also investigate how people *perceive* language. One important method for this kind of study is a **matched guise** study.

In a matched guise study, participants listen (or in some cases watch) the same content delivered under two different "guises". For example, they

might listen to someone speaking two different varieties of English, or they might listen to the same recording but while looking at two different photos. What the participants don't know is that they're listening to the **same** speaker under the different guises. Participants are then asked to evaluate the different samples they listened to, as a way of seeing how the **guise** influences their perception of the speaker.

You can learn more about matched guise studies in Chapter 5.4 of the Essentials of Linguistics textbook[1].

14.2 Language and Race

A number of resources on language, race, and racism are linked in the bonus materials for this unit. The TED talk by Jamila Lyiscott is a more personal reflection on the experience of language as it reflects and shapes personal identity.

14.3 Language and Gender

One aspect of identity that we can look at from a sociolinguistic perspective is **gender**. We can look not only at how our gender influences the way we speak, but also at topics like grammatical gender, and how we talk *about* gender in language.

14.3.1 Terminology: Sex vs. Gender

In discussions of gender, including gender and language, what people mean by "gender" and "sex" is sometimes unclear.

To some extent this is because the way these words are used has changed somewhat over the years. The origin of "gender" is the same as the word "genre", and it originally referred specifically to *grammatical* gender, the classification of nouns as masculine or feminine (or neuter, in some languages).

In contemporary English, however, both **sex** and **gender** refer to properties of people, not just nouns.

Sex A **physical** or **biological** property. We can talk about *genetic* or *chromosomal* sex (i.e. whether you have XX or XY chromosomes, or some other

[1] https://ecampusontario.pressbooks.pub/essentialsoflinguistics/chapter/5-3-attitudes-about-accents/

combination), about the balance of *sex hormones* (estrogen and testosterone, primarily), or about physical sexual characteristics. Though genetics, hormones, and physical features tend to correlate for most people (and other animals), they can and do diverge in many cases.

Gender When applied to people, gender refers to a social or conceptual category. We can distinguish:

- gender identity: your internal knowledge or feeling as belonging to a particular gender
- gender expression: how you express your gender
- gender roles: the social expectations or norms associated with particular genders

We commonly assign gender to infants based on their physical sexual characteristics. If someone's gender identity matches the gender they were assigned at birth, they are *cisgender* or simply *cis* (a *cis man* or *cis woman*). If someone identifies with a different gender than they were assigned at birth, they are *transgender* or simply trans (a *trans man* or *trans woman*; many nonbinary people also identify as trans).

Aside: *cis-* and *trans-* were originally Latin prefixes meaning "on the same side" and "on the other side /a different side". Their development in English into free morphemes is very morphologically interesting!

14.3.2 Sex vs. Gender in language variation: the case of pitch

Having distinguished sex from gender, we might ask: are there *sex*-based differences in how we speak?

For the most part, there are not—there is no good evidence that sex differences relate to differences in the parts of the brain associated with language, for example.

There are some physical differences that give rise to differences in average voice quality or pitch, though.

For example, men are on average *larger* than women. This includes having larger mouths and throats, which is correlated with having a deeper voice.

But also, differences in voice quality can be linked to the effect of hormones on the voice box, or **larynx**.

We'll learn more about the larynx in our unit on phonology, but if you hum or say "ah" and put your hand on your throat, you will probably be able to feel your larynx vibrate. For many men it's also visible as the "Adam's apple" in the throat.

The visible Adam's apple is one of the effects of testosterone, which also thickens the cartilage within the voice box itself. This results in slightly stiffer "vocal cords" (which we call **vocal folds** in phonetics), which also tends to result in a deeper voice.

But is this physical difference responsible for **all** the difference in average pitch between men and women?

A variety of studies have shown that it's **not**—there are independent gender-based differences in how we use our vocal range.

For example, Ohara (1999) recorded native Japanese speakers with proficient English (in Hawaii), and found that women had relatively higher pitch when speaking Japanese, and relatively lower pitch when speaking English. Ohara found no difference among men, but other studies have found that men who are native Japanese speakers speak on average at a lower pitch than men who are native English speakers do.

Independently, it's been reported that English speaking women tend to speak at a comparatively low part of their vocal range—this is related to the phenomenon of *vocal fry* or *creaky voice* that people notice in women's speech (though many men also exhibit vocal fry).

14.3.3 Language, Gender, and Change

In sociolinguistics we're often interested not just in how language use varies, but in how it's *changing*.

One way of investigating language change is to measure change in **real time**. This means investigating what people do at regular time intervals, either by looking at older records or by conducting a study over years or decades.

There are limits to real time studies, though! If we want to study change in the past, we're limited to what records happen to be available. If we want to study change now, we have to wait around to see what changes happen to take place in the next 10, 20, 30 years.

Another way of looking at current change is to do an **apparent time** study. In an apparent time study you use the age of participants to stand in for language change. This rests on the assumption—fairly well estab-

lished—that a lot of our linguistic behaviour doesn't change much over the course of our lifetime. You might be aware of this if you've ever noticed differences in how you, your parents, and your grandparents speak.

Using apparent time, we look at how (for example) people aged 15, 30, 45, and 60 speak now, and use that to look at changes over the last 45 years.

How does this relate to gender? An interesting finding in sociolinguistics is that for most changes (not all changes), women are slightly "ahead" of men in the change—that is, women use the new way of speaking at slightly higher rates than men do. Since younger speakers usually use newer forms of language as well, this means that **teenage women** tend to lead language changes—the way teenagers (and teenage women in particular) speak today is the way most people will speak in a few decades.

14.3.4 Grammatical Gender

Languages have grammatical gender if nouns are divided into classes or categories that use the same pronouns (or same agreement) that are used for men and women. In other words, grammatical gender means a language uses pronouns like "he" and "she" to refer to inanimate objects like rocks and trees and chairs.

Only about a third of the world's languages have grammatical gender of this kind. Others divide nouns into other categories (like animate and inanimate), but the most common pattern by far is to have no grammatical gender at all.

How does grammatical gender interact with social gender? In a language like English, we don't have grammatical gender, but we do mark gender on pronouns. This has led to a linguistic gap: while we can use *he* to refer to men and *she* to refer to women, English historically lacked a pronoun to refer to people who were neither men nor women.

Dating back to Middle English (around the 1400s), the pronoun *they* has been used to refer to nonspecific third persons, or in cases where we don't know the gender of the person we're referring to. For example:

(1) Someone forgot their scarf in here. (nonspecific)

(2) There's a person outside, but I can't see who they are. (unknown)

In contemporary English, this use of *they* has been extended to fill the gap as a nonbinary pronoun. People have also innovated other nonbinary pronouns as other ways to fill the gap in the English pronoun system.

In a language with grammatical gender, the issue of innovating a new nonbinary pronoun is in some ways more complex, because gender is expressed not just on pronouns but on nouns and adjectives that *agree* with someone's gender.

This has been dealt with in different ways in different languages! In Spanish, for example, the ending *-e* (which already existed for some words) has been generalized, so that alongside *latino* (masculine) and *latina* (feminine) you have *latine* (nonspecific or nonbinary).

In French the gender endings are not quite so transparent, but the nonbinary pronouns *iel* and *ille* have been innovated, and speakers choose whether to use masculine or feminine endings, or a mix of both.

14.3.5 Gender and Language Stereotypes

Another topic we can investigate in sociolinguistics is the existence of linguistic stereotypes. In the case of gender, for example, there are stereotypes about women speaking *more* than men, or speaking on more trivial topics.

When researchers have looked at whether there are gender-based differences like this, though, they have not found that women speak more, or that they gossip more. Instead, in mixed-group settings men and women speak about equally, or else men speak more than women do.

If you're interested in reading about a quick quantitative study on this topic, I recommend this Language Log post from September 2006[2], which reports on a very quick corpus-based study of conversation among men and women. (Note: the Language Log post is framed in terms of "sex" differences, but in the terms we're using here these would all be gender differences.)

14.3.6 Talking about gender

Finally, one of the topics we can look at in sociolinguistics is how we talk *about* different groups of people. Often this involves looking at the metaphors we use, or even what types of descriptions count as insults.

In the case of gender, there are many gender-based insults in English—and in other languages. Many of these insults rest on it being a bad thing to be called a girl, and that in turn tells us something about how we think about the value of men vs. women.

We can look at this in more subtle ways as well, though! For example, if you look at international sports you may notice that some are divided

[2] http://itre.cis.upenn.edu/~myl/languagelog/archives/003607.html

into *Men's* and *Women's* divisions, while others are *Men's* and *Ladies'*. A generation ago, you would find sports at the Olympics divided into *Men's* and *Girls'*.

On the one hand, we might think that using "ladies" to describe some sports divisions is relatively trivial, but such differences subtly reinforce now just how we talk about gender differences, but how we think about them and perceive them.

Chapter 15

Winter Week 3: Regional Variation in Canadian English

Contents

Note: At a few points in this guide I use symbols of the IPA (International Phonetic Alphabet) to describe specific vowel sounds. You'll also see the IPA in the Tour of US English video that was posted for this week! You aren't expected to know any of these symbols yet—we'll be introducing them in Week 4—but I've included them here so that you start getting used to seeing them.

15.1 Regional Variation

We've been talking about variation, but until now we haven't focused on the first type of variation that people often think of: **regional** (aka geographic) **variation**. This is any variation that is determined by *place*, whether the place is where you grew up or where you live now.

Regional variation can be highly local—by town even by neighbourhood—but we can also identify large regional areas, within which we see broadly similar patterns of speech.

To begin, let's introduce some terminology that will be useful when talking about regional variation.

First of all, a **sociolinguistic variable** (or just "variable") is any aspect of speech that's subject to variation—not just regional variation, but also variation based on other aspects of identity. The different ways a variable shows up in the way people speak are the **variants** of the variable.

As an example, one **variable** that's come up in class a few times is: what do you call a carbonated drink, typically sweetened? Some of the **variants** that exist for this variable are: *pop*, *soda*, *soft drink*, *tonic*, *coke*, etc.

Another sociolinguistic variable in English is the form for a second person plural pronoun; the variants here are *you*, *y'all*, *youse*, *you guys*, etc.

A lot of the variables we talk about in the context of regional variation in English involve **phonetics** (pronunciation). For example, a variable might be: what vowel sound occurs in the first syllable of words like *process* and *progress*? The variants are [ɑ] (the vowel in *spa*) and [o] (the vowel in *throw*).

When looking at regional variation, we often end up drawing lines on maps to divide areas where different variants predominate. Such lines are called **isoglosses**.

Isoglosses are an *abstraction* over the speech of individuals. It's never the case that everyone on one side of a line always speaks one way, while everyone on the other side of the line always speaks another way. Instead, what isoglosses represent is something like a trend line on a graph: on one side of an isogloss, *most* people use variant A, while on the other side, *most* people use variant B. For this reason, when sociolinguists report their results, they often show dots on a map corresponding to all the *individual* responses they collected, in addition to lines representing their claims about regional boundaries.

Several speech areas in the Eastern United States are discussed in the video posted this week; the content of that video won't be recapped in this

written topic guide! One more abstract point that's worth repeating, though, is that the amount of variation you find in a place correlates both with how long it's been settled, and how densely it's settled.

Focusing on English speaking countries, you find the most variation in the UK, where English has been spoken ever since it has existed as a distinct language. There is much less variation in other English speaking countries, including geographically very large countries like Canada, the US, and Australia—though even in North America, we find much more variation on the East coast (where English has been spoken longer, and which is more densely settled) than we do on the West coast.

(Old English arose around 500 CE. It developed from the Germanic language that would have been spoken by the Anglo-Saxon people who arrived in England after it ceased to be part of the Roman empire.)

In this topic guide, and in the associated video, I focus on some of the variables that characterize what's usually called Canadian English.

15.2 Regional Variation in English Canada

What's usually called **Canadian English** is really only characteristic of Ontario and the provinces further West (Manitoba, Saskatchewan, Alberta, and BC). While there's still variation within this area—someone from Kingston doesn't necessarily sound just like someone from Toronto, doesn't necessarily sound just like someone from Saskatoon, doesn't necessarily sound just like someone from Vancouver—a lot of that variation is a matter of degree rather than of sharp divides.

By contrast, there often *are* sharp divides between English in Canada and English in the bordering areas of the United States—many *isoglosses* run along the Canada-US border.

There are at least three other significant regions when it comes to varieties of English spoken in Canada:

Maritime English is spoken in the Maritimes (the provinces of New Brunswick, Nova Scotia, and Prince Edward Island). This is distinct from **Newfoundland English**—the province of Newfoundland and Labrador is geographically quite distant from all the other English-speaking provinces, and also only entered confederation (=joined Canada) in 1949 (prior to that it was a dominion of the British Empire).

Finally, varieties of English spoken in Quebec, particularly in the city of Montreal, constitute another distinct region. The sociolinguist Charles Boburg has described several distinct sub-varieties of **Montreal English**,

each associated with a different historically-anglophone ethnicity in the city; these are Italian Montreal English, Jewish Montreal English, and Irish Montreal English. These varieties have been insulated from one another, as well as from other major regional areas of Canadian English, by the surrounding French-speaking majority in Quebec.

15.2.1 Features of Canadian English

Any aspect of language structure can be subject to variation: the words we use (our vocabulary), our pronunciation, or or morphological or syntactic grammar. Often the variation that we're most conscious of, though, is variation in vocabulary and in pronunciation.

Many people think of Canadian English as "splitting the difference" between US English on the one hand and UK varieties of English on the other. And indeed, in many cases Canadian vocabulary or pronunciation might fall on one side or the other of a US/UK divide.

In Canada many people say *zed* for the last letter of the alphabet (UK), as opposed to saying *zee* (US). But in Canada the metal that is the 13th element in the periodic table is pronounced (and spelled) *aluminum* (US), not with an extra 'i' as in *alumin**i**um* (UK).

There are known "canadianisms" in vocabulary, however. For example:

- it's only in Canada that *pencil crayons* is the majority term for pencils that have a coloured wax instead of graphite.
- in Canada we say *Kraft Dinner** instead of *Kraft Macaroni and Cheese*, and though this is a brand name, it's also become a generic term for boxed macaroni with an instant cheese sauce.[1]
- the word *chesterfield* as a synonym for *couch* or *sofa* is uniquely Canadian, though this is now associated with older generations—most younger people probably say *couch* or *sofa*.

Looking at some examples of variation *within* Canadian English: as someone who grew up in BC, there are some words I use that are a bit different than the most common terms in Ontario:

[1] Did you know that Canadians consume more Kraft Dinner per capita than anyone else in the world[2]?

- *rain gutters* (not *eavestroughs*)
- *decal* pronounced DEE-kal not DEH-kul
- *kickball* (instead of *soccer baseball*)
- *cabin* (instead of *cottage*)
- *runners* (instead of *running shoes*)
- *garburator* (instead of *garbage disposal*)

There are also some words that are often pronounced differently in Canadian English than in many US varieties (and somewhat differently than in "standard" UK English).

- One of these is the first vowel in words like *sorry* or *borrow*, which sounds like the vowel in *force* or *sore* (in IPA: [ɔ]) rather than the vowel in *start* (in IPA: [ɑ]).

In other cases, the Canadian pronunciation of a set of words is different from the US pronunciation but clearly patterns with typical UK pronunciations.

- For example, the pronunciation of the first vowel in nouns like *process*, *produce*, *project*, *progress*, *protest* is more likely to be the same as the vowel in *boat* (IPA [o]) in Canada and the UK; in the US this vowel is much more likely to be the same as the vowel in dog (IPA [ɑ]).

On the other hand, Canada and the US sometimes pattern together, and differently from typical UK pronunciations. In both Canada and the US:

- the word *often* is pronounced by many speakers with a [t] in careful speech, but almost always with no [t] in the UK (the [t]-less pronunciation "offen" is in fact the older one; pronouncing the [t] is an innovation based on the spelling).
- many speakers use *gotten* as the past participle of the verb *get* in Canada and the US, whereas in the UK most speakers use the innovative form *got* (Compare *The door has gotten stuck.* with *The door has got stuck.*).

All the variables mentioned so far involve particular words, or particular sets of words. There are also very general **patterns** of pronunciation that distinguish Canadian English, patterns that apply to every single example of particular sounds in English.

In the next few sections I'll review a few of these.

15.2.1.1 Canadian Raising

One of the most famous features of Canadian English is the pronunciation of words like "about" and "house"—he stereotype is that these words sound like "aboot" and "hoose" when Canadians say them.

As most Canadians are quick to protest, we don't actually say "aboot"! But it's nonetheless true that many Canadians—particularly in Ontario but also further West—say these words in a way that's *closer* to "aboot" than most other English varieties do.

Consider the following lists of words:

(1) a. about
b. (the) house
c. bout

(2) a. loud
b. (to) house
c. bowed

(3) a. ice
b. write
c. type

(4) a. eyes
b. ride
c. jibe

In most varieties of English, the first two lists (*about*... and *loud*...) have the **same vowel sound**, as do the second two lists (*ice*... and *eyes*...)—with the first and third lists having vowels that might be a bit shorter in length.

In Canadian English, however, the words in (1) and (3) have all undergone a change. To describe that change, though, we need to preview some of what we'll learn about vowels next week.

The vowels in all these words are **diphthongs**. We'll learn more about this next week, but for now it's enough to say that a diphthong is a vowel that has two parts.

The basic pronunciation of the diphthongs shows up in all the words in (2) and (4): the vowel in *bowed* is [aʊ]; the vowel in *eyes* is [aɪ].

For the vowels in the words in (1) and (3), in Canadian English the first part of the diphthong **raises**, becoming more like the vowel in a word like *strut* (IPA [ʌ]), or for some speakers more like the vowel in *boat* ([o]). So the vowel in *bout* is [ʌʊ], and the vowel in *ice* is [ʌɪ].

Canadian English is one of a few varieties where this happens to *both* diphthongs, and one of the ones where it's very regular (for many speakers it applies even to new words). For this reason, this type of vowel change has come to be known as **Canadian Raising**.

This pattern is found throughout Canadian English—so from Ontario to BC—but is strongest in Ontario. As you move further West, you'll hear less and less distinctive Canadian Raising.

