

[SQUEAKING]

[RUSTLING]

[CLICKING]

[SIDE CONVERSATIONS]

**NORVIN  
RICHARDS:**

OK, so let's start back up. Today, let's see. We are transitioning from morphology into phonetics. So I hope you enjoyed morphology.

It's not as if you won't ever do any morphology again. But that's it for lessons on morphology-- lectures, I guess. Today is phonetics, which means that today we begin making funny sounds at each other.

So everybody limber up your vocal tracts. Let's see. I'm trying to remember if there's anything that I ought to announce. You remember, maybe, that problem set 1, which confusingly is your second problem set, is due on Thursday.

Normally, it would be due on Tuesday. But because I am technologically challenged, it's due on Thursday. Speaking of being technologically challenged, I just figured out how to get the projector to project over there instead of in the middle so that I won't have to write everything twice running back and forth across the room.

[APPLAUSE]

Thank you. Thank you. Thank you. I'm going to mention this when I go up for-- my chair is trying to decide whether to give me a raise. I'll be like, big academic achievement of the year was figuring out the technique.

So if anybody misses the old days, like you were amused watching me run back and forth, or this turns out to be too small or something like that, let me know. And we'll go back to the old days. OK. So when we speak, if we're speaking an oral language, if we're not signing, what we are typically doing is producing a flow of air, which typically comes out of your lungs, but not necessarily.

We'll talk about that. And it gets obstructed in various ways in the vocal tract. And so one standard way of talking about different kinds of speech sounds is to talk about where in the vocal tract the flow of air can get obstructed and how. And that's what we're going to do.

So first, we'll talk about where. So one way of categorizing the various things that your vocal tract does to the airflow is by what's called place of articulation. That is, where in your vocal tract is the flow of air getting obstructed?

So for example, there are what are called bilabial sounds. These are sounds which are made with both lips. This picture over here on the right is what's called the sagittal section. That is, it's a picture of someone's head cut in half so that you can see the stuff that's inside.

And those arrows are meant to get you to imagine that this person is making a sound by putting their two lips together. So that's what you do for the sounds that are at the beginnings of words like "paint," and "bath," and "mouth," and well, "wipe," where your lips don't touch, but they both move. Yeah?

Everybody feel free to confirm to yourselves in the privacy of your own mask that that is what you're doing when you make these sounds. Now next to the sounds-- so I have these words-- "paint," "bath," "map," and "wipe." And then next to them, I have these symbols in brackets.

And they may not look at it, but these are extremely technical symbols. These are symbols of the International Phonetic Alphabet. So linguists have a system for writing sounds down so that we'll all know what kind of sound we're talking about when we're talking about sounds. And--

**STUDENT:** [SNEEZES]

**NORVIN**  
**RICHARDS:** Bless you. A lot of the symbols of the International Phonetic Alphabet resemble letters of the English alphabet. So we have started here with symbols that should all look familiar. So the symbol for the sound at the beginning of "paint" is the letter p.

Yeah. And so that's a symbol of the International Phonetic Alphabet. As we go along, we will be seeing weirder and weirder symbols from the International Phonetic Alphabet. So please enjoy it while it's easy.

Yeah. So far, so good. Yep. There are also what are called labiodental sounds. Labiodental sounds involve your top teeth and your lower lip.

If you think about what you're doing at the beginning of a sound like "face" or "vase," what you're doing, at least if you're me, is bringing your lower lip pretty close to your upper teeth and obstructing the flow of air there so that there's some turbulence. Yeah? There are, I believe, no languages in which labiodentals are made with your bottom teeth and your upper lip. It's a little hard to do-- "face," "face."

We'll talk about other kinds of places of articulation that English doesn't use, but I think that one just doesn't exist. And again, two symbols of the IPA, which again, are not going to be too hard for you to learn. Yeah, so the symbol for the sound of the beginning of "face" is an f.

And the symbol for the sound of the beginning of "vase" is a v. Here we get our first two IPA symbols that are not letters of the English alphabet. These are interdental sounds. Interdental sounds are linguistically not hugely common.

We have them in English. There are various dialects of Arabic that have them. Some of the Berber languages have them.

But they're not all that common. These are the sounds of the beginnings of words like "thistle" and "this," where you're sticking your tongue between your front teeth and making air flow out. Yeah. "Th" [pronounced as in "thistle"], "th" [pronounced as in "this"]. English doesn't spell these differently, at least not reliably, right?