Canadian Raising is something that will come up again not only in LING 100, but also in future courses in linguistics, so it's worth taking a moment to try to hear the difference in these vowels, possibly by listening to me say some of these words in the video for this week.

15.2.1.2 Foreign 'A' nativization

Another feature of Canadian English is called **Foreign 'a' nativization**. This is something that Canada shares with other countries, but mostly doesn't share with US English.

Consider the pronunciation of the first 'a' in words like *pasta*, *Mazda*, *taco*, *plaza*, *pyjamas*, etc. As the name of the feature suggests, these words are all borrowed from a language other than English, where 'a' is pronounced as [a]—a vowel sound we don't actually have in English.

If you think of how 'a' is pronounced in Italian, or Japanese, or Spanish, or most other languages, it's not quite the same as any vowel we have in English. So when we borrow words with 'a', we have to decide: we can pronounce it like the vowel in *trap* ([æ]), or like the vowel in *ball* ([ɑ]).

In all varieties of English, sometimes the majority of people choose [æ] (the vowel in *trap*) for a certain word, and sometimes the majority of people choose [ɑ] (the vowel in *ball*). But in Canadian English the majority choice is much more likely to be [æ] than it is in most US varieties—and even for words like *taco* where the majority of Canadians do choose [ɑ], you're still more likely to hear the [æ] variant in Canada than you are in the US.

15.2.1.3 Retention of "yod"

For this feature, I strongly recommend watching the video, because without knowing the IPA it's difficult to describe!

Basically, there's a set of words in English that used to have what is called a **palatal glide** (the sound at the beginning of the word *yes*, IPA [j]), but where the glide (also called "yod") has been lost for many English speakers in North America after the sounds [t], [d], [s], [z], [n], and [l]

Canadians are slightly more likely to have kept the glide. For example, if you have kept the glide you may pronounce *due* (and *dew*) differently than you pronounce *do*.

(5) **Words with the glide:**

a. due /dew
b. Tuesday
c. tune
d. stupid
e. presume
f. news
g. lewd
h. lure

(6) **Words without the glide (even historically):**

a. do
b. toon
c. noon
d. loon

The list of sounds after which the glide [j] has gone away is a **natural class** (a term we'll encounter in Phonology): to preview a bit of phonetics we'll cover next week, they all have an **alveolar** place of articulation (they involve the tip of your tongue touching the roof of your mouth just behind your front teeth).

15.2.1.4 caught-cot merger

Canadian English shares two vowel mergers with most other North American English varieties, including the ones spoken in adjacent parts of the US. It's worth describing these mostly for the benefit of anyone taking LING 100 who **doesn't** have these mergers, so that you don't get confused when it looks like some vowel sounds are "missing" next week!

The first is known as the **cot-caught** merger.

Historically English distinguished two sets of **low back** vowels (we'll learn what "low" and "back" mean next week):

- [ɑ]: the vowel in words like *cot*, *lot*, *cloth*
- [ɔ]: the vowel in words like *caught*, *thought*, *sauce*

Some varieties of English still distinguish these two sets of words. These varieties include several spoken in the US, and most varieties in England.

In almost all varieties spoken in Canada, though, these two sets of words are pronounced with the same vowel, closest to the one originally found in *cot* (we will transcribe this as [ɑ]). The merger is also found in many US varieties, particularly those further West, and in varieties in Scotland and Ireland.

15.2.1.5 Mary-merry-merry merger

This is a merger found before the sound [r]—a lot of changes affect vowels before this sound!

Originally words like *Mary*, *merry*, and *marry* all had different vowel sounds: *Mary* the vowel in *bait* ([e]), *merry* the vowel in *bet* ([ɛ]), and *marry* the vowel in *bat* ([æ]).

For many English speakers, however, these vowels have all merged before [r], converging on the vowel in *bait* ([e]). As a result, *Mary*, *merry*, and *marry* are all pronounced identically—they're **homophones**.

★**The Canadian Shift** One of the distinctive features of Canadian English is a systematic change in the **lax front vowels** [ɪ], [ɛ], and [æ]. Describing the change is very difficult without having phonetic terminology in place, though, so if you'd like to learn more please ask in Week 4!

I mention it here mostly because the Canadian Shift is sometimes mentioned as the defining feature of Canadian English, the major feature that distinguishes it from most adjacent US varieties.

This shift is *not* attested in Maritime or Newfoundland English.

15.2.2 ★Other Regional Varieties in Canada

The above descriptions were focusing on the large regional variety that's usually called Canadian English, which stretches from Ontario to the West coast.

What about the other regional varieties in English Canada? Here we'll make a few shorter notes about each one.

15.2.2.1 Maritime English

Maritime English shares some of the features described above for Canadian English. For example, it has Canadian Raising (though is described as having *less* raising, much like the West coast). The raised diphthong is a bit

different for many speakers, though, so that *out* and *couch* (which both have the raised diphthong) end up homophonous with *oat* and *coach*.

One of the characteristics of Maritime English is the fronting of [ɑ] before [r], resulting in a distinctive pronunciation of words like *far* and *heart*.

15.2.2.2 Newfoundland English

Newfoundland English has a number of interesting *morphosyntactic* features, often attributed to influence from Irish English. These include:

- using *be after* to express a perfect meaning (like the one expressed with *have*)
- using the present tense *-s* with a wider range of subjects (e.g. *I loves it*.)
- *me* instead of *my* or *mine*

As for its pronunciation, the vowel system in Newfoundland English is quite different from the one in Canadian English. Newfoundland English lacks the Mary-merry-marry merger, but does have two other mergers: *cheer* and *chair*, and *line* and *loin*.

15.2.2.3 Montreal English(es)

Because there are several different varieties of English spoken in Montreal, it's difficult to make generalizations for all of them, but a few general statements are possible.

In terms of pronunciation, Montreal English speakers tend to have less Canadian Raising than speakers of Canadian English, despite being physically proximate to Ontario (where speakers raise the most).

The Mary-merry-marry merger is less likely to be complete for Montreal English speakers, who may distinguish at least two of the three vowels.

In addition to words and phrases borrowed from French (like *depanneur*, the word for corner store), Montreal English has a number of calqued words and expressions—that is, words that are literally translated from the corresponding French.

- In Montreal you might *open* or *close* the lights, rather than turning them on or off.

- Montreal is the only place in North America where the most common word for a carbonated beverage is a *soft drink*, sometimes attributed to the fact that on French menus it would be *liqueur douce*.
- an *animator* is the person who puts on a show or session (as opposed to someone who produces animated cartoons)

15.3 ⭐Regional Variation in French Canada

While we've focused on regional variation for English in Canada, there is regional variation in French as well! Here I say just a few words about variation in French across Canada—this section is definitely inadequate, we're simply focusing on English in Canada since that's the language most people in the class speak!

The variety of French spoken in Canada (and in neighbouring parts of the US as well!) is sometimes referred to collectively as **Laurentian French**, though the term **Quebec French** is sometimes used as the general name for the variety.

In addition to being the majority language in Quebec, French is spoken as a minority language in all other provinces. When studying variation outside Quebec, the most research has been done on **Acadian French** (spoken in the Maritimes, particularly New Brunswick), **Ontario French**, and **Métis French** (spoken in the praries).

This goes a bit beyond regional variation, but Métis French came into contact with varieties of Cree, giving rise to the language **Michif**, which is a **mixed language**: a language whose vocabulary and grammar resulted from the combination of two ancestor languages, as a result of widespread bilingualism in communities. The other mixed language spoken in Canada is **Chiac**, a mixture of English and French spoken in New Brunswick (and mentioned in class in Week 2).

Part VI

Phonetics

Chapter 16

Winter Week 4: Vowels and Consonants of English

Contents

Sections not in the videos for this week marked with ★. Some course material is covered only in the Crash Course Linguistics videos, *not* in the associated Content Lecture Videos.

Section 16.1 originally appeared at the end of the unit on Sociolinguistics, but has been moved to this chapter for consistency.

16.1 Introduction to Phonetics

Many of the variables we've seen across varieties—not just regional varieties but also ones based on other aspects of identity—have involved **pronunciation**. Studies that focus on this type of variation fall within **sociophonetics**: the study of variation that relates to sounds.

This makes it a good bridge to our unit on **phonetics** more generally!

Phonetics as a discipline of linguistics investigates the minimal units of language. For spoken languages these minimal units are **sounds**, which can be combined to make meaningful morphemes.

While "phonetics" originally referred to the study of sounds specifically, it is now more generally the study of language **perception and production**, and so we can also talk about the phonetics of signed languages. For signed languages like ASL, the minimal units aren't sounds but instead the different components of individual signs.

In order to study sounds, we need to be able to represent sounds precisely. For this reason, much of our time on phonetics in LING 100 will be spent becoming familiar with the **International Phonetic Alphabet (IPA)**, and how it is used to transcribe speech. Specifically, we'll focus on how the IPA is used to transcribe **(Canadian) English**.

16.1.1 Why bother with an International Phonetic Alphabet?

Why do we bother to learn a standard phonetic alphabet in LING 100?

The IPA was first developed in the late 1800s, when linguists wanted to be able to represent the sounds of different languages in a way that would be **consistent** across languages. This was particularly important since it wasn't easy to make recordings of speech (and impossible to make what we'd regard as high-quality recordings): if you wanted to convey what another language or another variety sounded like, you couldn't just play someone a recording.

But today we can very easily make and share extremely high quality recordings, in a way that wasn't possible even 20 years ago (before smartphones became common). So why do we still care about the IPA?

First, let's get some vocabulary out of the way.

- The process of recording speech using a written system like the IPA is called **transcription**. The verb is (to) **transcribe**.

- The symbols of the IPA correspond to **segments** (or sounds). They are **not letters**, even though many symbols of the IPA have the same shape as letters of the Latin alphabet!

- By convention, transcriptions in IPA are enclosed in [square brackets]. When I need to refer to a letter of the English alphabet, I'll enclose it in <angled brackets¿

While high-quality audio recordings are extremely valuable in everyday life and for linguists, there are still contexts where we want to record pronunciations in writing. The first half of this week's topic guide is a good example: it's inconvenient to write "the vowel sound in words like *dog*" when I could instead simply write "[ɑ]"

Even though many languages are written using alphabets—writing systems that aim to represent sounds directly—no alphabet perfectly represents the sounds of a language. Sometimes this is because some *predictable* phonetic information is left out (subtle differences that don't make a contrast between words), or because historical change has altered the pronunciation of the language while the spelling has remained the same.

For English this is particularly true—we have many mismatches between spelling and pronunciation, cases where one symbol could be pronounced several different ways, or where one sound can be spelled using several different symbols (or sequences of symbols). This is for several different historical reasons:

1. English spelling was standardized when printing became common. The standard spelling was based on one variety (spoken in London at the time), and doesn't reflect changes in pronunciation that have taken place since.

    - For example, the "silent <e>" at the end of many words was originally pronounced, but disappeared as a result of a regular sound change in English.
    - "Long" and "short" vowel sounds used to actually be long and short versions of the same sounds, but starting in the 1500s all the "long" vowels systematically traded places. As a result, a "long <i>" and a "short <i>" no longer sound at all like one another.

2. Some spelling in English reflects etymology (the history of a word) rather than its actual pronunciation. This is especially true of words

that came from Latin or Greek, whose standard spellings were often changed to look more like the original Latin or Greek words.

- The word *debt* for example has an extra <b>, which was added to make it look more like Latin *debitum*. This word used to be spelled <dette>, and that's still how we say it.

3. The Latin alphabet wasn't a great fit for the sounds of English in the first place. English has several consonants that didn't exist in Latin (all the ones we spell with two letters, for a start: <th>, <sh>, <ch>), and about twice as many distinct vowel sounds.

    - This is particularly problematic for describing variation in English, because you might have noticed that a lot of the variation we find is precisely in the vowel sounds!

But even if none of these problems existed, and the spelling of English did perfectly reflect pronunciation, we would still want a standard phonetic alphabet so that we could accurately compare sounds **across** languages.

This is what the IPA is designed to do. It is intended to include symbols or **diacritics** (marks that can be added to symbols) to represent all the sounds that are possible in human languages.

The IPA is itself not absolutely perfect—the more a language's sound system differs from the languages most familiar to Western academic linguists, the more use of diacritics and "unusual" symbols is likely to be needed to transcribe a language.

- Until 1978 could only represent 8 tones (high level, low level, high rising, low rising, high falling, low falling, rise-fall, fall-rise)
    - Then adopted Chao's (1930) "tone letters" proposal (description on Wikipedia[1])
- There is ongoing work to **revise** the IPA to make it more useful for a wider variety of languages!

When we transcribe language, our goal is to have a 1:1 correlation between the symbols we use and how they are actually produced.

[1] https://en.wikipedia.org/wiki/Tone_letter

16.1.2 Why do phonetics in LING 100?

Full disclosure: many students do not enjoy learning the details of the IPA! So why do we cover it in LING 100?

For one thing, this is one of the traditional areas of linguistic description and linguistic research. So if a course gives an introduction to linguistics, it should include at least a bit of phonetics.

But also, learning transcription—and more generally, learning about the mechanisms of producing speech—can be very helpful when learning to make sounds in a new language you might be learning. It's also very useful for fields like Speech Language Pathology: in order to help people with speech disorders, we need to know about what would *usually* be going on in articulation in a language.

16.1.3 Okay, but what IS phonetics?

We've already said a bit about what phonetics is in general, but we can say a bit more here.

First of all, there's a major division between **articulatory** phonetics and **acoustic** phonetics.

Articulatory phonetics is the study of speech **production**: for spoken languages, how precisely do we use our lungs, larynx, and mouth to make specific sounds.

Acoustic phonetics is the study of speech **perception**: what are the physical properties of sound waves, and how are these perceived by our ears.

In LING 100 we will focus on **articulatory** phonetics (we won't look at any sound waves). We'll also be focusing on the phonetics of spoken Canadian English, when it comes to transcription.

You do not need to memorize any IPA in LING 100! You will always be able to refer to your notes or to an IPA chart. The goal is that you will be familiar with common symbols in the IPA, and that you would be able to use a chart to figure out how to pronounce new symbols that you encounter.

16.1.4 Anatomy of the Vocal Tract

It is not useful for me to rewrite a description of the anatomy of the vocal tract or the mechanisms of speech production, but just to emphasize: these are things you should know about! They are described in the textbook!

16.2 Articulation: How we produce sounds

The **sounds** of spoken language are produced by manipulating the **articulators** in the vocal tract.

Consonants: Close / restrict air moving through the vocal tract

Vowels: Shape the vocal tract while letting air flow freely

An individual consonant or vowel is refered to as a **segment**.

Refer to the textbook for a review of the articulators involved in the speech sounds of English. Here I simply list them, giving both the **noun** for each articulator and the **adjective** we use to describe sounds made with that articulator.

- In English we tend to use the ordinary English noun for articulators (when there is one), but a Latin-derived adjective.

Articulator ~ Adjective
LIPS ~ labial
TEETH ~ dental
ALVEOLAR RIDGE ~ alveolar
PALATE ~ palatal
(aka "hard palate")
VELUM ~ velar
(aka "soft palate")
GLOTTIS ~ glottal
NOSE ~ nasal

There are two other articulators further back in the mouth/throat that aren't used at all in English:

uvula ~ uvular
(e.g. Inuktitut [q], French <r>)
pharynx ~ pharyngeal
(e.g. Arabic, Hebrew)

If a sound is made using multiple articulators, we can combine the terms:

- LABIODENTAL: articulated using the (lower) lips and (upper) teeth

- LABIOVELAR: articulated simultaneously with the lips and the back of the tongue (against the velum)

And in some cases we can describe a location *relative* to certain articulators:

- INTERDENTAL: *between* the teeth (e.g. sounds we spell in English with <th>)
- POSTALVEOLAR: *behind* the alveolar ridge (e.g. sounds we spell in English with <sh>)

16.3 IPA Symbols for Canadian English

16.3.1 Consonants

Remember that consonants are produced by **blocking** or **obstructing** airflow through the mouth in some way.

We can describe most consonants—including all consonants in English—with **three properties**:

1. **Voicing:** are the vocal folds vibrating during the sound?
2. **Place of articulation:** WHERE is the obstruction made?
3. **Manner of articulation:** what TYPE of obstruction?
    - totally blocked: **stops**
    - a narrow opening, air released noisily: **fricatives**
    - a complex sound that starts with a stop but releases to a fricative with the same place: **affricate**
    - blocked in the mouth but free through the nose: **nasals**
    - blocked for just a fraction of a moment: **flap** (or *trill*, if you vibrate between closed and open)
    - narrowly open, but still more closed than for a vowel: **approximant**
        - open only on the **sides** of the tongue: ***lateral* approximant** ([l])
        - so open we're only a fraction of a step away from being a vowel: **glide** ([w] and [j])

	BILABIAL	LABIO-DENTAL	(INTER) DENTAL	ALVEOLAR	POST-ALVEOLAR	PALATAL	VELAR	GLOTTAL
STOP	p b			t d			k g	ʔ
NASAL	m			n			ŋ	
AFFRICATES					tʃ dʒ			
FRIC.		f v	θ ð	s z	ʃ ʒ			h
FLAP				ɾ				
APPROX.	(w)			ɹ			(w)	
LATERAL APPROX.				l				

Table 16.1: Consonants of Canadian English in IPA

Reference words for all the sounds of Canadian English appear in Section 2.4 of *Essentials of Linguistics*. Section 3.2 gives charts of (nearly) all the symbols we use when transcribing English—though there are a few differences in the set of symbols we'll use in LING 100 (mostly for vowels, described in section 16.3.2).

Minor differences for consonants (more for vowels below):

- included the post-alveolar **affricates** [tʃ] and [dʒ] in the chart
- included the labio-velar **glide** [w] in the chart (like the palatal glide [j], [w] is an approximant)

Reading an IPA chart

IPA charts aren't organized randomly! There is a logic to how the symbols are arranged.

The top row of the chart will always list **places of articulation**.

- These are listed in order from the **front** of the mouth at the ***left***, to the **back** of the mouth at the ***right***.
- Coarticulated consonants are typically listed **twice**, once in each relevant column. The only coarticulated consonant in English is [w], which involves both lip rounding (labial) and constriction of the tongue towards the velum (velar).

Each row gives a different **manner of articulation**.

- The top row always contains **stops**. Each lower row involves a greater degree of opening in the mouth.
- Sometimes affricates aren't included in charts, because they don't technically involve any new symbols! But since they behave as single consonants in English (you can't otherwise have a stop followed by a consonant in English, so no *[pf] or *[ks] at the start of a word), we'll include them in our chart of English consonants.

Pairs of voiced and voiceless sounds are given in the order **voiceless** then **voiced**, here and on the IPA chart. **(Correction: in the original version of this guide, "voiced" and "voiceless" were accidentally reversed on this line.)**

In the rest of this section we'll quickly review the symbols used to transcribe English, focusing on the symbols that **do not** appear in English spelling. We'll go by MANNER OF ARTICULATION.

Quick reminder: IPA symbols appear in [square brackets]. Letters used in English spelling appear in <angled brackets>.

16.3.1.1 Stops

Stops are the most straightfoward! All the IPA symbols for stops use the same letters we use to spell these sounds in English.

The one exception is the **glottal stop** [ʔ]. This is the sound you make in the middle of the word *uh-oh!*

- [ʔ] doesn't occur as a consonant very often in English, but there are some *phonetic processes* that cause other sounds to be pronounced as [ʔ] in some contexts. We'll see more about phonetic processes in Week 5.

Voiceless stops: [p], [t], [k]
Voiced stops: [b], [d], [ɡ]

Note on [ɡ]: Both [ɡ] and [g] are used interchangeably in IPA, but technically [ɡ] is the more "correct" version of this symbol.

16.3.1.2 Nasals

Nasals involve stopping the air in your mouth, but lowering your velum so that air can escape through the nose.

- When you have a cold your nose is blocked, so nasals turn into voiced stops: "nose" suddenly comes out more like "doze".

Nasals are always voiced by default in English (and in most languages), though it's possible for them to be pronounced without voicing in some contexts. For this reason, it's optional to specify voicing when you describe nasals in English.

Nasals have the same place of articulation as stops:

- [m] is a (voiced) **bilabial** nasal (compare [p] and [b])
- [n] is a (voiced) **alveolar** nasal (compare [t] and [d])
- [ŋ] is a (voiced) **velar** nasal (compare [k] and [g])

A note about [ŋ]:

This symbol called **engma** (pronounced [ɛŋmə])

In English engma only occurs at the **end of a syllable** (or word), but in many other languages it can occur in any position [n] or [m] can! If you're trying to learn how to pronounce it in other positions, start by saying a word like "singer" ([sɪŋɚ]), and then try just pronouncing the "nger" part of the word.

16.3.1.3 Fricatives and Affricates

Fricatives are **noisy** sounds that you make by leaving a very narrow and turbulent opening in your mouth, and then forcing air through the gap.

In English we have lots of fricatives! Some are represented by symbols of IPA that are familiar from the English alphabet:

- [f] and [v] are **labiodental**: they involve the lower jaw and upper teeth
- [s] and [z] are **alveolar**: they are pronounced in the same place as [t] and [d]

- [h] is **glottal**: it involves closing your glottis a bit (but not all the way)

In English **spelling** we represent other fricatives using combinations of letters, so we need new symbols to represent them in IPA—fricatives are **simple sounds** (they involve a single static articulation) so they need **single symbols**:

- [θ] and [ð] are **interdental**, pronounced with the tongue between the teeth.
  - These sounds are often spelled <th> in English.
  - [θ] is a **voiceless interdental fricative**, the sound at the start of *thin* or end of *with*. This symbol is called **theta** ([θeɪtə]).
  - [ð] is a **voiced interdental fricative**, the sound at the start of *this* or middle of *weather*. This symbol is called **eth** ([ɛð])
- [ʃ] and [ʒ] are **post-alveolar**, pronounced a bit further back than [s] and [z].
  - These sounds are often spelled <sh> in English.
  - [ʃ] is a **voiceless post-alveolar fricative**, the sound at the start of *shin* or end of *wash*. This symbol is called **esh** ([ɛʃ]).
  - [ʒ] is a **voiced post-alveolar fricative**. It's not very common in English, but you can find it in the middle of the words *leisure* or *pleasure*. This symbol is called **ezh** ([ɛʒ])

It's easier to test voicing with fricatives than with stops, because you can keep making the same shape with your mouth while turning voicing on and off. Try it by saying some of the following:

- ffffffvvvvvvffffffvvvvv
- θθθθθðððððθθθθθððð
- sssssszzzzzzzsssssszzzzzz
- ʃʃʃʃʃʃʃ333333ʃʃʃʃʃʃ33333

For the **voiced** fricatives, you'll be able to feel a buzzing, and if you put your hand on your throat you'll be able to feel your throat vibrating as well!

Affricates are **complex sounds**: they appear in the same places in words that single consonants do, but they involve a **change of articulation** (aka more than one position for your articulators).

We have two affricates in English: [tʃ] and [dʒ]

- Both [tʃ] and [dʒ] are **post-alveolar**, the same place as [ʃ] and [ʒ].
- They start with a stop articulation, and then transition into a fricative.
    - [tʃ] is a **voiceless post-alveolar affricate**, the sound at the start of *chin* or end of *reach*. It's often spelled <ch> in English.
    - [dʒ] is a **voiced post-alveolar affricate**. It's more common than the fricative [ʒ]! You can hear it at the start and end of *judge*, or end of *grudge*.
- Neither of these consonants has special names.

You can have affricates with other places of articulation, English just doesn't happen to.

- German has all three of [pf], [ts], and [kx], for example.

16.3.1.4 Flap

We'll talk more about flap [ɾ] in Week 5. It occurs in the middle of words when you "pronounce a t like a d" in varieties of English in North America.

16.3.1.5 [ɹ]

In IPA, the symbol [r] is used for the **trilled r** found in languages like Spanish.

English <r> doesn't sound like this at all (though the flap mentioned above is a single trill). Instead, our r-sound is an **approximant**: you constrict the vocal tract a bit more than for a vowel, but still leave it pretty open. This is represented in IPA with the symbol [ɹ], which is just an upside-down "r" symbol.

- [ɹ] is a **(voiced) alveolar approximant**. If something is r-like we might also call it *rhotic*.

How exactly do we constrict the mouth for [ɹ]? In fact, there are **two different ways** that English speakers produce this sound: "**retroflex**" and "bunched"

- "retroflex" R is made with the tip of your tongue, which flips back a little bit (languages like Hindi and Mandarin have many other retroflex consonants as well!)
- "bunched" R doesn't involve the tip of your tongue at all. You just tense (or "bunch up") the back of your tongue.

These end up sounding the same, and many speakers use both of them. Because you can only tell the difference by doing an ultrasound of someone's mouth while they're speaking, we'll use the symbol [ɹ] for both of them.

- Try saying the words *red* and *fear*. Can you tell whether you produce a retroflex or a bunched R in these words?

16.3.1.6 Lateral approximant

There is only one lateral sound in English (and many other languages): [l]

This is a **(voiced) (alveolar) lateral approximant**. It is made by touching the tip of your tongue to the alveolar ridge, and leaving one or both sides of the tongue open.

- "lateral approximant" is the manner of articulation. Because all approximants are voiced, and English only has an alveolar lateral, it's optional to list both "voiced" and "alveolar" when describing [l]

Other languages have many more lateral consonants than English does. Salish languages spoken in BC, for example, have lateral stops and fricatives.

16.3.1.7 Glides

Glides are a subtype of approximant: these are the **most vowel-like consonants**.

- [j] is a **(voiced) palatal glide**. It is the only palatal sound in English! It's often spelled with <y> in English, and appears at the start of words like *yes* or *yellow*.
- [w] is a **(voiced) labio-velar glide**. It involves rounding the lips **and** bunching the tongue towards the velum. It's usually spelled with <w>.

A note on <w> vs. <wh>

- English historically had a **voiceless** counterpart of [w]. This sound was spelled <wh>, and appeared in words like *white* and *while*.
- If the words *whine* and *wine*, or *whale* and *wail* sound different to you, then you have this voiceless labiodental glide! Most younger English speakers in Canada don't make this distinction, but it used to be more common.
- The IPA symbol for the voiceless labiovelar consonant is [ʍ], an upside-down [w] (if you ever write this symbol by hand, make sure to distinguish it carefully from [m]).

16.3.2 Vowels

We can describe the vowels of English with **four properties**:

- HEIGHT (high vs. mid vs. low)
    - ignore "close" and "open" in the official IPA chart, we **will not use these terms** in this class
- BACKNESS (front vs. central vs. back)
- TENSENESS (tense vs. lax)
- ROUNDING (unrounded vs. rounded)

The properties of a vowel are referred to as the **vowel quality**.

I strongly recommend watching the video for these sounds, because it's difficult to describe the properties of vowels in text.

At the end of this file, in section **??** there's a **reference chart** with words of English that exemplify all the vowels that contrast in Canadian English.

- Note that the vowel [ɔ] only occurs before [ɹ] for most Canadian English speakers!

Simple vowels are also called **monophthongs**—they have a **steady state** (notice the prefix *mono-* meaning "one").

Diphthongs are vowels that **transition** between two different simple vowel sounds. Like affricates, these are **complex** sounds, and so we represent them with multiple symbols of IPA.

We will depart from the textbook's treatment of English vowels, and in one case from something in the Crash Course video, in a few ways. All

	FRONT	CENTRAL	BACK
HIGH	[i]		[u]
	[ɪ]		[ʊ]
MID	[e]	[ə]/[ʌ]	[o]
	[ɛ]	[ɚ]/[ɝ]	[ɔ]
LOW	[æ]	([a])	[ɑ]

	FRONT	CENTRAL	BACK
HIGH	[ju]		
MID			[ɔɪ]
LOW		[aɪ]/[aʊ]	

Table 16.2: Vowels of Canadian English in IPA

the symbols that require some explanation appear in **bold** in Table 16.7; the explanations appear in the next few sections.

- One of these, our treatment of [a], is a difference in both how we'll transcribe certain words, and how we describe the sound represented by the symbol
- Two are a difference in the description we give the sound represented by a symbol:
  - like the textbook (but unlike Crash Course) we'll call [ɑ] a **back** vowel.
  - like Crash Course (but unlike the textbook) we'll call [ʌ] a **central** vowel.
- One note is just a clarification: the textbook lists [ɜ] as a vowel of English in section 3.4, but (as is clear in section 2.4) this vowel only occurs in Canadian English as an "r-coloured" vowel (see more about this below)

There is also a section with a **note on schwa and unstressed vowels**.

16.3.2.1 ★The vowel [a]: LING 100 vs. Essentials

Essentials of Linguistics treats the vowel [a] unusually in two ways:

- In section 2.4, this vowel is introduced to transcribe the vowel in words like *start* and *far*
- In section 3.2, this vowel is classified as **front**

These are both somewhat unusual decisions, though there are reasons why the textbook author went that way. Let's discuss them one by one, as a chance to talk about how we make decisions about transcribing vowels in English. If you aren't interested in the reasoning, you can just skip down to ***The take-home message*** in both cases.

Why use [a] to transcribe the vowel in *start* or *far*?

For most speakers of English in Canada—and speakers of most **rhotic** varieties of English (the ones that have [ɹ] at the end of syllables)—the vowel in *start* is very similar to the vowel in *father* and *palm*.

- For most Canadian English speakers this is also the vowel in words like *bother* and *dog*, as a result of something called the *father-bother* merger.

However, [ɹ] does tend to affect the vowels it's next to, and in particular it can **front** vowels. So the vowel in *start* might be slightly further forward than the vowel in *father*. This difference is represented in the textbook by transcribing *start* as [staɹt]—but in my opinion this is much too far forward to represent the actual pronunciation of most speakers (with the exception of some speakers of Maritime English).

Aside

If you do think you pronounce the vowel in *start* and the first vowel in *father* a bit differently from each other, and it's bothering you, one possibility is that you have a difference in **rounding**. For some English speakers, including some in Canada, the vowel in *father* is (slightly) **rounded**, while the vowel in *start* is **unrounded**.

The **low back tense rounded** vowel in *father* would be transcribed [ɒ]

father: [fɒðɚ]

The **low back tense unrounded** vowel in *start* would continue to be transcribed [ɑ]

start: [stɑɹt]

We are not going to worry about this distinction in LING 100, but if you can hear this difference in your own speech you're welcome to transcribe it.

The take-home message: Don't use [a] to transcribe the vowel in *start* and *far*, use [ɑ].

Why call [a] front?

The official IPA chart shows [a] as a front vowel, and the textbook follows this representation.

However, the IPA chart for vowels is very narrow at the bottom, and doesn't have a dedicated symbol for a low **central** vowel. Pretty much all linguists would describe [a] as a low central vowel, so that's what we're going to do.

However, most Canadian English speakers don't actually have a vowel [a]! This would be a vowel somewhere between [æ] (as in *bat*) and [ɑ] (as in *bot*).

- The exception is that some speakers do use [a] for some "foreign-a" words! You might be able to tell that you have this vowel if you distinguish the **middle** word in any of the following triples (instead of pronouncing it like either the first word or the third word):

- Nan - naan - non
- rack - Iraq - rock
- lagger - lager - logger

The take-home message:

a is a **low central tense vowel** (not front!)

- in any case, we will not be using [a] to transcribe any simple vowels in Canadian English in LING 100 (though we'll use it as the first part of the diphthongs [aɪ] and [aʊ])

16.3.2.2 ⭐The vowel [ɑ]: LING 100 and Essentials vs. Crash Course

The Crash Course video lists [ɑ] as central, not back. Because vowels are **continuous**, unlike consonants, there's more flexibility in how they're categorized. And because of how our mouths (and the vowel space) are shaped, there's less *room* for low vowels than there is for mid or high vowels—the vowel space **narrows** as you move downwards.

Because many English varieties have **merged** various low-back vowels (as in the *cot-caught* merger), varieties vary in how their remaining low-back vowels are pronounced. Notice, though, that English doesn't have very many central vowels, and we don't have **any** that *contrast* with back vowels.

- In other words, there's no pair of words in English that are distinguished just by the backness of their vowel. There's always some other property, like roundedness, that distinguishes the vowels.

We will follow the textbook, and most descriptions of vowels in English, in treating [ɑ] as a **back vowel**.

16.3.2.3 ⭐The vowel [ʌ]: LING 100 and Crash Course vs. Essentials

The textbook lists [ʌ] as back, not central. Again, this is a case of the textbook strictly following the definitions of symbols given in the official IPA chart. When transcribing English, [ʌ] is used to transcribe a **mid central lax unrounded vowel**.

16.3.2.4 "R-coloured" vowels

In some words where an <r> comes after a vowel, you can't separate out a vowel from the following [ɹ]!

- For example: *bird*, *fur*, *thirsty*, *weather*

This is called an "R-coloured" vowel. This vowel is always a **mid central unrounded lax** vowel.

We use two symbols for "R-coloured" vowels in Canadian English:

- [ɚ]: is the vowel in the second syllable of a word like *weather* or *future*, an unstressed vowel that is "coloured" by r
- [ɝ]: the textbook only shows [ɜ] in the vowel chart in 3.2, but in Canadian English this vowel only occurs when "coloured" by r! This is the stressed counterpart of [ɚ] (or the r-coloured counterpart of [ʌ]), the vowel in a word like *bird* or *learn* or *fur*
    - "Why don't we just put the little r-hook on [ʌ]?" For whatever historical reason, that isn't the symbol that ended up being used for an r-coloured central vowel in English.

16.3.2.5 [ə] and unstressed vowels

The vowel [ə] has a special name: schwa (pronounced [ʃwɑ])

Two generalizations to keep in mind:

- [ə] can never be stressed. We'll cover stress in Week 5, but for now you can just remember: **schwa can never be the only vowel in a word**.
- In English, unstressed vowels are always **reduced**, meaning they only ever sound like [ə] or [ɪ].

16.4 ★Phonetics of Signed Languages

For signed languages we don't have the same distinction between consonants and vowels. Instead we talk about the components of signs—like segments, these are minimal properties that aren't meaningful on their own, but that can distinguish between signs.

The study of these aspects of signs falls within phonetics, even though they don't involve "sound" (which is part of the etymology of the word

	FRONT	CENTRAL	BACK
HIGH	[i]: beat [ɪ]: bit		[ʊ]: book [u]: boot
MID	[e]: bait [ɛ]: bet	[ə]: ab**bot**/[ʌ]: but [ɚ]: Ro**bert**/[ɝ]: bird	[ɔ]: bore [o]: boat
LOW	[æ]: bat	([a])	[ɑ]: bot/bought

Table 16.3: Exemplars for all simple vowels of Canadian English in IPA

phonetics). This is because these play the same role in the **abstract structure** of signed languages that sounds do in spoken languages—by studying sign language phonetics alongside spoken language phonetics, we can tease apart what parts of phonetics have to do with the properties of sounds and human mouths / ears, and what parts have to do with the cognitive system of language.

Most descriptions of signed languages agree on the following components:

- Handshape
- Location
- Movement
- Orientation
- Non-manual markers

If you're interested in seeing more about some of the **phonetic variation** in ASL varieties, check out the video posted as a bonus in Week 3!

16.5 Canadian English IPA Reference

This section contains a reference chart for the symbols of IPA that will be used for English transcription in this class, as well as two charts with reference words for the pronunciation of all IPA vowel symbols as we will use them in transcribing Canadian English.

	FRONT	CENTRAL	BACK
HIGH	[ju]: bute		
MID			[ɔɪ]: boy
LOW		[aɪ]: bide/[aʊ]: bowed	

Table 16.4: Exemplars for all diphthongs of Canadian English in IPA

These charts list the symbols that will be used in LING 100 when transcribing English. When there is a difference from the textbook or from any other assigned material (e.g. *Crash Course Linguistics* videos), treat these charts as correct.

Differences from the textbook are noted and briefly explained here. For more detailed explanation of the reasons for the differences, refer to the Topic Guide from Week 4 in the Winter term.