So we spell both of these with a "th." That's one of the reasons the International Phonetic Alphabet is there. It's so that we can unambiguously talk about what we're talking about.

So the sound of the beginning of "thistle" and the sound of the beginning of "this"-- they're not the same sound. We'll talk about the difference between them shortly. But at this point, maybe it's just clear they're not the same sound. So there are two different IPA symbols for them.

The Greek letter theta is used for the sound at the beginning of "thistle." And that second letter is an old English letter. It's still used in Icelandic. It's sometimes called "edh," and it stands for the sound at the beginning of "this."

Yep. OK. Then there are what are called alveolar sounds. If you put your tongue-- sorry, let me just talk first. If you put your tongue at the top of your mouth and drag it-- so put it first against your front teeth and then drag it backwards along the top of your mouth.

If you're like me, you've got your teeth. And then there's this flat-ish space. And then it goes up, yeah?

So from your teeth, you go back to this little plateau. There is this little plateau there right behind your teeth, this gum ridge. And then your mouth begins to go up higher, yeah?

That ridge is called the alveolar ridge. And if you put your tongue there, then you are all set to make sounds like the sound at the beginning of the word "teeth," or "duck," or "nail." And for sounds like "sail" and "zoom," again, you're not actually touching that position. We'll talk more about the difference between "s" and "t" in just a second.

But they're both alveolar sounds. Your tongue is pointing in the general direction of your alveolar ridge. Everybody have that sensation? You should all be exploring the insides of your own heads right now, yeah? OK.

There's a type of sound that has been called alveopalatal. It's also called postalveolar. I'll call it postalveolar.

If you think first about an "s" and then you think about a "sh," the "sh" at the beginning of "ship," if you go back and forth between them-- s, sh, s, sh-- you make a very soothing sound. Yeah?

And maybe what you can feel is that your tongue is rocking back and forth. At least, that's what my tongue is doing. For "s," it's pointing at the front at my alveolar ridge. And then for "sh," the middle of my tongue curls up a little bit, goes a little further back. Is that the feeling people are having as they're going back and forth between these?

Here's another new symbol. That's the symbol for the sound of the beginning of a "ship," and another new symbol. That's the sound in the middle of "azure," the "zh" sound.

Both of those are postalveolar sounds. You'll sometimes see them called alveopalatal sounds. I'll try to remember to always call them postalveolar. Yeah.

A little further back, there are what are called palatal sounds. These are either even further behind the alveolar ridge, back where the roof of your mouth gets as high as it's going to get. And the one palatal sound that we have in English is the "y" sound at the beginning of "year," yeah?

And here's the first IPA symbol that is deliberately designed to confuse you. The IPA symbol for that sound, the "y" at the beginning of "year," is a "j," yeah. This is because the IPA was not invented exclusively by speakers of English, right?

So it was invented also by speakers of languages like German, in which they use this letter for this sound. "Ja," for example, the German word for "yes," spelled J-A, yeah? Great.

OK. The letter y is used for something else. We'll get to it. OK. And then continuing our tour of the mouth, so we're working our way backwards through the mouth, there are what are called velar sounds.

In the velar sound, the body of your tongue is up against what's called the velum, which is the soft tissue at the back of your mouth that we're going to be hearing more about in a second. It's responsible for partitioning your mouth from your nose through your oral cavity. So that's the place that your tongue is touching when you say the sounds at the beginnings of words like "kernel," and "caught," and "gone," and when you make the nasal sound at the end of a word like "sing."

So if you think about where your tongue is, it's up in the back there. Does that sound right? Yeah? OK, cool.

And then going even further down, further down in your throat, you've got the vocal cords, the glottis, this space that's down there in your throat around your larynx, and your vocal cords. Or they're sometimes called your vocal folds. This process that you've got back here in your throat for closing off the air can be closed to make what's called a glottal stop.

English doesn't make a huge amount of use of the glottal stop. But it's what shows up at the beginnings of words like "uh-uh," that catch that you're getting in your throat. "Uh-uh," meaning "no," right?

Or "uh-oh," meaning "oh, dear." Yeah? That catch that you're getting in your throat-- that's a glottal stop, yeah? There are languages that are into glottal stops that have lots of them. English is not.

And the way you make that is by basically slamming your vocal folds together to close off the flow of air. You can also hold them close together and let the air whistle past. That's how you make an "h," right? As in, what's my word up there-- "help," yeah.