	BILABIAL	LABIO-DENTAL	(INTER) DENTAL	ALVEOLAR	POST-ALVEOLAR	PALATAL	VELAR	GLOTTAL
STOP	p b			t d			k g	ʔ
AFFRICATES					tʃ dʒ			
FRIC.		f v	θ ð	s z	ʃ ʒ			h
NASAL	m			n			ŋ	
FLAP				ɾ				
APPROX.	(w)			ɹ			(w)	
LATERAL APPROX.				l				

Table 16.5: Consonants of Canadian English in IPA

	FRONT	CENTRAL	BACK
HIGH	[i]		[u]
	[ɪ]		[ʊ]
MID	[e]	[ə]/[ʌ]	[o]
	[ɛ]	[ɚ]/[ɝ]	[ɔ]
LOW	[æ]	([a])	[ɑ]

Table 16.6: Vowels of Canadian English in IPA

	FRONT	CENTRAL	BACK
HIGH	[ju]		
MID			[ɔɪ]
LOW		[aɪ]/[aʊ]	

Table 16.7: Diphthongs of Canadian English in IPA

16.5.1 Notes on Consonants

Compare Sections 2.4 and 3.2 in *Essentials of Linguistics*.
Minor differences from the textbook:

- included the post-alveolar **affricates** [tʃ] and [dʒ]
- included the labio-velar **glide** [w] (like the palatal glide [j], [w] is an approximant).

16.5.2 Notes on Vowels and Diphthongs

Compare Sections 2.4 and 3.2 in *Essentials of Linguistics*.
Differences from the textbook are **bolded** in Table 16.7.
Brief description of differences:

- [a]: is **central**, not front

    - Contra the textbook, the vowel in *start*, *far*, etc. should be transcribed [ɑ].

- [ɚ]: is the vowel in the second syllable of a word like *weather* or *future*, an unstressed vowel that is "coloured" by r
- [ɝ]: the textbook only shows [ɜ] in the vowel chart in 3.2, but in Canadian English this vowel only occurs when "coloured" by r! This is the stressed counterpart of [ɚ] (or the r-coloured counterpart of [ʌ]), the vowel in a word like *bird* or *learn* or *fur*

    - "Why don't we just put the little r-hook on [ʌ]?": For whatever historical reason, that isn't the symbol that ended up being used for an r-coloured central vowel in English.

- [ɒ]: this vowel isn't in the table above, but for your information: this is the **rounded** counterpart of [ɑ]. If you feel like you have a slightly rounded vowel in words like *father*, *bother*, you'd have this vowel—and if the vowel in *start* is **not** similarly rounded, it would be [ɑ].

Chapter 17

Winter Week 5: Phonetic Processes and Transcription

Contents

17.1 Phonetic Processes

So far we've looked at the basic set of sounds used in Canadian English—the **sound inventory**—but we haven't looked in detail at how those sounds affect one another when they occur together in words.

Doing this is important as we start transcribing **whole words**, and even transcribing entire sentences or paragraphs of speech. In LING 100 we'll stop at transcribing words, or maybe short phrases, but an example of a longer transcribed passage appears at the end of this topic guide.

In this section we'll start by looking at the **aspiration of voiceless stops** ([p], [t], and [k]), which occurs in all varieties of English. We start by looking at **monosyllabic words** (words with one syllable), but then we'll see that in **polysyllabic words** (aka multisyllabic words, words with more than one syllable) we need to talk about **stress** to make the right generalization about aspiration. Then we'll see that another process, **flapping**, is also sensitive to the placement of stress. Finally, we'll review several other types of assimilation processes.

17.1.1 Aspiration

Consider the two words *pin* and *spin*. We might transcribe them like this:

- *pin*: [pɪn]
- *spin*: [spɪn]

You might already notice that the [p] sound isn't quite the same in the two words, though.

What's the difference? Even if you can't *hear* a difference, try the following experiment:

1. take a sheet of paper and hold it loosely in front of your mouth
2. say "pin" and "spin", and notice which one causes the paper to move more

   (You can also hold your palm up instead of a piece of paper, and pay attention to the feeling of a puff of air)

You probably noticed that the paper moved much more when you said *pin* than it did when you said *spin*! This is because the [p] in *pin* is **aspirated**: it has a breathy puff of air after the stop releases, before the vowel kicks in.

We transcribe aspiration with a **superscript h**. So a better transcription of the two words would be:

- *pin*: [pʰɪn]
- *spin*: [spɪn]

You'll find the same difference between the [t] in *tall* and *stall*, and between the [k] in *can* and *scan*.

- *tall*: [tʰɑl]
- *stall*: [stɑl]
- *can*: [kʰæn][1]
- *scan*: [skæn][2]

Why is the presence of the [s] relevant? Aspiration in English only applies when a voiceless stop is the **only consonant at the beginning of a syllable**.

Is that the only restriction on aspiration? Consider the following words:

- *terror*, *terrific*
- (to) *record* (a video), (vinyl) *record*
- *appease*, *appetizer*

In each of these pairs, only the *first* one has aspiration, even thought all the words are (at least historically) related to each other!

Here are the full transcriptions of these words:

- *terror*: [ˈtʰɛɹɚ]; *terrific*: [tɛˈɹɪfək] (or possibly [tɛˈɹɪfɪk])
- (to) *record* (a video): [ɹəˈkʰɔɹd]; (vinyl) *record*: [ˈɹɛkɚd]
- *appease*: [əˈpʰɪz], *appetizer*: [ˈæpətaɪzɚ]

In these transcriptions, stress is marked with a raised line (ˈ) before the stressed syllable. As it turns out, voiceless stops are only aspirated in English when they are the only consonant at the beginning of a **stressed** syllable.

When a word only has one syllable, it's automatically the most stressed syllable in the word, but when there are multiple syllables in a word at least one will be **unstressed**.

[1] The noun *can* might be more like [kʰeɪn], for speakers who tend to tense [æ] before [n]. For some people (though not everyone), the modal auxiliary *can* is slightly less likely to have the tensed vowel.

[2] Similarly, this might be closer to [skeɪn] for some speakers.

17.1.2 Stress (vs. Intonation)

What is **stress**? Stress is a type of **suprasegmental** phenomenon—what this means is that it's **above** the level of segments, applying instead to sequences of segments.

More specifically, we calculate stress at the level of the **syllable**.

- **What's a syllable?**

  A syllable is a unit of rhythm in language. Every word has to have at least one syllable in it, but in most languages words can be many syllables long.

  In all languages syllables must contain a **nucleus**, and the usual nucleus is a **vowel**. This nucleus can be preceded by one or more consonants, or followed by one or more consonants.

  In some languages, the restrictions on the consonants in a syllable are very strict. In Mandarin, for example, the only consonants that occur at the ends of syllables are [n] and [ŋ], with the exception of syllables whose vowel is [ɚ] (which arguably end with an R consonant).

  English allows comparatively long sequences of consonants in a syllable. For example, the word *strengths* begins with three consonants and ends with four (the [k] inserted via *epenthesis*, see the textbook): [stɹɛŋkθs]

  Speakers of a language can usually identify the syllables of a word—indeed, many writing systems are **syllabic** (each symbol corresponds to one possible syllable), and many systems of poetry require counting syllables.

  To figure out how many syllables there are in a word, you can usually *tap* them: one tap per syllable.

The stressed syllable in a word is the most **prominent**, or the one that you usually give the most **emphasis** (though stress isn't the same thing as emphasis!).

Every content word has one **main stress** or **primary stress**.[3] Words with three or more syllables can also have syllables with **secondary stress**—in LING 100 we won't worry about distinguishing between primary and secondary stress.

[3] By "content word" I mean nouns, verbs, adjectives, and adverbs. Function words like auxiliaries, determiners, and prepositions can be totally unstressed, though when you say them on their own (in isolation) they have a main stress.

- One way to find the main stress is to see which syllable you emphasize on its own. See the content lecture video on stress for a demonstration of this.

In English, **only stressed syllables can contain the full set of vowels**. Unstressed syllables have a smaller set of vowels in them: [ə] and [ɪ] (and in the textbook [ɨ] for suffixes, though I'll transcribe these with [ɪ] since this is a better match for my speech).

- In unstressed syllables we say that vowels are **reduced** in English. This doesn't necessarily apply in all languages! Indeed, one of the things that English speakers sometimes have difficulty with in other languages is learning **not** to reduce most vowels to schwa.

English stress is only partially predictable: if you haven't heard a word spoken aloud, you might not be sure which syllable bears main stress.

We also have pairs of words that are distinguished by stress. For example, for many speakers the following words differ with stress:[4]

- récord vs. recórd
- pérmit vs. permít
- ímport vs. impórt
- décrease vs. decréase
- présent vs. presént
- áddress vs. addréss

In other languages stress is predictable. For example, in Parisian French (and many other varieties, but not all varieties of French in Canada) stress is **always final**.

In languages with **tone** on syllables, stress is less relevant for the sound system.

- **What about intonation and pitch?**

  When we talk about intonation and pitch, we're talking about the pattern of high and low pitch over a whole phrase or sentence.

[4] Here I've used an accent to mark stress, though in IPA stress in marked with a vertical line: ˈ

Intonation often conveys information about questions vs. statements vs. commands, but it can also convey the speaker's attitude or emotion towards what they're saying.

Intonation isn't random: we can talk about the **tunes** associated with different meanings. See the content lecture video for examples of some of the tunes used in (Canadian) English!

The IPA focuses on segments and words, and so does not include symbols for transcribing intonation. In fact, there's no standardized transcription for intonation across all languages, though there are some developed for individual languages or varieties. We will not transcribe intonation in LING 100.

17.1.3 Vowel reduction

One process that occurs very regularly in all unstressed syllables in English is **vowel reduction**.

In English only stressed syllables can contain the full set of contrastive vowel sounds. (This includes syllables with *secondary stress*.) In all unstressed syllables, the number of possible vowels is reduced to three:

- [ə]: schwa (and its r-coloured counterpart) *only* occurs in unstressed syllables
- [ɪ]: small-caps "I" can occur in unstressed syllables
- *[1]*: barred "I" (a high mid lax unrounded vowel) is used in the textbook to represent the vowel found in affixes like the plural or past tense.

These three vowel sounds are very close together. The schwa is closest to an "uh" sound, the small-caps "I" is the vowel in *bit*, and the barred "I" is somewhere between them.

For our purposes, all three could be used to transcribe a word like *horses* or *wanted*; we won't worry about the distinction between them, though you should try to transcribe whatever is closest to your own pronunciation, or to a recording if relevant:

- [hɔɹsəz]
- [hɔɹsiz]
- [hɔɹsɪz]
- [wɑntəd]

- [wɑntɪd]
- [wɑnt̬id]

17.1.4 Syllabic consonants

Not all unstressed syllables have a full vowel in them!

Say the following words, and then try to transcribe them. Pay attention to the second syllable:

- mantle
- keener
- heroism
- fasten

You might have transcribed these with a schwa in the final syllable:

- mantle [mæntəl]
- baker [beɪkəɹ]
- heroism [heɪɹoʊɪzəm]
- fasten [fæsən]

This is definitely one way that these words get pronounced! But especially in fast speech, it's often the case that there isn't a full vowel in the second syllable—you don't open your mouth for a vowel, not even for a super short vowel like schwa.

In these cases we have a **syllabic consonant**. In English the liquids ([l] and [ɹ]) and the nasals ([m], [n], and [ŋ]) can hold an unstressed syllable by themselves, without any vowel. (In other words, they can act as the *nucleus* of a syllable.)

We mark syllabic consonants with a small vertical line beneath the relevant consonant:

- mantle [mæntl̩]
- baker [beɪkɹ̩]
- heroism [heɪɹoʊɪzm̩]
- fasten [fæsn̩]

Not all languages allow syllabic consonants! For example, compare the English and French pronunciations of the word *table* (if you don't speak French, you can Google "pronounce table French" to get a sound file). In English this word always has two syllables—the second one can be a syllabic [l̩]: [tʰeɪ.bl̩]. But in French this is only ever one syllable: [tabl].

17.1.5 Flapping

Like aspiration and vowel reduction, **flapping** in North American varieties of English is sensitive to stress.

Consider the following words:

- matter
- madder
- heated
- heeded

If we speak very carefully, we can distinguish these words:

- matter [mæ.tər]
- madder [mæ.dər]
- heated [hi.təd]
- heeded [hi.dəd]

But most of the time, these first two and the last two words would be **homophones**—they'd sound identical. In most North American varieties of English this happens due to the alveolar stops [t] and [d] both turning into the **flap** [ɾ] when they occur before an unstressed vowel:

- matter [mæ.tər] → [mæ.ɾr̩]
- madder [mæ.dər] → [mæ.ɾr̩]
- heated [hi.təd] → [hi.ɾəd]
- heeded [hi.dəd] → [hi.ɾəd]

This isn't the only thing that can happen to [t] and [d]—[t] in particular often turns into [ʔ] at the ends of syllables, and especially before [n]! So

17.1.6 Other phonetic processes

For other phonetic processes, see the textbook! These include epenthesis, deletion, cluster simplification, metathesis, the diphthongization of mid vowels, and vowel nasalization.

17.2 Broad vs. Narrow Transcription

When transcribing speech, we can include comparatively more or less detail in our transcription.

For example, when transcribing English I might leave out details like stress, vowel nasalization, and aspiration, because these are relatively predictable in English speech. This would be a **broad transcription**: it gives you the broad strokes of what the speech sounded like.

By contrast, I might be as precise as possible in my transcription, including as much detail as I can detect and the IPA allows me to represent. This would be a **narrow transcription**.

Broad and narrow transcription aren't strictly defined categories, they're opposite ends of a scale: we can in principle transcribe speech at many levels of detail.

For practical purposes, in LING 100 (and other linguistics courses) you'll always be told how much detail to include in your transcriptions, so you won't have to make this decision. But when you see transcriptions, you might notice that they include or leave our different amounts of information!

17.3 Transcription in practice

The lines below are transcribed from an audio file of me reading aloud the first lines of a novel originally published in 1982. The breaks between lines fall in places where I took a breath or paused, for the most part—in one case I used "(.)" to indicate a pause within a line (this is not part of core IPA, but is a standard extension).

See if you can figure out what these lines say before listening to the recording!

[ðə.ɹɛ.gjə.ləˠ.ʔəˠɹ.li.mɔɹ.nɪ.ŋjɛ.ləv.hɔɹəˠ.wəz.ðə.saʊn.dəv.ɑɹ.θəˠ.dɛnt.weɪ.kn̩ʌp]
[ʔən.sʌ.dn̩.li.rɪ.mɛm.bɹɪŋ.wɛɹ.hi.wʌz]
[ʔɪʔ.wə.zn̩t.dʒɪst.ðæt.ðə.kʰeɪv.wəs.kʰold.ʔɪʔ.wə.zn̩t.dʒəs.ðæ.ɾɪʔ.wəz.dæm.pn̩.smɛ.li]
[ɪʔ.wəz.ðət.ðə.kʰeɪv.wə.zn̩.ðə.mɪ.dl̩.vɪz.lɪŋ.tn̩.ən.ðəɹ.wə.zn̩.tə.bʌs.dju.fɾ̩.tʰu.mɪ.ljn̩.jiɹz]
[tʰaɪ.mɪz.ðə.wəˠst.pl̥eɪ.s(.)soʊ.ɾə.spik.tə.gɛʔ.lɑs.tɪm]

[ʔəz.ɑɪ.θɻ̩.dɛnt.kʰʊd.tʰɛs.tɪ.faɪ]
[hæ.vn̩.bn̩.lɑs.tn̩.boʊθ.tʰaɪm.ænd.speɪ.sə.gʊd.diɬ]
[ʔæʔ.list.bin̩.lɑs.tn̩.speɪs.kʰɛp.tʃu.bɪ.zi]

Part VII

Phonology

Chapter 18

Winter Week 6: Phonology

Contents

18.1 From Phonetics to Phonology

Both about **sounds**

Phonetics: describing the sounds that occur in a language
The anatomy and acoustics of speech perception and production
Phonology: the organization of sounds in a language
What patterns do sounds fall into?
How to describe regular changes that sounds undergo?

18.1.1 Differences in Contrast

Given a single language (English):

- some possible sounds aren't there at all: [q] [c]

- of the sounds we do have:
  - some can distinguish words, e.g. [b] vs. [p]
  - ... while others can't, e.g. [p] vs. [p^h]
- In one sense, [b] and [p] and [p^h] are all **different sounds**
- In another sense, [p] and [p^h] are the **same sound** (in English)

Phone vs. **Phoneme**

Phone A **phone** is an acoustic/articulatory sound. [p], [p^h] and [b] are all **phones** that occur in English. [q] and [c] do not occur as phones in English.

Phoneme A **phoneme** is a **contrastive** unit of sound in a language. Changing one phoneme can distinguish two **morphemes** from one another (i.e. create **minimal pairs**). /p/and /b/are both phonemes in English.

What about [p] and [p^h] in English?

- Both ways of pronouncing the same phoneme, /p/

Allophone An **allophone** is a phone (sound) that is a way of pronouncing a phoneme. Some phonemes have a single allophone, while other phonemes have more. Allophones of a single phoneme *do not contrast*—they cannot distinguish two morphemes. [p] and [p^h] are **allophones** of the phoneme /p/

Notation:

- phonemes appear in /slashes/(abstract representation)
- allophones and phones appear in [brackets] (what we actually hear)

Tree notation:
(insert treess)

18.1.2 Minimal Pairs and Contrast

How can we tell if two sounds contrast?

Minimal Pair A **minimal pair** is a pair of words (or morphemes) that are distinguished by a change in a single segment (sound). The contrast in *meaning* can be attributed to the contrast between those *sounds*. If two sounds contrast, they correspond to different **phonemes**.

While we didn't call them this at the time, we saw minimal pairs in phonetics!

e.g.

- *beet* ([bit]) vs. *boat* ([boʊt])
    - minimal pair for [i] vs [oʊ]
- *pin* ([pʰɪn]) vs. *bin* ([bɪn])
    - minimal pair for [p] vs. [b]

18.2 ⭐Near Minimal Pairs

If we can't find a *perfect* minimal pair, we sometimes rely on *near* minimal pairs.

These are words where two sounds occur in basically the same environment, but not exactly.

For example, there are almost no minimal pairs for /Z/and /S/in English! But there are some *near* minimal pairs.