So you're just slightly abrading the flow of air. OK. Yeah, there are questions about any of that? So that was just a quick tour through the vocal tract. Yeah?

**STUDENT:** Where's, like, "chuh"?

**NORVIN** Oh, we haven't gotten to "chuh." Yeah, but good question. We can think of what that is. A "ch" sound at the beginning of a word like "church," also at the end of a word like "church," is a dynamic sound, right?

**RICHARDS:**

Ch-- I think your tongue is in motion as you are making that sound. Yeah. So it makes one-- it completely stops the flow of air. And then it gradually peels back and allows the air to flow out.

You can think of that first thing it's doing as-- I'm on completely the wrong slide-- as being like an alveolar stop, right? So it's like a "t." And then as it peels back, "ch," you end up with something like a "shuh," like a postalveolar. So it's a pretty complicated sound.

And we'll talk about it. Yeah, that's a really good question. Other questions? Somebody had a question? Yeah.

**STUDENT:** What's the difference between a glottal stop and an ending consonant?

**NORVIN** I'm sorry. Say it again?

**RICHARDS:**

**STUDENT:** What's the difference between a glottal stop and and, say, an ending consonant?

**NORVIN** An ending consonant?

**RICHARDS:**

**STUDENT:** Yeah.

**NORVIN** What kind of ending consonant did you--

**RICHARDS:**

**STUDENT:** [INAUDIBLE]

**NORVIN** Oh, oh, oh. Yeah, so that's a really good point. So glottal stop-- take a word like put, right?

**RICHARDS:**

If you say put, your tongue-- at least, my tongue-- touches the alveolar ridge. It goes where I said it would, yeah? But you're right. You also make a glottal stop, at least the way I just said it.

Put, yeah? You could contrast that. If you didn't make the closure at the alveolar ridge, it would sound like "puh." "Puh," right? Which is not an English word for me.

There are dialects of English in which that's something you would say, right? "Puh." There are places in English where things that we write as other kinds of sounds actually are, in fact, glottal stops, at least in my English.

So the difference for me between "can" and "can't"-- my wife, who is Japanese, is driven crazy by the difference between "can" and "can't" because they're virtually the same, right? It's very hard for her to figure out, often, whether I'm saying "can" or "can't." Because the difference between them is really mostly just-- "can't" is really just "can" plus a glottal stop.

I'm not saying "can't," usually, unless I'm being very emphatic. Yeah, good question. Yes?

**STUDENT:** Is it cool for the same sound to be heard audibly but with a different part of your mouth.

**NORVIN** Yes, yes, there are things like that. Do you have something in mind?

**RICHARDS:**

**STUDENT:** No.

**NORVIN** Oh, OK. So we haven't gotten yet to "r." We'll get to "r," eventually. But actually, people discovered at a certain point-- so people investigate this kind of thing in all kinds of ways.

**RICHARDS:**

One is the kind of thing for all doing, where we just sit and say, what is my mouth doing? Hmm. There's other kinds of work where people classically paint the roof of your mouth with stuff that will come off. And then you have people produce a sound.

And then you stick a camera in their mouth and take pictures and see which parts of the paint came off. You stick tubes down people's nose to measure airflow. You do all kinds of horrible invasive things.

These days, people do a lot of MRIs. I'm going to put on the website a couple of websites that have charts of all of the sounds that we're going to talk about plus many more together with MRIs of the insides of people's mouths making these sounds so that you can see the anatomy that's involved. You won't just have to think about it.

One of the things people have discovered as they're doing this kind of work is that people just have different ways of producing "r," that there are just different kinds of things you can do with your anatomy to make an "r" sound. And that's probably related to the fact that "r" is one of the kinds of sounds that people classically have trouble with. If you've been around small children, for example, it's standard for them to not quite get "r" right and to say something that sounds more like a "w" at a certain stage.

So I'm sorry. The short answer to your question is yes. And "r" might be an example.

Yeah. Good questions. Any other things we want to talk about? OK.

OK. So we went through that. OK. So now I already alluded to the fact that I had these slides that had various places of articulation on them.

But of course, each slide had multiple sounds on it. And so a place of articulation is obviously not the whole story. Here's another part of the story.

It's what's called voicing. So if you think about an "s" and a "z," those are both alveolar sounds. Your tongue is reaching toward the alveolar ridge.

But they're not the same. What's the difference between them? If you think about-- if you go back and forth between them, s, z, s, z, s, z, you can feel a buzzing.

[CHUCKLING]

And if you put your hand right here-- sorry, if you put your hand right here, right here on your throat, then when you make the "z" sound, you can find the source of that buzzing. It's right there in your larynx, yeah? What's happening when you make a "z" is that you're holding your vocal folds across the flow of air in such a way that they will flap in the breeze as the air goes by.

They'll vibrate, yeah? It's like whistling with a blade of grass, or playing a reed instrument, right? It's getting something to vibrate really fast.

And that's what you're hearing. That's that buzzing sound that you're hearing and feeling if you put your hand right here when you're doing a "z." We say that "z" is voiced and that "s" is voiceless. So it's a distinction in voicing. Yes?

**STUDENT:** Just the fact that [INAUDIBLE]?

**NORVIN RICHARDS:** Yeah, so the difference between "cats" and "dogs"-- yeah. So exactly. I was going to get to that later, but yes, that's exactly it.

So what's the difference between a cat and a dog? Well, as far as a phonologist is concerned, the difference is that "cat" and "dog" end in sounds that differ in voicing. Is "t" voiced or voiceless, the "t" at the end of "cat"?

Voiceless, yeah. And the "g" at the end of "dog" is voiced. And you're choosing "s" or "z." You're putting the sound that agrees in voicing with the consonant that's at the end. That's exactly right. Yeah?

**STUDENT:** So then is it possible to whisper "z"s and "g"s? Are they--

**NORVIN** Yeah. So this is a really good question which I was hoping not to get asked quite so soon. But no, that's good. OK.

**RICHARDS:** So she just asked, what are you doing when you're whispering?

So if you think about what you're doing when you're whispering, first of all, (WHISPERING) your vocal cords are not vibrating at all. (SPEAKING NORMALLY) Your vocal chords are not vibrating at all at any point, right? So that should mean that you're not making the distinction between "s" and "z," or between "f" and "v," or-- what's my other example here-- "th" [pronounced as in "thistle"] and "th" [pronounced as in "this"], right?

So the difference between "bath" and "bathe" is that the "th" [pronounced as in "this"] is voiced and the "th" [pronounced as in "thistle"] is voiceless, yeah? But that doesn't seem to be true, right? If you whisper "safe" and "save"-- (WHISPERING) "safe," "save"-- (SPEAKING NORMALLY) you have the feeling that you can hear the difference between them, yeah?

I think if you were to whisper one of these-- so do a controlled experiment. Go back to your dorm. Whisper to your dorm mate, (WHISPERING) "safe." (SPEAKING NORMALLY) And then find out what they think you said.

[CHUCKLING]

Maybe warn them in advance of what you're going to do. [LAUGHS] Oh, boy. The complaints. Yes.

So there's got to be something else going on, right? Let's do this experiment again, though. So it's easiest for you, actually, with "f" and "v." So let's do this thing again.

If we go back and forth between "f" and "v"-- f, v, f, v, f, v, which of them is voiced? The "v," right? The "v" is voiced.

OK. Now do it again, but whisper-- f, v, f, v, f, v, f. Does anybody feel a difference between "f" and "v"? Not here, right? Yeah?

**STUDENT:** I guess the "v" is more-- there's more air [INAUDIBLE]

**NORVIN** So yes?

**RICHARDS:**

**STUDENT:** Also, my mouth is opening slower, I think.

**NORVIN** Ah-- f, v, f, v. Yeah, there might be a difference in the aperture of your mouth. I think you're right.

**RICHARDS:**

And I think you're right, too, that there's a difference in how fast the air is flowing. For me, I actually have the opposite of your feeling. For me, f, v, f, v-- for me, there's more air when there's an "f" and less air when there's a "v." Yeah?

**STUDENT:** I don't have it with the "v," but when I say "v," my lips are a little narrower.

**NORVIN**

Ooh. F, v, f, v. Bah. Yeah. My jaw is moving as I do that.

**RICHARDS:**

And I think that is affecting what my lips are doing. They're coming together more. So I think what's happening may be-- maybe this is an attempt to answer your question-- is that so I just said sounds can be either voiced or voiceless. If they're voiced, what it means is that your vocal cords are vibrating.