For example:

- *treasure* [tɹɛʒɚ] vs. *pressure* [pɹɛʃɚ]

In these words [Z] and [S] occur in almost, but not quite, the same environment. They follow and precede the same sounds, but the initial consonant cluster is different in each word—though both clusters involve a voiceless stop followed by [r].

The only true minimal pairs for /Z/and /S/involve slightly marginal vocabulary:

- *measure* [mɛʒɚ] vs. *mesher* [mɛʃɚ]

- "mesher" = "a person/thing that makes things mesh"

- *rouge* [ɹuʒ] vs. *ruche* [ɹuʃ]
  - both borrowed from French: "rouge" = "red makeup, usually applied to the cheeks", "ruche" = "in fashion, a gathered ruffle or pleat"

English speakers have no trouble distinguishing these pairs of words, which helps give evidence that /Z/and /S/**contrast** in English, in other words that they are separate **phonemes**.

We always rely on true minimal pairs to establish that two sounds are phonemes, if we possibly can. We consider near minimal pairs only if there are no true minimal pairs, and in that case we'd also want other reasons to think that the sounds contrast.

- For example, we'd want to make sure that we can't make any reasonable generalization about where the two sounds occur.
- We might also rely on a near minimal pair for, say, /k/vs. /g/if we already had true minimal pairs for /p/vs. /b/and /t/vs. /d/—so if we already had evidence that voiced and voiceless stops contrast in the language.

18.3 Crosslinguistic Variation

Why do we keep specifying "in English"?

The same **sounds** (phones) can occur in different languages, but with a different set of contrasts—therefore a different number of phonemes.

18.3.1 Example 1: Aspirated Stops in English vs. Hindi

Aspiration in English:

- [p^{h}it] vs. [bit] (*[pit] isn't a possible word)
- [spik] (but neither *[sp^{h}ik] nor *[sbik] are possible words)

Aspiration in Hindi:

- [pəl] "moment"

- [bəl] "strength"
- [pʰəl] "fruit"

These three bilabial stop **sounds** (phones) occur in both English and Hindi: [b], [p], and [pʰ]

But while in English these sounds represent only two bilabial stop **phonemes**, in Hindi all three of them contrast:

English: 2 phonemes (Trees for phoneme structures)

Hindi: 3 phonemes

Aside: Hindi actually has a fourth bilabial stop phoneme, [bʰ], but since this sound doesn't occur at all in English it's not relevant to the point we're making here.

18.3.2 Example 2: [l] vs. [ɹ] / [ɾ] in English vs. Korean

Now consider the distribution of the **phones** [l] and [ɾ] in Korean:

(Insert table)

Here the first column shows the root as a free morpheme, and the second column shows the same root with the nominative suffix *-i*.

In these pairs we can see that it's totally predictable when you see [l] and when you see [ɾ]!

- [l] occurs at the ends of words
- [ɾ] occurs in the middle of words /before a vowel

Because these sounds alternate in the realization of specific morphemes, and their distribution is **predictable**, we can conclude that they are **allophones of a single phoneme**.

Important Note: Even though [ɾ] is an allophone of /t/and /d/in English, in Korean the flap is an R sound.

For whatever reason, R sounds show a lot of **phonetic** variation across languages!

- NA English R: [ɹ] (alveolar approximant)
- Spanish R: [ɾ] (alveolar trill)
- Korean R: [ɾ]
- French R: [ʁ] or [ʀ] (uvular fricative or trill), but historically [r] (still found in some varieties!)

What makes these all R sounds is that **phonologically** they act as sonorants that have a similar distribution to [l]. This is indirectly represented in the symbols chosen to represent these sounds in the IPA: the shapes are all related to the letters and .

So when we look at the alternation between [l] and [ɾ] in Korean, we won't compare this to [l] and [ɾ] in English, but instead to [l] and [ɹ]

The distribution between [l] and [ɹ] in English is very different! In English we have many **minimal pairs** distinguished by these two sounds.

- *leaf* [lif] vs. *reef* [ɹif]
- *flack* [flæk] vs. *frack* [fɹæk]
- *feel* [fil] vs. *fear* [fiɹ]

English: 2 phonemes
(Tree)
Korean: 1 phoneme
(Tree)

18.4 Complementary Distribution vs. Free Variation

When two sounds *contrast*—when they can distinguish at least one **minimal pair** in a language—we know that they correspond to separate phonemes.

When two sounds **don't** contrast, though, there are two types of distribution they can have: predictable (**complementary distribution**) or free/ random (**free variation**)

Consider the relationship between various allophones of [k] in English:

Some of these allophones are **predictable**: [k] and [k^{h}] each occurs in a specific context at the start of a word, and we always know exactly when to expect each one.

But others are **unpredictable**: [k], [k˺] and [k'] all occur at the ends of words in Canadian English (the second two are **unreleased k** and **ejectivized k** respectively.) For any given word, all three are possible pronunciations. This is what it means for sounds to be in **free variation.**

Definitions:

Complementary Distribution Allophones are in complementary distribution if they never occur in the same context—the distributions are "complementary" in the sense that they do not overlap.

- If sounds are in complementary distribution we can always **predict** which one will occur.
- *Example:* [k] and [k^{h}] are in complementary distribution in English.

Free variation Allophones are in free variation with each other if, in a given environment, any can freely occur.

- *Example:* [k], [k'] and [k˺] are in free variation word-finally in English.

In phonology we are usually interested in sounds that are in **complementary distribution**, because we'll be focused on *figuring out* the patterns that make them predictable. But it's important to remember that the possibility of free variation also exists!

Chapter 19

Winter Week 7: Phonological Features

Contents

19.1 Features

This week we're introducing the concept of **phonological features**.

The idea of **features** is that they describe the properties of any individual segment.

In some ways these are just a way of restating our phonetic descriptions of segments. So while in phonetics we talked about voiced and voiceless segments, or about nasal and non-nasal segments, when we move to features we'll talk about segments that are [+voice] or [–voice], or ones that are [+nasal] and [–nasal].

But features aren't just restatements of phonetic descriptions. The list of features we propose is a **theory** of which properties are potentially contrastive in spoken languages in general, or in a specific language!

Features also give us a **controlled vocabulary** to talk about distinctions between segments—part of what that controlled vocabulary does is limit the types of groups of sounds we can group together, in a systematic way.

As long as I'm just using words, or just using IPA symbols, I can describe various groups of sounds. Some of these "make sense" as groups of sounds that might pattern together in phonetics or phonology! For example, for English:

- nasal consonants /[m], [n], [ŋ]
- front vowels /[i], [ɪ], [e], [ɛ], [æ]
- voiced fricatives /[v], [ð], [z], [ʒ]

But there are other groups that are just as easy to describe in words, but that **don't** make sense as groups of sounds that might pattern together in grammar! For example:

- consonants whose IPA symbols are not letters of the Latin alphabet
- 3 most frequent sounds

And then there are groups of sounds that seem like they could make sense, but that it turns out languages don't actually group together in grammar!

- non-labial consonants
- low and high vowels
- labiodental and interdental consonants

Our goal with a theory of features is to limit ourselves to describing only the groups of sounds that actually pattern together in languages. In LING 100 we'll adopt a fairly standard set of features used in phonology.

Features come in two types:

binary features Also sometimes called "bivalent features". These features have two possible values: + and –. Most features are of this type.

- For example: [±voice], [±sonorant], [±high]. For a feature [±*feature*] segment is specified as either [+*feature*] or [–*feature*].

monovalent features These features have a single value. These are only used for **major place features**: [LABIAL], [CORONAL], and [DORSAL]. These do **not** have plusses and minuses.

For this unit, I strongly recommend watching the video lectures for the discussion of which segments have which features. The textbook also gives a **chart** of which segments are specified for which features. In the rest of the topic guide I'll simply go through the major feature types, and describe what the features describe (and any tricky points).

19.1.1 Major Class Features

The major class features divide sounds into the primary "types" of sounds.

[±syllabic**]** This feature divides all the **vowels** from all the **consonants**. Can be thought of as "is able to be the nucleus of a syllable."

- Consonants are all *underlyingly* [–syllabic], but nasals and liquids in English can become [+syllabic] in some environments, which is when they become syllabic.

[±consonantal**]** Despite its name, this feature is not "is a consonant"! It divides the "core" consonants from the glottal consonants and the glides: glottal stop, [h], [j] and [w] are all consonants, but they have the [–consonantal] feature.

[±sonorant**]** This feature distinguishes stops, fricatives, and affricates (the obstruents) from all other segment types. Stops, fricatives, and affricates are [–sonorant]; everything else (including all vowels) is [+sonorant]

19.1.2 Manner Features

The manner features describe the type of obstruction in the vocal tract:

[±voice**]** Are the vocal folds vibrating or not? (Note: there is no feature "voiceless"!)

[±nasal**]** Is the velum lowered to let air out through the nose? (All nasal consonants and nasalized vowels are [+nasal]; everything else is [–nasal])

[±continuant**]** Does air flow *continuously* through the mouth? This feature distinguishes stops (including nasal stops) and affricates, which are [−continuant], from all other sounds (including vowels), which are [+continuant].

[±lateral**]** Is the side of the tongue open? Only lateral consonants—in English only [l]—are [+lateral]

19.1.3 Major Place Features

There are only three major place features: [LABIAL], [CORONAL], and [DORSAL]. These describe what the **lower** articulator is for a segment:

[LABIAL] made with the lower lip (labial and labiodental consonants, rounded vowels and glides)

[CORONAL] made with the tongue tip or blade (interdental, alveolar, and post-alveolar consonants)

[DORSAL] made with the tongue root (velar consonants, all vowels and glides)

These are always written in capital or small-caps letters. They have no "+" or "−" value.

Important: There are no features like "alveolar" or "interdental"!

19.1.4 (Minor) Place Features

These are usually just called "place features". They are often treated as **dependent** on the major place features.

For example: the simplest (minor) place feature is [±round]

[±round**]** Are the lips rounded ([+round]) or not ([−round])?

You can only be [±round] if the lips are involved! So [±round] is dependent on [LABIAL]—you can only have a value for [±round] if you have the major place feature [LABIAL].

[±anterior] and [±strident] are dependent on [CORONAL], and we use them particularly to distinguish the different types of coronal fricatives: interdental, alveolar, and post-alveolar.

[±anterior**]** Made towards the front of the coronal region, or to the back? Post-alveolar sounds are [−anterior]; everything else with [CORONAL] is [+anterior]

[±strident**]** Strident sounds are **noisy**—they have a lot of acoustic energy. The sibilants ([s], [z], [ʃ], [ʒ]) are [+strident]; all other [CORONAL] segments are [−strident].

Finally, [DORSAL] segments can be specified for how high and how far forward/back the tongue body is. These are our vowel place features:

[±high**]** Is the tongue body high or not?

[±low**]** Is the tongue body low or not?

- We need both [±high] and [±low] to get the **three heights** of vowels in English. High vowels are [+high, −low], low vowels are [−high, +low], and **mid vowels are [**−high, −low**].**[1]

[±back**]** Is the tongue body back or not? (Note: we don't need a feature [±front] for English, because the difference between back vowels and central vowels can always be made with [±round]!)

[±tense**]** Is the tongue root tensed slightly, bringing it very slightly further towards the roof of the mouth? (Note: no feature [±lax]!)

- This won't come up much in LING 100, but dorsal consonants (=velars) are also [+high] and [+back]!
- The distinction between [j] and [w] (the glide equivalents of [i] and [u]) is also [±back]

19.2 Natural Classes

We use features to describe **natural classes of sounds**.

A natural class is the set of **all** the sounds in a language that share some set of features.

So the natural class described by [+voice] will be all the voiced sounds in that language—vowels and consonants!

[1] It's physically impossible to be [+high, +low], so there's no set of vowels with that feature combination.

The natural class described by [+voice, –syllabic] will be just the voiced consonants.

The natural class described by [+voice, +consonantal] will be the voiced consonants **except** for the glides [w] and [j].

The natural class described by [+voice, +consonantal, LABIAL] will be **just** the voiced labial consonants: [m], [v], and [b].

The set of natural classes in a language depends on its sound inventory!

- In English, for example, we don't have any velar fricatives or approximates, so the natural class [DORSAL, –sonorant] consists only of the stops [k] and [g] ([–sonorant] excludes the glides [w] and [j], all of the vowels, and the nasal [ŋ]).
- In German, however, there are velar fricatives! So in German [DORSAL, –sonorant] would pick out [k], [g], [x] and [ɣ] (the voiceless and voiced velar fricatives). To pick out just [k] and [g] in German, we'd have to add another feature: [DORSAL, –sonorant, –continuant].

We will practice identifying natural classes in Weeks 7 and 8.

Chapter 20

Winter Week 8: Phonological Rules

Contents

20.1 What ARE Phonological Rules?

What is a phonological **rule**? A phonological rule expresses a generalization about the sound pattern in a language. These generalizations reflect two types of facts:

- *Alternations* how a morpheme is pronounced in different contexts—that is, how it might change depending on the sounds of other morphemes in the same word.
- The *distribution* of sounds, independent of alternations—for example, the observation that aspirated and unaspirated stops occur in different contexts in English.

We write phonological rules when alternations /distributions are **predictable**. By proposing a rule, we're making a claim about what speakers *know* about their language, and about the*type* of knowledge they have. More precisely, we're proposing that instead of memorizing phonetic details for each individual word, there are certain patterns of sounds that can be abstracted across *all* words in a language.

When we propose a rule, we're also making a prediction about how *new* words in the language will behave.

We've seen a number of predictable phonetic processes in English that we can now think of as rules:

- Aspiration of voiceless stops: voiceless stops become aspirated when they occur at the beginning of a stressed syllable.
- Liquid devoicing: liquids (/l/, /ɹ/) become devoiced when they occur after a voiceless stop.
- Flapping: alveolar stops (/t/, /d/) become flap when they occur between two vowels, and the second vowel is unstressed.
- Canadian Raising: the low initial part of the diphthongs /aɪ/and /aʊ/ raises to a mid central vowel ([ɐ]) when the diphthong occurs before a voiceless segment.

We can also express generalizations in other languages in terms of rule notation—once we identify **allophones in complementary distribution**, we can use a **rule** to express when the phoneme turns into the predictable allophone.

Remember that we previously saw the relationship between [l] and [ɾ] in **Korean** (where [ɾ] is the R-like sound in Korean). We saw that these two sounds are **allophones of a single phoneme**: roots that end in [l] when they occur by themselves end with [ɾ] when you add a vowel-initial suffix:

Citation	Nominative	
[pul]	[puɾi]	"fire"
[mal]	[maɾi]	"language"
[tal]	[taɾi]	"moon"
[khal]	[khaɾi]	"knife"
[pal]	[paɾi]	"foot"
[sal]	[saɾi]	"flesh"

[multok]	"water jug"
[ilkop]	"seven"

It turns out that the generalization is slightly more complex than this! While [l] occurs at the ends of words, it also occurs in the middle of words *before consonants*:

And while [ɾ] doesn't occur at the beginning of words in the native Korean vocabulary, it does occur at the beginning of some loanwords, including loans from English:

[ɾatio]	"radio"
[ɾupi]	"ruby"

It turns out that we can state this generalization very neatly in terms of **syllables**: [l] occurs at the **end** of syllables (word finally and before a consonant in the middle of a word), while [ɾ] occurs at the **beginning** of syllables (word initially or between two vowels).

Finally, there are two generalizations involving [n] that we can see in **Anishinaabemowin**. The first-person singular prefix in Anishinaabemowin is usually pronounced *nin-*:

[nin-dagoʃin]	"I arrive"
[nin-dʒiːmeː]	"I canoe"
[nin-zagaswaː]	"I smoke"
[nin-ʒakizi]	"I am damp"
[nin-gawiseː]	"I fall over"

But the prefix becomes *nim-* before some verbs, and *ni-* before others:

[nim-ba:p]	"I laugh"
[nim-bimose:]	"I walk along"
[ni-w:sin]	"I eat"
[ni-minikwe:]	"I drink"
[ni-niba:]	"I sleep"

Do people who speak Anishinaabemowin just need to memorize which verbs take which prefix? **No.** There's a natural sound-based explanation:

- [n] becomes the labial nasal [m] before the labial stop [b] (voicing assimilation)
- [n] deletes before nasals and glides (other *sonorant* consonants)

So far we've looked at the idea behind rules, and why we bother thinking about them at all in linguistics.

Next we'll look at how you **state** rules in formal notation.

20.2 Details of Rule Notation

Just like with feature notation, we have a formal way of stating rules so that they're clear and unambiguous.

The general format for rules is: **/A/→ [B] /X _ Y**

- A is the thing that changes
- The arrow (→) can be thought of as saying "turns into" or "becomes"
- B is what A turns into
- the backslash (/) can be read as "in the environment of"
- X is what comes before the change (to its left)
- Y is what comes after the change
- the underscore indicates the place where the changing sound (A→B) occurs

Another way of thinking about this rule notation is that it does a find-and-replace: it finds X**A**Y and replaces it with X**B**Y.

We don't always need to specify both X and Y—sometimes all that matters is what comes before a sound or what comes after it!

Aside: And sometimes we don't need any environment at all! Consider the fact that we've said that the **tense mid vowels** in English (/e/and /o/) are **always** realized as diphthongs. We can state this as two **rules** that have no environment: they apply to every single example of these two phonemes:

/e/→ [eɪ]

/o/→ [oʊ]

(We could actually state this as a single rule, but it would require fancier notation than we will be learning in LING 100, to incorporate *variables*. Basically we'd say that [+syllabic, −high, −low, +tense] segments turn into diphthongs whose second part has the same value for backness and rounding, but [+high, −tense] instead.)

When we write rules we want to identify the **thing that changes** and the **environment in which the change occurs** in terms of either a single segment or as a natural class. We also want to specify the **change** as minimally as possible—if we included every single feature in every single rule, the rules would get unwieldy! We'll see examples of this below.