And I made it sound like the way you do that is, well, you stick your vocal cords into the flow of air, right? And you make them vibrate. But I think maybe what we're learning is that you do some other things, too, to optimize the flow of air so that you will get a good vibration going, that maybe if the flow of air is too fast and maybe we're learning things about the aperture of your mouth as well, there's a way of making sure that the pressure that you're getting, the rush of air that you're getting on your vocal cords will make them vibrate in just the right way. And you're manipulating all of that stuff without thinking about it.

And you can still hear it when you whisper. So when you whisper, you're not engaging your vocal cords, but you're doing all the other stuff. And that's what you're using to hear the difference. There's experimental work on this. This is the kind of thing people try to figure out.

Yeah, really good question. OK. OK, so your vocal cords can either be vibrating or they can not be vibrating. So you have voiced sounds and you have voiceless sounds.

So "s" and "z" and "t" and "d" are all alveolar. But "s" and "t" are voiceless. And "z" and "d" are voiced. Does that all sound right?

Is anyone upset by any of that? Disturbed? Alarmed? Hungry?

Yeah, anything? OK, good. So it's back to the Polish plurals. So we saw before, we convinced ourselves, or I convinced myself-- and I tried to take the rest of you with me as collateral damage-- that Polish has words that end in "k" and words that end in "g" underlyingly.

But it also has a rule that changes "g" to "k" at the ends of words. That was Polish, right? OK, but it's not just "g."

So we can see some other pairs of words. I don't have any more minimal pairs for you. But you can see there's the same general tendency that if we look at singulars in Polish, that they can end in sounds like "k," or "b," or "t," or "s," right? That's what we're seeing in these pairs.

And when you pluralize them, some nouns that end in "p" still end in "p" when you add the "e," the suffix, like corpse. But some change the "p" to a "b," yeah? And the same deal for these other ones, right?

So what we're learning is it isn't just that "g" becomes "k" at the end of a word in Polish. There's this more general thing. What's the more general thing? What's going on here?

What's the difference between "g" and "k"? So they're both velar. Yeah?

**STUDENT:**

One's going to be voiced.

**NORVIN**

Yeah. Which one is voiced?

**RICHARDS:**



**STUDENT:** The "g."

**NORVIN**  
**RICHARDS:** The "g," yeah. So what's happening is that the "g," which was voiced, is becoming voiceless at the ends of words in Polish, yeah. What's happening with "b" and "p"? Joseph?

**STUDENT:** Voiced "b" becomes voiceless.

**NORVIN**  
**RICHARDS:** Yeah, the voiced "b" becomes the voiceless version, which is "p," yeah? Those are both bilabial sounds. They involve both your lips. Yeah. Yes?

**STUDENT:** How is "b" voiced?

**NORVIN**  
**RICHARDS:** Sorry?

**STUDENT:** How is "b" voiced?

**NORVIN**  
**RICHARDS:** How is "d" voiced? Oh, "b."

**STUDENT:** Yes.

**NORVIN**  
**RICHARDS:** "b." Buh. Buh. You're raising a good point. There's a reason that I started with sounds like "s" and "z," and "f" and "v."

Because you can go s, z, s, z for as long as you have, breath right? Whereas buh-- there's a limit to how long you can "b," yeah? We just said the way voicing works is that you've got air flowing across your vocal folds and making them vibrate, right?

And for a "z," you can see how that would work. So the air just flows. For a "b," well, the air only has so far to go, yeah? That's one reason you can't keep a "b" going for very long.

All that air-- it has to flow past your vocal folds to get them to vibrate a little bit. And then it gets to your mouth. And then it has to stop.

So there are other departments that are better at this than I am. But the air pressure in your mouth is going to build up past a certain point. You won't be able to keep doing that.

But you do it for as long as you can. That's the sense in which it's voiced. Yeah, good question. Yeah?

OK. So yeah, what's happening in Polish is not just "g" becomes "k." It's voiced sounds are becoming voiceless. So "z" becomes "s."

"d" becomes "t." "b" becomes "p." And "g" becomes "k," yeah? So it was sometimes called final devoicing. And it's a cross-linguistically quite common phenomenon.

OK. So yeah. All right. So we talked about place of articulation. And we've talked about voicing.

Now we need to talk about another dimension for categorizing sounds, which is called manner of articulation. So think about "s" and "t." They're both alveolar. And they're both voiceless.

But they're different from each other. And the way we distinguish them is via what we call manner of articulation. So they're both voiceless alveolar sounds, but "t" is a stop. And "s" is what's called a fricative.

So stops are also called plosives. I promise never ever to call them plosives. I will always call them stops because that's what I grew up calling them.

But you will sometimes see things written in which they're called plosives. In homeworks, if you ever need to write about them, feel free to call them either one. Doesn't matter.

I like calling them stops because they're named after the fact that, well, they stop the flow of air. That's what they do. That's what a stop is. And so the air is coming out of your lungs. And it gets stopped.

Fricatives like "s" are sounds in which you don't stop the flow of air, but you narrow some aperture enough to create turbulent air flow, which you hear as a hissing sound. So sounds like "s" and "sh" and "f" and "th"-- these are all fricatives, yeah? OK?

So for "t" and "d," the airflow is stopped. For "s" and "z," the airflow is restricted, but is not stopped. So you hold your tongue close to the alveolar ridge, but you allow air to keep flowing through.

This is the conversation we just had. That's why an "s," you can keep going for as long as you have breath in your lungs, whereas a "t," you can't keep executing it. OK. OK.

So now we have these three ways of categorizing these kinds of speech sounds-- place, and manner, and voicing. Place of articulation, manner of articulation, and voicing. So there are a bunch of places of articulation over there on the left.

And the sounds that we have mainly talked about have been either stops or fricatives. And then each of these places on the table-- there's a pair of sounds. And I hope I managed to do this right. Yes, it looks like I did. In all of these pairs, you've got both a voiced and a voiceless sound. Which one is first?

**STUDENT:** The voiced sound

**NORVIN RICHARDS:** The voiced sound, yeah. So in all of those, there's a pair. So you've got "zh" and "sh," for example, the postalveolar fricatives. And the "zh" is the voiced one. And the sh is the voiceless one.

Yeah? OK, good. All right, so now new class of sounds. This is a new manner of articulation.

So we've got "d," which is a voiced alveolar stop, and "z," which is a voiced alveolar fricative. And now we need to think about "n." Well, "n" is voiced-- nnnnn.

And it's a stop in the sense that you are stopping the air from flowing through your mouth. If you think about what's happening inside your mouth during an "n," your tongue is jammed against your alveolar ridge-- nnnnn-- just as it would be for a "t," So I love the sound of phonetics in the morning. It's great.

[CHUCKLING]

So when you're doing an "n," you've stopped the flow of air in your mouth. And so "n" is technically a stop, right? It's called a stop because there's no air coming out of your mouth.

But there's air coming out somewhere, right? It's coming out of your nose, yeah? "nnnn." And you can tell because if you hold your nose, [demonstrates] you will not be able to make an "n," yeah?

So the reason that you can keep an "n" going, again, for as long as you have breath, is, well, the air has someplace to go. It's going out your nose. What's happening when you make an "n" is that you are lowering the velum, which is this doohickey in the back of your mouth that partitions your nose from your mouth.

By lowering it, you're allowing air to flow through your nose. So for "t" and "d," the airflow is stopped at the alveolar ridge. For "n," the airflow is also stopped at the alveolar ridge. It can't go through the mouth.

It's stopped right there. But it goes through your nose. This is a nasal stop, a voiced alveolar nasal-- people often just call them nasals because nasal fricatives are messy.

Actually, not possible. Possibly. OK? So let me go back.

"n" is an alveolar nasal. What would a bilabial nasal sound like? "mmmm," yeah? That's an "m."

You close your lips and allow the air to flow through your nose. And a velar nasal? "nnnng." Remember that velar means the place of articulation for a "k" or a "g." So you make a "k" or a "g" sound-- kuh-- and then just let air flow through your nose-- "nnnn."

That's the sound at the end of a word like "song" or "king," making a velar nasal. Yeah? English doesn't allow words to begin with velar nasals. But there are languages that do.

So Tagalog, for example-- the word for now is [TAGALOG]. So it starts with a velar nasal. One of the entertaining things about learning Tagalog is learning how to make sounds that start with velar nasals. If you're an English speaker, you're not used to it.

Yeah? OK. So there there's the table again. So we've got stops and fricatives and nasals, nasal stops.

Things can be voiced or voiceless. And we've got all those places of articulation over there on the left. Are there questions about any of this? Is anybody looking at this and saying, whoa, this table has grown out of my ability to keep up? Yeah?