20.2.1 List of Abbreviations

There are a number of standard abbreviations we use when writing rules:

- X__ : "After X"
    - m__ "after an [m]"

- [+consonantal] _ "after a [+consonantal] segment"

- _ Y : "Before Y"
  - _m "before an [m]
  - _[+syllabic] "before any [+syllabic] segment"

- # : any word boundary
  - #_ "At the beginning of a word"
  - _# "At the end of a word"

- $_{\text{syllable}}$[: a syllable boundary
  - $_{\text{syllable}}$[_ "At the beginning of a syllable"
  -]$_{\text{syllable}}$ "At the end of a syllable"

- ∅ : nothing (used to write insertion and deletion rules)
  - A → ∅ "A is deleted" (aka "A turns into nothing")
  - ∅ → B "B is inserted" (aka "nothing turns into B")

- V : any vowel (= any [+syllabic] segment)

- C : any consonant (= any [-syllabic] segment)

20.2.2 Examples

In this section we'll see generalizations stated above (some from previous weeks) in rule notation, using features to express natural classes.

20.3 Flapping (English)

Flapping alveolar stops (/t/, /d/) become flap when they occur between two vowels, and the second vowel is unstressed.

- What changes? (A) : /t, d/

- What do they turn into? (B) : [ɾ]

- Where? : V _ $V_{[-\text{stress}]}$

Putting this together:

- /t,d/$\rightarrow$ [ɾ] /V -- $V_{[-stress]}$

But we're still just *listing* /t/and /d/here—it's not an accident that these pattern together! This rule doesn't apply to /t/and /d/randomly, it applies to them because they're a **natural class**, the class of alveolar stops in English.

We can pick them out more precisely using features:

- [CORONAL,–sonorant,–continuant,+anterior] $\rightarrow$ [ɾ] /V -- $V_{[-stress]}$

(We could also describe flap using features, and that would be perfectly correct, but this is usually overkill if you're dealing with a single segment—easier to just use the IPA symbol, which can be thought of as shorthand for the relevant list of features.)

When we write features in a single row, we separate them with commas inside a single set of brackets; when we write them vertically in a list we should use tall brackets (see the video lecture for examples).

20.4 Aspiration (English)

Aspiration of voiceless stops voiceless stops become aspirated when they occur at the beginning of a stressed syllable (=a syllable whose vowel is [+stress]).

- What changes? (A) : /p,t,k/
- What do they turn into? (B) : [p^h,t^h,k^h]
- Where? : $_{syllable}$[-- $V_{[+stress]}$

Putting this together:

- /p,t,k/$\rightarrow$ [p^h, t^h, k^h] /$_{syllable}$[-- $V_{[+stress]}$

But again, we want to be clear that [p,t,k] isn't a random set of sounds! In English this is the complete list of voiceless stops. We can identify this natural class using features, and identify the change as becoming [+spread glottis] (the feature used for aspiration in phonology):

- [–continuant, –delayed release, –voice] $\rightarrow$ [+spread glottis] /$_{syllable}$[-- $V_{[+stress]}$

20.5 Liquid Devoicing (English)

Liquid devoicing liquids (/l/, /ɹ/) become devoiced when they occur after a voiceless stop.

- What changes? (A) : /l//ɹ/
- What do they turn into? (B) : [l̥] [ɹ̥]
- Where? : [p,t,k] __

Putting this together:

- /l/, /ɹ/→ [l̥] , [ɹ̥] /[p,t,k] __

Again, we are missing the natural classes! So we need to use features:

- [+sonorant,+consonantal,–nasal] → [–voice] /[–sonorant,–continuant,–voice] __

20.6 Korean [l] [r]

Korean liquid alternation The phoneme /l/is realized as [ɾ] when it is at the beginning of a syllable.

- What changes? (A) : /l/
- What does it turn into? (B) : [ɾ]
- Where? : $_{\text{syllable}}$[__

Putting this together:

- /l/→ [ɾ] /$_{\text{syllable}}$[__

This time the rule only affects one segment, and the environment doesn't involve any natural classes, so there's no need to write it using features—though we could if we wanted to!

20.7 Anishinaabemowin Nasal Alternation

Anishinaabemowin Nasal Deletion The alveolar nasal [n] deletes before a sonorant consonant.

- What changes? (A) : /n/
- What des it turn into? (B) : ∅
- Where? : _ [+sonorant,–syllabic]

Putting this together:

- /n/ → ∅ / _ [+sonorant, –syllabic]

Anishinaabemowin Nasal Assimilation The alveolar nasal [n] becomes the labial nasal [m] before the labial stop [b].

- What changes? (A) : /n/
- What des it turn into? (B) : [m]
- Where? : _ [b]

Putting this together:

- /n/ → [m] / _ [b]

This time we still don't *have* to write this using features, but using features can help illustrate what's **natural** about this rule:

[CORONAL,+nasal,–syllabic] → [LABIAL] / _ [LABIAL,+consonantal]

Using the features helps highlight that this is an **assimilation** rule: [n] is changing into [m] to be *more like* the following [b]. (It's not that this rule doesn't happen before [p], just that Anishinaabemowin doesn't contrast [b] and [p] word-initially.)

20.8 ★Derivations and Rule Ordering

Before we said that we state generalizations using rules to be **precise** about the patterns in a language.

One place where this becomes important is when rules potentially **interact**.

Two rules that interact very famously are **flapping** and **Canadian Raising**. Before we get to their interaction, let's quickly review Canadian Raising.

20.8.1 Canadian Raising

Canadian Raising is a very regular process—a rule—that applies in many varieties of Canadian English, as well as in some spoken in parts of the US.

Canadian Raising the low initial part of the diphthongs /aI/and /aU/ raises to a mid central vowel ([ʌ]) when the diphthong occurs before a voiceless segment.

The regular (upraised) versions of the diphthongs appear in words like:

- [aɪ]
  - *eyes* [aɪz]
  - *slide* [slaɪd]
  - *live* [laɪv]
  - *dime* [daɪm]
  - *ride* [ɹaɪd]
- [aʊ]
  - *blouse* [blaʊz]
  - *loud* [laʊd]
  - *down* [daʊn]
  - *owl* [aʊl]

The raised versions of the diphthongs appear in words with voiceless consonants after the diphthong:

- [ʌɪ]
  - *ice* [ʌɪz]
  - *slight* [slʌɪt]
  - *life* [lʌɪf]
  - *bike* [bʌɪk]
  - *write* [ɹʌɪt]
- [ʌʊ]

- *mouse* [mʌʊs]
- *out* [ʌʊt]
- *south* [sʌʊθ]
- *flout* [flʌʊt] (as in a maxim)

This rule is a bit tricky to state using our current tools, but we'll slightly cheat and tread diphthongs as just sequences of two vowels. So we'll say that /a/turns into [ʌ] when it's followed by a high lax vowel and then a voiceless consonant:

- /a/→ [ʌ] /__ [+syllabic, +high, –tense] C$[–voice]$

20.8.2 Canadian Raising and Flapping

Some of the words where Canadian Raising applies end in [t], and some of the words where it doesn't apply end in [d].

- If we add unstressed suffixes to these words, these alveolar stops will all turn into [ɾ].
- Flap is **voiced**, so we might expect Canadian Raising **not** to happen.

What actually happens is that if Canadian raising applies in the unsuffixed form of the word, it still applies when we add the suffix:

slide	[slaɪd]	*sliding*	[slaɪɾɪŋ]	*loud*	[laʊd]	*louder*	[laʊɾɚ]
slight	[slʌɪt]	*slighting*	[slʌɪɾɪŋ]	*flout*	[flʌʊt]	*flouter*	[flʌʊɾɚ]

In other words, Canadian Raising is sensitive not to how the sound after it is actually *pronounced*, but to whether it *started out* voiced or voiceless!

We can account for this if Canadian Raising and Flapping apply in a specific *order*—in other words, Canadian Raising has to apply *first*, before Flapping gets a chance to neutralize the difference between /t/and /d/.

If we applied the rules in the other order, we'd get the wrong surface forms! Or rather, we would incorrectly predict that Canadian Raising would fail to apply in words like *flouting* (and *writer*, *lighter*, *doubtable*, etc.)

If the rules applied in this order, then pairs like *writer* and *rider* should be homophones—but in fact for speakers of Canadian English these words sound quite different, because one has the unraised diphthong [aɪ] (*rider* [ɹaɪdɚ]) and the other has the raised diphthong [ʌɪ] (*writer* [ɹaɪɾɚ]).

Underlying Representations:	*loud* /laʊd/	*louder* /laʊd+ɚ/	*flout* /flaʊt/	*flouting* /flaʊt+ɪŋ/
1. Canadian Raising	—	—	flʌʊt	flʌʊtɪŋ
2. Flapping	—	laʊɾɚ	—	flʌʊɾɪŋ
Surface Forms:	[laʊd]	[laʊɾɚ]	[flʌʊt]	[flʌʊɾɪŋ]

Underlying Representations:	*loud* /laʊd/	*louder* /laʊd+ɚ/	*flout* /flaʊt/	*flouting* /flaʊt+ɪŋ/
1. Flapping	—	laʊɾɚ	—	flʌʊɾɪŋ
2. Canadian Raising	—	—	flʌʊt	🚨—🚨
Surface Forms:	[laʊd]	[laʊɾɚ]	[flʌʊt]	*[flaʊɾɪŋ]

20.9 ⭐Steps for Solving a Phonology Problem

If you're given a phonology problem with data from another language, how do you go about solving it?

1. Locate the sounds (it can be helpful to highlight them in different colours)
2. Look for minimal pairs
    - If there's a minimal pair, the sounds must belong to separate phonemes. You're done!
3. If there are no minimal pairs, list the environments where each sound occurs.
    - If they occur in the same environment, they're in free variation
    - If they occur in different environments, you can write a rule.
4. Identify the pattern (this is usually the hardest part!)
5. Write the rule (using natural classes)

Part VIII

Acquisition and Policy

Chapter 21

Winter Week 9: Acquisition of Phonology

Contents

21.1 Language Acquisition: Overview

Something amazing, that we might not pay much attention to because it's so common, is **how good** human infants are at learning a language! Babies aren't very good at many things, but at a time when they're still (for example) stuffing everything they encounter into their mouths, and often before they have learned to walk, babies have already figured out a lot about whatever language they've been exposed to!

What makes this even more impressive is that nobody has to **teach** a baby to speak. As long as a human infant is exposed to some language, they

will figure out its grammatical properties, and start speaking that language on about the same schedule, no matter the language and no matter where in the world they are. Children start babbling in their first year of life, start putting sentences together by age 2, and are usually more or less adult-like in their grammar by around age 8.

Put another way: humans are **made** to speak, and human infants automatically figure out the grammar of whatever language or languages they're exposed to, as part of their normal cognitive development!

For this reason, in linguistics we usually avoid talking about children *"learning"* languages, and instead talk about **language acquisition**. Human infants and young children just pick up (*acquire*) whatever language is around them!

This brings us back to something we started the year with back in September: the idea that humans are **specialized for language**. No matter how smart animals are, they aren't able to learn the grammatical structure underlying human languages. Animals can learn *symbols*, including arbitrary associations between spoken words and meanings (your dog might know what the word *walk* means, for example!), but even close evolutionary relatives of humans like the great apes, can't do what human children do automatically and effortlessly.

One of the biggest debates in the field of language acquisition is *how* specialized the human mind is for language.

- Some argue that language acquisition arises from the combination of cognitive abilities that are independent of language, perhaps combined with social factors that relate to our desire to understand and interact with one another.

- The alternative **nativist** perspective argues that there are at least some aspects of language acquisition that rely on language-specific principles. The argument for this position is often specific to syntax and semantics—when we look at what children actually *do* there are some errors that we never find, even when the language that children hear doesn't rule out those errors!

Because much of the debate about linguistic nativism relates to syntax, we'll return to this topic next week, when we look at the acquisition of morphology, syntax, and semantics. The formal approach to morphology, syntax, and phonology that we've covered in this course, however, is one that assumes that some form of nativism is correct—though one of the big

questions in linguistics is what *exactly* is included in this language-specific system that human minds start out with.

When we talk about children acquiring their first language or languages, we call this **first language acquisition** or **L1 acquisition**, regardless of whether a child is acquiring one language or two or three (or even more!).

- People sometimes worry about "confusing" children by exposing them to more than one language, but in fact children do not have any difficulty acquiring more than one language at once. Some people have argued that there are cognitive benefits to being fluent in more than one language, though the evidence on this is ultimately a bit mixed. What is *certain* is that there's no cognitive *dis*advantage to speaking more than one language.
- In fact, since children are often better at acquiring multiple languages than adults are, it's probably best to expose children to as many languages as is practical!
- However, it's definitely the case that children need a certain *amount* of exposure to a language to acquire it. It's not enough to watch television in another language! A child can acquire a language that's spoken to them consistently by a single caregiver, but their vocabulary and sociolinguistic control of different registers may be limited unless they're also exposed to other people interacting in that language, and possibly being able to interact with peers in the language.

Regardless of how we explain child language acquisition, there are some general facts that all approaches to language acquisition must be able to account for.

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1. **Normal language acquisition depends on exposure to language during a *critical period* early in life**

In the absence of cognitive deficits that affect language, all humans who are exposed to language will acquire a complete grammatical system. And deficits that affect other cognitive abilities don't necessarily affect language! Someone can have cognitive impairments that prevent them from being able to live alone as an adult, but nonetheless show no difference in their overall linguistic system.

However, if a child is not exposed to language early in life, they will not necessarily acquire a complete grammatical system, even if they are given access to language later on.

- Evidence for this has come from some cases of very severe child abuse, where children were totally isolated and not spoken to in early life.
- But evidence also comes from the experience of many **deaf** children born to hearing families. Deaf children who are not given access to signed language early in life are denied linguistic input at a critical stage in their cognitive development.
- Deaf children who are not given a chance to acquire a signed language—the only type of language that they could get full natural exposure to—until their teens or adulthood show general cognitive deficits, and may never acquire any language in the same way if they had started when they were young children.
- For a long time people thought that deaf children would only learn spoken language (via lip reading) if they were prevented from signing, and some ill-informed professionals still sometimes perpetuate this view today. But in fact evidence shoes that the acquisition of a signed language provides a foundation for later learning a spoken language (if a Deaf person does want to learn a spoken language).

Nobody is certain *exactly* what the **critical period** for language acquisition is, but there is general agreement that it ends before puberty, and perhaps as early as 6 or 8 years old.

The critical period is also referenced in discussions of **second language acquisition** (aka L2 acquisition), the general cover-term for a language you learn *after* you've made some progress on acquiring a first language.

- It is a bit tricky to distinguish L1 vs. L2 for languages children start speaking in early childhood, though languages taught explicitly in school (i.e. via formal language instruction, not just by happening to go to a school where a different language is used than in the child's home) are usually treated as L2 languages, even if they were taught beginning at age 4 or 5.

This isn't totally different from other aspects of cognition. For example, we know that exposure to visual stimulus is important to the development

of the brain's visual system. We also know that human brains are more **plastic** early in life: if a child suffers a serious brain injury to part of the brain that is associated with a certain function, it's possible for that function to move to another part of the brain (in a way that is much less likely for adults).

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2. **Language acquisition does *not* depend on explicit "teaching" by caregivers, or a particular way of talking to children**

In some cultures, there is a particular "style" used when talking to children, sometimes called *babytalk* but more formally called **child-directed speech** (historically called "Motherese"). This is sometimes treated by parents and adults as being *necessary* to help children learn to speak. In some cultures people think more generally that children will only learn to speak if they're formally "taught" by their caregivers, and that it's therefore necessary to model vocabulary or correct any errors.

- For example: "This is a truck! Can you say *truck*?"

But in other cultures, there's no particular register used to speak to children, and parents and other caregivers don't necessarily speak very often to pre-linguistic infants (that is, to babies who can't themselves talk yet).

And yet, children in **all** cultures and societies begin to speak on about the same schedule, progress at about the same speed, and develop equally complex grammatical knowledge!

From this, we know that cultural differences in how we interact with children aren't particularly relevant for language acquisition—even when our cultural ideas about language insist that they're really important! It's important for scientists who study things like language to be aware of how linguistic practices vary across cultures, and to avoid assuming that their own cultural practices are "normal" or universal.

3. ***Perception* and *production* proceed separately in language acquisition, with perception being ahead**

Perception refers to the ability to perceive or understand language, while **production** refers to the ability to produce language—in other words, to speak or sign.

It is always the case that children understand much more than they can say themselves—and this is true at all stages of language acquisition!

- Children have figured out which sounds contrast in the language they're exposed to—its phonemes—before they have the motor control to produce all those sounds.
- Children can understand some words in their language(s) before they say their first words.
- Children can understand multi-word sentences produced by adults before they themselves reliably produce sentences longer than 1–2 words.

These general facts are part of what researchers who study first language acquisition are trying to explain—along with specific generalizations about how children acquire certain parts of grammar.

21.2 Acquisition of phonology in L1

Our focus this week is the acquisition of **phonology**. In spoken languages this relates to the acquisition of sound patterns, and in signed languages to the system of signs.

Every baby starts out equally prepared to learn whatever language they happen to end up being exposed to! In order to do that, they need to start out able to pay attention to anything in their input that might end up being relevant.

21.2.1 Perception in phonological acquisition

Infants seem to be *tuned* to language: they pay attention to the things in their environment that involve people, and to the types of things people do to communicate using language. While most human societies use *spoken* languages—this seems to be a default for hearing humans—babies don't show any evidence of confusion if they happen to be exposed to a signed language instead, regardless of whether the baby itself is deaf or hearing.

Very young infants—at birth, and up to at least **6 months**—are equally able to distinguish any sounds or signs that potentially contrast in a human language.

- No matter whether they're being raised by people who speak Halkomelem, a Salish language that contrasts [k], [k^{w}] (labialize), [k'] (ejective), and [k^{w}'] (labialized+ejective) but doesn't have [g], or English, which only

voiceless [k] but contrasts it with voiced [g], any infant will initially be able to hear the difference between all those sounds equally well.

- No matter whether they're being raised by people who speak English (which contrasts [t] and [d]) or Mohawk (which doesn't, [t] and [d] are allophones of one phoneme in Mohawk), infants can hear the difference equally well.

By about **10 months**, however, infants will begin to stop paying attention to the phonetic differences that aren't phonologically **contrastive** in the language or languages they're exposed to.

And by about **12 months**—just one year old! Maybe not able to walk yet!—infants will be adult-like in only being able to easily distinguish sounds that are contrastive in the language(s) they're acquiring.