**STUDENT:** Question about the [INAUDIBLE].

**NORVIN** Yeah.

**RICHARDS:**

**STUDENT:** -- English doesn't allow?

**NORVIN** English doesn't allow words to begin with velar nasals. We don't have any words that start with a sound that's at the end of words like "song." We don't have words like [NON-ENGLISH].

**RICHARDS:**

English doesn't have words like that. There are plenty of languages that do. Tagalog is one. Cantonese is one.

There's a bunch of others. But English doesn't have that. Yes?

**STUDENT:** Well, I noticed there's not "j" in brackets for [INAUDIBLE] palatal?

**NORVIN** Oh, yeah.

**RICHARDS:**

**STUDENT:** Actually, I don't actually know where this "j" would go.

**NORVIN** Yeah. So we haven't yet gotten to the kind of sound that that "j"- the sound of the beginning of "year." You're  
**RICHARDS:** absolutely right. There's a gap there.

And I've put the palatal line there partly to get you to ask exactly that kind of question. So one of the points of this table-- it's like when the periodic table was first invented, I guess. So we have the system for categorizing sounds.

And now we get to look at it and say, well, wait. Why isn't there anything there or there? And what would it be like if it were there? We'll do a little bit of that in a second.

But yeah, you're right. So we haven't yet talked about the kind of sound that the IPA symbol "j"-- the sound we usually write with "y" in English, the sound of the beginning of "year"-- we haven't put that on the table yet. You're right. It's not a stop, right?

It's also not a fricative because you're not making any turbulence in the airflow. And it's not nasal. So it's another kind of thing. We'll get to it.

Good question. Other questions about this? OK, all right. So yeah, OK.

So this way of classifying sounds leads us to wonder about gaps. Yes. Thanks, Norman. Yeah, you set that up nicely.

So let's think about some of these gaps. So English, for example, has bilabial stops, "p" and "b." And it has a bilabial nasal, an "m." But it doesn't have a bilabial fricative.

What would a labial fricative sound like? Fh, fh, which sounds like blowing out a candle, right? Open your lips just enough to let some air come out and then blow.

**STUDENT:** [TRILLS]

**NORVIN** Ah, that's a bilabial trill. We will get to that. [LAUGHS] Either that or you were just having fun. I'm not sure.

**RICHARDS:**

There are languages that have that. OK. So bilabial fricative-- English doesn't have a bilabial fricative. But there are languages that do. Japanese does, for example.

So in Japanese, when people were writing Japanese in the Roman alphabet, when they write an "f," like when they write the name of this mountain, they'll write it with an "f." But in Japanese, that's not an "f." It's a bilabial fricative. It's "Fhuji," "Fhuji." If you learn Japanese, you must learn to pronounce the "f" bilabially rather than labiodentally.

So in English, we have a labiodental "f" with our lower lip against our teeth. In Japanese "f," your teeth are not involved. It is only your lips, yeah? Yeah?

What would a buh bilabial fricative sound like? Is this a voiced or a voiceless bilabial fricative?

**STUDENT:** Voiceless.

**NORVIN** Voiceless. Fh, fh. What would it sound like if it were voiced? Vh, vh.

**RICHARDS:**

And that exists, too. There are dialects of Spanish, for example, that have that between vowels, if you have the letter B between vowels in words like "abuela." That "b" has that sound-- a voiced bilabial fricative.

Moving across the chart, I've got a nasal stop there. Is that nasal voiced or voiceless? Voiced. "m." What would it sound like if it were voiceless? I should step back. [EXHALES SHARPLY]

Yeah, English doesn't have that. [EXHALES SHARPLY] But there are languages out there that do, languages like Hmong, for example, which is a minority language spoken in-- actually, it's quite a large minority language spoken in Vietnam. Hmong has that kind of sound. Tibetan has that kind of sound, too.

OK. Let's skip palatal and do velar. We've got velar stops in English-- "k" and "g," kuh and guh. And we've got velar nasals, nnnn. What would a velar fricative sound like?

Kh-- yes? She's alerting me that she's not just hissing at me. She's making a velar fricative. Yes. Kh, kh, right? Is that a voiced or a voiceless velar fricative?

**STUDENT:** Voiceless.

**NORVIN** Voiceless, yeah? Kh. Yeah? English doesn't have that.

**RICHARDS:**

But there are languages that do-- languages like German, say. That's one of the sounds that they write with the letters C and H at the end of composers' names, like Bach, right? Johann Sebastian Bach. His name ends with a velar fricative.