- Lots of studies have shown that adults are less good at discriminating speech sounds that don't contrast in any of the languages they speak—and many people have difficulty learning to hear contrasts in languages they only start speaking as teens or adults.
- Which languages are "hard" or "easy" to learn really depends on what language you're starting from, though—something we'll return to later.

It's a bit of an oversimplification to say that infants are born with **no** exposure to language. Before being born, human infants are exposed to some language—but filtered by the body of the person who gestates them. Investigation of newborn infants has shown that they're sensitive to **prosodic** differences between languages, differences in stress patterns and rhythm—so they can tell the difference between the stress pattern of the language spoken by the person who gestated them and other stress patterns, but not necessarily any differences in individual consonants or vowels.

21.2.2 Production in phonological acquisition

The flip side of language perception is language **production**, and this is something we're much more aware of when we interact with babies and children!

The first stage of language production is **babbling**. This starts around **6 to 10 months**, initially with single consonants followed by single vowels, usually repeated (e.g. "baba").

- For spoken languages, most children start with labial sounds and a mid central vowel, like *baba* and *mama*. These sequences in early babbling often end up as words for family members, in languages around the world! In English we have *mama* and *papa*; some English speakers also have *nana* as a word for grandmother.

- Stops and nasals are typically produced before fricatives; [l] and [r] sounds are often produced quite late (e.g. between 4 and 5 years old), as are difficult sounds like affricates and interdental fricatives.

Children also babble when acquiring signed languages! Just like spoken babbling can be distinguished from crying or other vocalizations, signed babbling looks quite different from gesturing or waving arms around. Signed babbling involved regular arm movements, and transitions between simple handshapes (for example, open palm or closed fist). See some of this week's linked videos for examples!

- One of the differences between acquisition of spoken and signed languages is that children are a bit **faster** producing signed language—fine motor control of the hands develops a bit faster than motor control

At around **12 months** children begin producing their first words, but often these words are **simplified** in various ways, because the child can't yet produce all sounds or all combinations of sounds.

Children acquire **onsets** (consonants at the beginning of syllables/words) before **codas** (consonants at the ends of syllables/words). They often start by only producing one-syllable words—they might **clip** longer words by only saying the first syllable, or only saying the stressed syllable.

Some of the phonological **errors** children make include:

- Syllable structure simplifications:
    - **Final consonant deletion** ([bu] for [but] *boot*)
    - **Cluster simplification** ([peɪ] for [pleɪ] *play*)
- Sound substitutions:
    - **Stopping**: replacing a fricative with a stop ([ti] for [si])
    - **Fronting**: replacing velars with alveolars (e.g. [kæ] becomes [tæ], *cat*, also with final consonant deletion)

    - **Gliding**: replacing [l] and [r] with [w] or [j] ([pweɪ] for [pleɪ] *play*)
    - Other patterns of **substitution**, e.g. replacing all voiceless fricatives ([f], [θ]) with [s]
    - **Initial voicing**: all initial segments become voiced (e.g. [kæ] becomes [gæ], *cat*, also with final consonant deletion)
    - **Final devoicing**: all final segments become devoiced (e.g. [dɑg] becomes [dɑk], *dog*)

- Assimilation

    - **Consonant harmony**: changing the consonants in a word so that they're all the same (e.g. [dɑg] becomes [dɑd], *dog*)

(These processes are summarized in a table in the reading for Week 10, if you'd like a second source.)

Many of these are processes that also happen in the regular phonology of some languages, especially as part of **word borrowing**. But some are specific to child language! For example consonant harmony is pretty rare in the world's languages, but quite common in the process of acquisition.

Not all children do all of these—or even any of these. But all of them are very common, and they all serve to make words **easier to say**. Since children haven't totally mastered fine control of the muscles in their vocal tract (or any other muscles! Small children aren't known for their fine motor skills!), they fit words into patterns they *can* produce.

Many of these processes are *regular* for certain children at certain ages. For example, a child might very reliably turn all [f]s into [s]s, or might turn [s] into [ʃ] before high vowels. We can express these patterns as *rules*, just as we would for an adult phonological system! What makes them different is that children eventually grow out of some of their simplification patterns, and acquire the same phonology as the adults around them.

- But not always! One of the common paths of **sound change** in language is articulatory simplification—the trickier a sound or sequence of sounds is to pronounce (or perceive), the more likely it is to change over time, to be replaced with something easier.

By the time they're about **seven**, children produce mostly adult-like segments in the language they're acquiring.

21.3 Production vs. Perception Again

Just because a child *says* "cat" as [tæ] doesn't mean they *hear* "cat" as [tæ]. If you've interacted with a small child, you might have tried repeating back their mispronunciations to them—with mixed results! If you try calling a cat [tæ] when speaking to a child, they might angrily correct you:

Child: [tæ]! Adult: Yes, that's a [tæ]! Child (shaking head): no, [æ]!

This is one of the many ways we know that children can *hear* differences even when they don't produce those differences in their own speech.

21.3.1 Bilingualism and Multilingualism

As noted above, it's no harder for a child to acquire multiple languages than it is for them to acquire just one! In fact, if we look at societies around the world and through human history, it's *monolingualism* that seems unusual.

Children acquire all the sounds of all the languages they're exposed to, and can discriminate all those sounds equally easily. Hearing children can also acquire a signed language and a spoken language in parallel, without difficulty.

- This is different from "baby sign", a system of signs mostly adapted from ASL that some people use to communicate with infants who can't articulate speech sounds yet. There's nothing wrong with baby sign, but it consists of only a few fixed signs, and isn't the same as exposure to an actual sign language like ASL.

We return to the topic of bilingualism and multilingualism in Week 11.

21.3.2 Methods

The textbook and some of the videos posted this week talk about various **experimental** methods used in studying language acquisition.

The other main method used in studying acquisition is **observational**. This involves recording what a child says and what is said to them in the process of acquisition.

This is extremely time consuming! Most observational studies observe a child with their primary caregiver for only an hour or two at a time, over the course of several years (to see development over time). Obviously this misses a lot of what goes on in the process of language acquisition! You will often see corpora (bodies of text) in language acquisition studies that involve only one child, or only a few children.

- There is a large online collection of corpora of language acquisition, for a number of languages, called CHILDES (Child Language Data Exchange System): https://childes.talkbank.org/

There was one study that aimed to record *everything* said to and by a child in the first few years of life. This study was done by a researcher named Deb Roy, at MIT, in collaboration with his wife Rupal Patel, who is also a language researcher. They wired their house with microphones, and recorded everything said to or by their child for several years. This is one of the most complete corpora of language acquisition ever created—but it's only for a single child!

21.4 Acquisition of phonology as an adult: L2 acquisition

We'll refer to **second-language acquisition** or **L2 acquisition** to refer to any language that you learn after you've already completely acquired a first language. People sometimes also talk about L3 acquisition—languages you learn after you already have experience learning an L2—but this further distinction isn't always made!

- The line between L1 and L2 acquisition is fuzzy for languages learned in childhood. For simplicity, in LING 100 we'll talk mostly about L2 acquisition that takes place as a teenager or later.

When we talk about L2 acquisition, we often don't distinguish between languages learned formally in a classroom, and languages learned by simple exposure to speakers. For most adults, explicit teaching (whether in a classroom or not) is also a key component of learning new languages—unlike babies, adults can't spend 100% of their time figuring out a new grammar! The distinction between "acquisition" and "learning" is therefore also a bit fuzzier for L2 acquisition.

The biggest difference between L1 and L2 acquisition is that when an infant is figuring out their first language, they're starting from scratch—they might have some kind of innate cognitive template for language structure (the hypothesis of linguistic **nativism**), but they don't have any actual grammatical system yet.

In L2 acquisition, by contrast, the learner does already have at least one complete grammar (more if they acquired more than one language simultaneously as a child)! This brings with it both pluses and minuses:

- On the plus side, their existing language can **scaffold** their new grammatical knowledge. When learning vocabulary they can rely on translation, for example, rather than trying to figure out word meanings from scratch.

- On the minus side, their existing knowledge might **interfere** with the new system they're learning—if the speaker's expectations from their first language (conscious or unconscious) don't match how the L2 works, they might face extra challenges in learning the new system.

This interference can be particularly visible in the acquisition of sound patterns. If you've ever learned a new language—and most of you probably have!—you'll have experience of this.

- The sounds in a new language that are the **same** as your first language are the easiest to learn—in fact, you don't even need to learn them!

- The sounds that are **new** are often the difficult ones—in fact, it can be difficult to even learn to *hear* contrasts between sounds, if those sounds don't exist in your L1.

    - Sometimes if sounds are *entirely* new they're a bit easier.
    - But if the L2 you're learning **contrasts** two sounds that are **allophones** in your L1, then it can be extra difficult to learn to hear and produce the contrast—you have to "unlearn" your lifetime of experience in *ignoring* certain phonetic differences.

For example, English speakers who are learning Hindi often have difficulty not just producing the contrast between pairs like [ta] and [t^ha], but even *hearing* the difference.

Another example arises when speakers of languages like English, where the *tone* or *pitch* of vowels isn't contrastive, learn languages like Mandarin. In Mandarin the *tone* of a vowel is meaningful—English speakers, who aren't used to paying attention to pitch in the context of individual morphemes, have a hard time both perceiving the differences and producing them.

- By contrast, if your L1 is a language that makes **more** use of tone than Mandarin does, you won't have the same problem. While Mandarin has 4 tones, for example, Cantonese has 6 (or 9, depending on how you count).

    - I took Mandarin for part of a year in high school, and the students in the class were either native English speakers or native Cantonese speakers. The English speakers spent a lot of time simply learning to hear the differences between tones, while the Cantonese speakers were able to move onto other aspects of grammar much sooner!

While all humans learn their first language(s) equally well, and at about the same speed, people differ a lot in how easily they acquire additional languages, especially as adults.

For this reason, people have sometimes argued that we learn languages *differently* after the critical period, in our teens or later. While acquiring our first language makes use of our language-specific cognitive abilities, this theory goes, acquiring languages as an adult involves a much more general, and much more conscious learning method. But this is a topic of much debate!

21.4.1 Accent Prejudice

Even if we become fully fluent in an L2, the **transfer** from our L1 often leaves us with a perceptible accent—people who hear us speak may be able to tell that we're not a native speaker of the local majority language.

Speaking with this kind of "non-native accent" can result in prejudice or discrimination, in the same way that speaking a stigmatized variety of a language does. This can arise in a few different ways.

First of all, if people don't have much experience hearing people who are L2 speakers, they are often worse at understanding such speakers—the same is true for people who don't have much experience understanding speakers of other varieties. This is something that improves with practice, more or less automatically! As you hear certain ways of speaking more, you get better at perceiving them.

But also, our attitudes about non-native accents often reflect stereotypes or prejudices about certain ethnic or racial groups, or people from certain countries. For example, in English speaking countries France is often associated with romance, and so French accents are perceived as desirable or romantic. German accents, by contrast, are perceived as "guttural" or "harsh", independently of the actual sounds involved.

- While it may be intended as a compliment, many people find it unpleasant to have other people frequently comment on their accent—even if the comment is that they have a "beautiful accent". Remember,

> anything you say about someone's accent is something they've likely heard many times before! Think twice before making comments like this to someone who isn't already a friend.

Accent prejudice can extend to how well people are evaluated as doing their jobs, or to how intelligent they're perceived as being. Studies have found that instructors who speak English with a non-native accent systematically receive lower teaching evaluations, for example, even on items that don't have anything to do with intelligibility (availability for meetings, for example, or overall organization of the course). See for example Zabalaga-Haberman et al. (2020).

How do we address this type of bias? The best first step is to be aware of it. These evaluations are often mostly subconscious, so it's important to stop yourself and ask whether a particular perception or attitude is based on another person's actual qualities, or whether it's simply carried over from your perception of their accent. It can be hard to do this at first, but like listening it gets easier with practice! Once you've identified your own accent biases, you can work to counter them in you actual evaluations.

One thing we know from linguistics is that there's nothing objectively better or worse about particular accents—and that includes non-native accents! In many contexts it may be important that someone speaks a particular language *fluently*—that they can understand others, speak, read, and write without hesitation or difficulty—but that is very different from it being important that someone be indistinguishable from a native speaker.

Chapter 22

Winter Week 10: Acquisition of Morphosyntax

Contents

22.1 Acquiring morphology and syntax in your first language(s)

Language acquisition involves much more than figuring out the sounds or signs of the language, and being able to produce them! Once a child has figured out these basic building blocks, they are faced with arguably the much more difficult task of figuring out the abstract structure and meaning of words and sentences.

This week we're looking at the acquisition of **words** (vocabulary), **morphology**, and **syntax**, and we'll go more or less in that order.

22.1.1 Lexical Acquisition

The first thing a child needs to do is start figuring out the association between sounds and meanings—that is, figuring out words/morphemes.

Part of this is learning just to segment speech into individual words. After all, they don't see or hear language divided up neatly into words, the way we write in English, theyseeorheareverythingruntogetherintoasinglestreamwithoutpauses.[1] To do this they need to figure out some fairly sophisticated phonology about syllable structure, stress (in some languages), and possible word shapes—phonology that's more complex than what we've covered in LING 100!

- For example, in a language with stress, each content word (noun, verb, adjective, adverb) will have exactly one primary stress—this is true of all languages that have stress.
- Similarly, certain clusters of consonants occur only at word boundaries, or only in the middle of words. For example, in English you'll only get the cluster [tl] in the middle of a word (because it always involves [t] at the end of one syllable and [l] at the beginning of the next one).

Once a child has figured out enough phonology to isolate words, they now have the even bigger task of figuring out what the words *mean*.

To see why this is a difficult task, consider a hypothetical example proposed by the philosopher W. V. Quine (Quine was talking about challenges of translation, but the point applies equally well to children trying to figure out word meanings).

- Imagine you're interacting with someone who speaks a language that you don't understand at all. Suddenly you both see a rabbit, and the other person says "gavagai!" You might assume this means "rabbit!" or "it's a rabbit!", but it could mean "it's quick!" or "let's try to catch it" or "good luck!" (if we imagine that rabbits are seen as lucky), or any one of a number of other things.

If you hear "gavagai" on subsequent occasions, you might manage to narrow down the range of possible meanings, but this will require closely tracking a lot of information about every situation where someone uses a word!

[1] "they see or hear everything run together into a single stream without pauses"

From this perspective, it's very impressive that human babies do manage to figure out words as quickly as they do.

On average, children **produce** vocabulary on about the following schedule (*all ages are averages! There is a lot of variation!*):

- 10–12 months: first words
- 18 months: about 50 words
- 24 months: about 500 words

But even at 10–12 months, we often know that children **perceive** or **understand** many more words, because they react appropriately when those words are said to them!

After this point, kids start learning words even faster. Kids learn words *very quickly*, once they get going—each word you learn makes it easier to learn other words! By around 30 months (2.5 years) kids are learning as many as 10 words a day—and as they go, they can make use of what they've figured out about **morphology** and **syntax** to go faster.

While acquiring words kids do make certain kinds of errors, assigning the wrong kind of meaning to nouns and verbs in particular.

Kids might **overextend** a noun, applying it to a wider set of objects. For example, kids might use "dog" to describe all four-legged animals, or might use "mom" or "mama" for all adults, or all adult women.

Kids also might **underextend** a noun, applying it more narrowly. An example of **underextension** would be thinking that "dog" is a name for just your family's pet dog.

Children usually start out acquiring nouns and verbs, and slowly move onto more functional vocabulary—we'll see below in discussing the acquisition of syntax that it's a while before children produce sentences that are long enough to include functional words.

Aside on the "word gap"

These rates are pretty stable across people and across languages. You might have heard of something called a "word gap", the idea that kids from some socio-economic backgrounds don't hear as many words, which is supposed to explain gaps in academic achievement in early education.

- The claims of a "word gap" are based on studies that involved researchers going into the homes of families with different socioeconomic backgrounds to see how much speech children heard in an average day. These studies claimed to find big differences in the average number of words kids heard in different homes.
- But this research was deeply flawed: researchers only counted "quality" speech, where "quality" meant the kinds of child-directed speech that are typical in white middle-class families. They didn't count, for example, conversations taking place *around* children, if they weren't explicitly directed at the child.
- We know that children all over the world acquire their first language or languages equally well regardless of cultural standards about how (and whether) you talk directly *to* children, so there is no reason to think that children from non-white or lower socioeconomic backgrounds are "linguistically deprived" because their parents don't speak to them "correctly."
- The "word gap" myth probably persists for two reasons. First, it's big business! Many programs and professionals are invested in "fixing" the word gap, and they make a lot of money from this. Second, the "word gap" plays into other aspects of structural racism in society: children from some backgrounds do do less well in early education than children from other backgrounds. The "word gap" myth conveniently blames the linguistic practices of children's families for this achievement gap, which avoids facing the fact that schools and education are set up to privilege the linguistic practices of white middle class communities, and to treat them as what "normal language" looks like.

22.1.2 Morphological Acquisition

After children have learned some individual words, they can go on to start figuring out the **morphology** inside those words.

Children often go through stages in acquiring morphology like **plural** or **past**:

1. No use at all (e.g. "dog" and "foot" when adults would say "dogs" and "feet")

2. Sporadic use, possibly memorized (but not yet analyzed) plural forms like "dogs" and "feet"

3. Evidence of figuring out the regular rule, by **overapplying it** to words that are actually irregular: "dogs" but also "foots" or "feels"

4. Figuring out the exceptions to the regular rule, adopting the adult system of "dogs" vs "feet"

We know that children figure out productive morphological rules partly because of overgeneralization, but also because of experiments that have shown that at the same age where they say things like "feets" or "goed" (which they would have never heard an adult say!), they also start producing regular plurals for nonce words. This is the famous "wug test" that you might see references to.

English has relatively little morphology, but in other languages children have much more morphology to figure out! Children can figure out even very complex systems of inflectional morphology, but they tend to do this a bit faster for languages where all words take the same endings (like Turkish or Hungarian), as opposed to languages where words fall into several different inflectional or declension classes (like German or Russian).

As children figure out morphology, this can help them pick up new vocabulary! For example, once you know what morphology appears on nouns vs. verbs, you can use this to figure out which words are nouns and which ones are verbs.

But sometimes it's possible to take this too far! For example, a very common derivational suffix in English is the agentive *-er*: a *teacher* is a person who teaches, a *baker* is a person who bakes, a *liar* is a person who lies, etc. But not every word that ends in *-er* is a noun derived from a verb in this way! However, children sometimes ask questions that show that they think *-er* occurs in a word where it doesn't for adults, for example on being told that a building is a *theatre*, a child might ask "what does it mean to thee-ut something?"

- In this history of English some verbs have been *backformed* from nouns by exactly this process! The verb "to edit", for example, was derived from the noun "editor", which sounds like it could contain the *-er* suffix but historically did not.

22.1.3 Syntactic Acquisition

Once children have figured out individual words they can also start trying to put them together into sentences. Syntactic **production** goes through approximately the following stages:

- One-word stage: 10–12 months
- (Word + gesture)
- Two-word stage: 18–24 months
- Telegraphic stage: $_{24}$ months

In the "two-word" stage, utterances might consist, for example, of a verb and a noun, where the noun could be the subject or the object of a verb (depending on their order), or a noun and an adjective, or two nouns that are related somehow. (In the preceding word + gesture stage, the gesture might stand in for a verb.)

After the two-word stage, the number of words doesn't increase one-by-one. Instead the next stage is usually described as **telegraphic**: sentences don't have a fixed length, but are still missing "grammatical" or "function" words like auxiliary verbs, determiners, complementizers, etc.

It's after this that children start figuring out things like movement rules, used to form questions or passives in some languages.

For example, children often produce their first WH-questions without either WH-movement or Subject-Aux inversion:

- You saw what?

They might figure out WH-movement before they figure out Subject-Aux inversion:

- What you saw?

Sometimes you see **doubling**, where children pronounce the WH-word both at the front of the sentence and in its original position:

- What you saw what?

On their way to figuring out Subject-Aux inversion, children sometimes analyze "do" as a kind of question marker (like French *est-ce que* or Mandarin *ma*), doubling *did* with a still-past-tense verb:

- What did you saw? *or*
- What did you did saw?

Other sentence types take a while to be acquired: for example, children take a while to figure out **passives**. You can show that they only get to adult-like interpretations of passive sentences around the age of 6 years or later. Up to that age, they tend to interpret passive sentences like *Ernie was seen by Bert* as meaning the same thing as *Ernie saw Bert*.

- Ernie saw Bert.
- Ernie was seen.
- Ernie was seen by Bert.

This is a useful thing to keep in mind if you're talking to young children—if you use passive sentences, they might *act* like they understand you (and they might think they understand you!), but actually interpret the *opposite* of what you mean to say.

Other things that are acquired late are certain epistemic interpretations of modals—meaning interpretations based on what you conclude based on your knowledge, vs. what people are obliged to do.

- My friend must be home.
    - *epistemic:* based on the facts, I conclude that my friend is home
    - *deontic:* there's a curfew, and so my friend is obliged or required to be home.

Acquisition of syntactic **rules /movement**

22.1.4 Evidence for linguistic nativism

Much of the debate around linguistic **nativism**—the hypothesis that there is some language-specific component to human minds, that is needed to learn the types of grammars found in human languages—concern the acquisition of syntax (and semantics).

The arguments for nativism are often of the following form:

- Based on the data children hear, there are multiple possible grammars (systems of syntactic generalizations) children could assume

- Despite this, children **never** assume some of those empirically-possible grammars
- Therefore, there must be something about our cognitive capacity for language that rules out the never-considered-by-children potential grammatical systems.

What do these types of generalizations look like? Some of them involve fairly intricate restrictions on WH-movement, known as **subjacency**. Let's walk through an example of this:

When we ask a *when* question like the following, there are two potential interpretations, in English and in many other languages, depending on where the word "when" started out.

- When did the kids tell their parent __ [that they broke the TV __]?
    - *Meaning 1*: At what time did the telling happen?
    - *Meaning 2:* At what time did they wake up?

This ambiguity arises because of the embedded clause in the WH-question. In the following sentence, by contrast, one of these meanings goes away:

- When did the kids tell their parents __ [how they broke the TV]?
    - *Meaning:* At what time did the telling happen?
    - *Cannot mean "at what time did they break the TV?"*

WH-questions that involve moving out of an embedded clause are very rare in natural speech! We don't say them very often—and even when we do say them, we don't say "oh, and by the way, this sentence is ungrammatical if you try to interpret it to mean X".

Nonetheless, if you test kids on their interpretation of sentences like these, you can show that they never consider the possibility that sentences like "When did the kids tell their parents how they broke the TV?" might have the ungrammatical interpretation! And this isn't true just for English, it's true for any language where you test this.

The generalization is that you can't have a WH-question that asks about something inside a lower WH-question (in the previous example, the embedded WH-question involves the question word "how"). This is a very structure-dependent generalization, and many linguists argue that this is the type of pattern that can't be figured out just from the sentences children

hear—instead, there must be some language-specific constraint on possible grammars, which helps human children limit the range of possible syntactic systems they're figuring out.

Arguments like the one above don't tell us what the innate cognitive component specific to language—sometimes called Universal Grammar or UG—contains, but they argue that something of this kind must exist!

22.2 On the absence of negative evidence

A key point here is that children acquiring language don't have any exposure to what's called **negative evidence**: there are some sentence types that a child never hears, but there's no obvious difference between the sentences a child just accidentally hasn't heard (because that sentence type is rare) and sentences they haven't heard because those sentences are ungrammatical for adult speakers.

The generalization about subjacency is of this type: sentences with "long" WH movement are rare, but grammatical, but what children have to figure out is that *some* of those sentences lack an interpretation that's available to other sentences of a similar type. Logically speaking, it's been argued that there is no way to reach the correct generalization exclusively on the basis of reasoning about the sentences you hear (or on the basis of "shared attention", or the human desire to communicate with each other).

Children do get **corrected**, sometimes, but these supply only a very limited kind of negative evidence! Children are quite resistant to explicit correction of their grammar (they're saying things that are totally grammatical in their own grammar, after all!), but may use **recasts** or **repetitions** to help generalize about how adult grammars are different from their own grammar. For example, a *recast* is something like the following:

- *Child:* Kitty friendly!
- *Adult:* Yes, the kitty is friendly!

Here the adult isn't correcting the child, but the child might notice that the adult is agreeing with them while also using the words *the* and *is*, which gives evidence that those words are necessary in this type of sentence in English.

Some studies have shown that recasts and repetitions might *facilitate* the acquisition of certain syntactic generalizations—but since not all parents or caregivers give recasts or repetitions of child utterances, we know that they can't be *necessary* for human language acquisition.

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Chapter 23

Winter Week 11: Multilingualism, Bilingualism, and Language Policy

Contents

Having talked about language acquisition at an individual level, this week we're going to look at some topics that relate to the context in which children acquire languages on a more societal level, looking at contexts where for various reasons languages do not end up being transmitted from one generation to the next.

When this happens systematically, the result is language **endangerment**. But language endangerment isn't simply an accidental result of individual choices, it's very often the result of conscious policy that seeks to eliminate minority language groups. For this reason, in talking about heritage languages, language endangerment, and language revitalization, we also talk this week about language **policy**.

This discussion touches on the history of residential schools in Canada, as well as the relationship between language loss and (attempted or successful) cultural genocide. These are heavy topics, which I mention in advance so that the discussion doesn't catch you unawares.

23.1 Heritage Speakers

When we talk about the acquisition of a first language, we are often focused at a very *individual* level. But we can also think about language acquisition in a broader social context—a broader context that is often itself multilingual.

If a child acquires the local majority language—in most of Canada this is English, in most of Quebec it would be French—then the language they acquire at home will be reinforced at school, and in every other part of their lives.

But if a child acquires a minority language at home, then this language won't be reinforced in other parts of their lives. Sometimes this results in a child not gaining total fluency in the language used at home.

Someone who is not totally fluent in a language spoken by members of their family is often referred to as a **heritage speaker.** There is a wide range of ways to be a heritage speaker, however.

- A heritage speaker might be someone who is fully fluent, but whose vocabulary and register is limited to the topics and styles you would use with close family members.
- Alternatively, a heritage speaker might not be totally fluent when speaking, but easily able to understand others when they speak. (This is sometimes called *receptive bilingualism*.)
- A heritage speaker might instead only know a few words or phrases, or might not know any of the language at all, though they spoke some of it as a young child.
- Finally, a heritage speaker might be someone who didn't grow up in a household where the language was used, but who has an ancestral connection to the language, or belongs to a community that uses the language.

Heritage speakers are likely to be at an advantage when learning their heritage language as adults. Someone who simply lacks certain vocabulary or registers, or someone who is receptively bilingual, may be able to pick

up the language relatively easily simply by interacting with other fluent speakers. But given the considerable role of motivation in the success of language learning as an adult, all heritage speakers are in a strong position to succeed as adult learners.

In Canada, many people may be heritage speakers of languages spoken by their parents or grandparents (or relatives further back) upon immigrating. In other cases a language may not have been transmitted to children born in Canada, who instead grow up speaking English or French only. In my case, for example, my father's father immigrated from Sweden as a child—hence my last name *Bjorkman*—but as an adult used only English, and did not pass Swedish on to his own children.

In the case of immigrant languages, it is often the case that the language is a majority language (or a healthy minority language) elsewhere in the world, even if it's not widely used in Canada.

There are also many people in Canada who are heritage speakers of Indigenous languages that are not spoken elsewhere. In these cases, the loss of fluency across generations results in **language endangerment**.

23.2 Language Endangerment

What does it mean for a language to be **endangered**?

UNESCO (the United Nations Educational, Scientific and Cultural Organization) has developed criteria for assessing the vitality of a language. Languages that do poorly on these criteria may be considered endangered, or vulnerable to endangerment:

1. **Intergenerational transmission:** are new generations of children learning the language, or are they instead growing up speaking another language?

2. **Total number of speakers:** languages with more speakers are more secure, and less vulnerable to endangerment.

3. **Proportion of speakers in the wider population:** regardless of the absolute number of speakers, a language that is spoken by a larger percentage of a local or national population is more secure.

4. **Maintenance in existing language domains:** the language continues to be used in settings and for purposes that it was used in the past.

5. **Extension into new domains:** a language that's vulnerable to endangerment might not be actively extended into new media or domains, for example may not be used on the internet or in new professions.

6. **Literacy and language materials:** the existence of educational materials, for children and adults, is a factor in assessing language vitality.

Why do languages come to be endangered?

Languages that have *no* living speakers are sometimes referred to as "dead" languages. People who work on language revitalization object to this terminology however, particularly for Indigenous languages, because it suggests that the language is no longer used at all, and that it cannot be revived.

Instead we can refer to languages with no living speakers as **sleeping**: with effort, they can be awakened for daily use.

- Etruscan might be called a dead language: this language was spoken in parts of Italy at the same time Latin was, but ceased to be used around the first century C.E., and has no known descendants.

23.2.1 Status of languages in Canada

Most Indigenous languages spoken in Canada are endangered, many of them critically endangered. Many languages spoken on the West coast, for example, were never spoken by very large speakers, and may now have only a few living speakers, all very elderly. In these cases, revitalization efforts proceed together with *documentation* efforts, to help ensure that materials exist for future learners and members of the community.

There are 7 languages in Canada that are assessed as *vulnerable* rather than as endangered outright. These are:

1. Cree (including many languages on the Cree dialect continuum)
2. Anishinaabemowin (Ojibwe)
3. Innu (Montagnais-Naskapi)
4. Mi'kmaq
5. Inuktitut (dialect continuum)
6. Dene Sųłıné

7. Stoney (Nakota)

Why do languages become endangered? There are many reasons, often interrelated:

- Negative attitudes towards the language
- Perceived association with lack of economic opportunity
- Perceived link between speaking the majority language and social mobility
- Government policies promoting assimilation

While the first three items on this list are comparatively "intangible", it's government policy that has played a huge role in Canada and in many other languages, both in the past and today.

23.3 Language Policy

What types of policies do governments enact that result in language endangerment? Examples here are drawn mostly from Canadian history.

We might start by asking *why* governments seek to limit or reduce the use of certain languages. These almost always reflect a goal of *assimilation*, due to bias against their continued existence as part of a national political entity.

- Policies about language may be part of broader policies against minority groups, but sometimes policies are language specific—though given the close tie between language and social and cultural identity, policies against the use of a distinct language are often inextricable from policies that aim to reduce the distinct identity of a social and cultural group.

How do governments specifically limit the use of certain languages?

- Make access to government services or the legal system dependent on use of the majority language.
- Prevent use by children, by enacting policies relating to the use of the majority language in schools and education.

- See the next section for specific discussion of the history of residential schools as sites of the Government of Canada's efforts to eliminate Indigenous languages.
- A recurring issue for minority language rights in Canada has been the struggle for access to French-language education for francophone populations outside Quebec.

When it comes to education, children learn best when educated in their home language. Schools also plays a big role in daily life for children, so they can be sites of language preservation—or language loss. For these reasons, the right to education in a minority language has played a big role in discussions of language and human rights, both in Canada and globally.

People sometimes feel that it's important for education to be in a "national" or "standard" language, as one part of establishing a shared national identity. But if national identity requires taking away the cultural heritage of some groups of people, what was it based on in the first place?

There is widespread acceptance that people have certain rights to maintain the use of minority languages, but there is still much more to do to help ensure that people indeed are able to continue to use—or re-establish—the language of their cultural or ethnic heritage.

In Canada the language rights of both English- and French-speaking communities were established in law in the Official Languages Act (1969), which applies at the federal level and makes both English and French the official languages of government in Canada. The Canadian constitution (1982) also recognizes both English and French as official languages—Indigenous languages do not (yet?) have official status at the federal level.

Relating to other topics discussed in the context of language acquisition: a very important issue when it comes to minority language rights, as well as human rights relating to accessibility, is access to signed language for d/Deaf individuals, particularly children.[1]

Perhaps the most significant government policy was the residential school system that was established through much of Canadian history.

23.3.1 Residential Schools in Canada

Residential schools were established in a number of colonial nations, including Canada, as part of an explicit policy of assimilation. The goal was

[1] The word Deaf is spelled with a capital 'D' to refer to culturally Deaf individuals, people who participate in Deaf culture, partly defined by a shared signed language—in anglophone North America mostly ASL, in Quebec LSQ (**Langue des signes québécoise**).

to eliminate Indigenous cultures and languages in favour of majority white European society.

This involved removing children from their families, in order to prevent them from being brought up within Indigenous culture, and to prevent them from using Indigenous languages.

- This meets one of the definitions for genocide established by the 1948 UN convention on the prevention and punishment of the crime of genocide: "**(e) Forcibly transferring children of the group to another group.**"

Residential schools were sites of terrible abuse, but even without outright abuse, children in residential schools were prohibited from speaking their first languages, and punished if they did use them.

This resulted in generations of adults who were both traumatized by their experiences, and who chose not to pass their languages on to their children, in part to spare them the experience of being punished for speaking the language.

The last residential school in Canada was not closed until **1996**.

In the wake of the residential schools closing, a number of survivors brought a class action lawsuit against the Government of Canada. This suit was successful, and one of its results was the establishment of the Truth and Reconciliation Commission (TRC), whose aim was to make recommendations for how the relationship between Canada and Indigenous nations could be repaired in the future.

The recommendations of the TRC were published as Calls to Action in 2015.

Given Canada's heritage of failing to respect treaties with Indigenous peoples, and of actively working to eliminate distinct Indigenous societies and cultures, often specifically through active measures to eliminate the use of Indigenous languages, Canada has a long way to go in working to help support the revitalization of Indigenous languages. This will involve support for education in Indigenous languages, including immersion programs.

23.3.2 TRC *Calls to Action* relating to language

Full text of the Truth and Reconciliation Commission's Calls to Action (Recommendation #10 under "Education")

- We call on the federal government to draft new Aboriginal education legislation with the full participation and informed consent of Abo-

riginal peoples. The new legislation would include a commitment to sufficient funding and would incorporate the following principles:

- Providing sufficient funding to close identified educational achievement gaps within one generation.
- Improving education attainment levels and success rates.
- Developing culturally appropriate curricula.
- **Protecting the right to Aboriginal languages, including the teaching of Aboriginal languages as credit courses.**
- Enabling parental and community responsibility, control, and accountability, similar to what parents enjoy in public school systems.
- Enabling parents to fully participate in the education of their children.
- Respecting and honouring Treaty relationships

Language and culture

- We call upon the federal government to acknowledge that Aboriginal rights include Aboriginal language rights.
- We call upon the federal government to enact an Aboriginal Languages Act that incorporates the following principles:
  - Aboriginal languages are a fundamental and valued element of Canadian culture and society, and there is an urgency to preserve them.
  - Aboriginal language rights are reinforced by the Treaties.
  - The federal government has a responsibility to provide sufficient funds for Aboriginal-language revitalization and preservation.
  - The preservation, revitalization, and strengthening of Aboriginal languages and cultures are best managed by Aboriginal people and communities.
  - Funding for Aboriginal language initiatives must reflect the diversity of Aboriginal languages.

- We call upon the federal government to appoint, in consultation with Aboriginal groups, an Aboriginal Languages Commissioner. The commissioner should help promote Aboriginal languages and report on the adequacy of federal funding of Aboriginal-languages initiatives.
- We call upon post-secondary institutions to create university and college degree and diploma programs in Aboriginal languages.
- We call upon all levels of government to enable residential school Survivors and their families to reclaim names changed by the residential school system by waiving administrative costs for a period of five years for the name-change process and the revision of official identity documents, such as birth certificates, passports, driver's licenses, health cards, status cards, and social insurance numbers.

23.4 Language Revitalization

Beyond the negative effects of government policy, there are positive things that governments can do to support minority languages.

These include funding education in minority languages, providing access to government services, including legal system, in non-dominant languages, supporting the use of languages in public spaces.

Language revitalization—improving the use of language in a community—also involves a great deal of effort within the community itself, including adults who commit to using the language more generally in daily life, and who work to create opportunities for children to acquire the language as a first language.

Some of these are discussed in the third lecture video this week, specifically Hebrew, Maori, and Mi'kmaq. For more information about revitalization efforts for Indigenous languages, see some of the bonus materials for this week!

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