Russian has this sound, yeah? It shows up in the names of authors like Chekhov, that kh sound. What would a velar fricative sound like if it were voiced?

Lhg. Lhg. And English doesn't have that, either. But there are languages that do. Again, there are dialects of Spanish where if you have a "g" between vowels, it'll get this kind of sound, in words like "agua," yeah?

OK. So we've talked about various kinds of nasal stops. So an "m" is a bilabial nasal, where you close the flow of air at your lips and allow the air to flow through your nasal cavity by lowering your velum. So you get mmmmm.

Or you can stop the flow of air in other places. You can have an alveolar nasal, right? "n." You can have a velar nasal-- "ng." What would a glottal nasal sound like?

Trick question. You would need surgery. Yeah. So the way nasal stops work is you're stopping the flow of air somewhere in your vocal tract.

But you're allowing the air to flow through your nasal cavity, right? That's what a nasal stop is. Here, let's get back to one of these sagittal sections.

So that "n" there-- what you're doing is you're stopping the flow of air there at the alveolar ridge, right? But you're lowering the velum to let the air flow through. Or an "m"-- you'd be closing the flow of air at your lips and lowering your velum to let the air flow through. Or velar nasal, "ng," like at the end of "king," you're making a closure at the velum.

But you're also lowering the volume and letting the air flow through. A glottal nasal-- you'd have to stop the flow of air down there at the vocal folds and let the air go through your velum. But if you're stopping it down there, it can't be going through your velum.

So you would need, again, as I say, probably there are unethical surgeons who would modify you so that you could make glottal nasals. You'd need extra ways to get air to flow through your nasal cavity. I'm not recommending this, by the way.

OK. All right. Cool. So those are some of the gaps.

Oh, and I flagged a gap that I didn't talk about. Sorry, a couple of gaps. So English has interdental fricatives-- thuh and thuh.

And as I said, those are cross linguistically rare, which is why if you're trying to do an accent from various kinds of places, for example, in Europe, one of the things you do is replace your th sounds with other kinds of sounds. So if you're doing a French accent, you replace your "th" sounds with "z"s, right?

Or if you're doing a German accent, you replace your "th" sounds with "t"s, yeah? English has interdental fricatives. And it has alveolar stops, "t" and "d."

There are languages out there that have what are called dental stops. So the alveolar stop, again, involves your tongue touching the alveolar ridge and stopping the flow of air there. For a dental stop, your tongue is touching your teeth.

So you're not saying [NON-ENGLISH], you're saying [NON-ENGLISH]. English does not have those. But there are languages out there that do.

If you're studying another language, this is the kind of thing to think about because sometimes, your teacher will not be thinking about this. But you should be asking yourself, is this sound, the sound that sounds like a "t"-- is it an alveolar "t" or is it a dental "t"? Part of your job, if you're learning Tagalog, for example, is to learn to make dental "t"s instead of alveolar "t" because that's what they've got. Yeah?

**STUDENT:** If you're thinking about linguistic "t," but let's say someone doesn't--

**NORVIN** Have teeth? Yes. Yeah?

**RICHARDS:**

**STUDENT:** How would that work?

**NORVIN** Well--

**RICHARDS:**

**STUDENT:** Would it be a [INAUDIBLE]?

**NORVIN**

[LAUGHS] I believe that is what people do, yeah. So you make a closure. We can talk about interdental fricatives, right? So somebody who doesn't have teeth and wants to do a tuh-- what do they do?

**RICHARDS:**

I think their job is to create a turbulent airflow with their tongue between where their teeth would be if they only had teeth, right? And I think there's something similar going on with dental stops. But this is exactly the kind of thing that experimental phoneticists do is to try to figure out one of the things-- they do many things, some of them creepy, to try to figure out what's going on in your vocal tract exactly as you do this stuff.

There's all this work on what people do to compensate for various kinds of obstructions in the vocal tract. So you have people bite on a block. And you put something solid in their mouth. And then you're like, OK. So now what will you do with your tongue to make the sounds as best you can?

All kinds of weird stuff people do. Cool stuff. Yep. OK.

Where was I with all that? OK, yeah. So yeah, that's another set of IPA symbols. These are your first IPA diacritics, I guess, those little square doohickeys under the "t" and the "d" there.

Those indicate that that particular "t" and "d" those are dental. There are even languages out there that have both dental "t"s and alveolar "t"s. So the Dravidian languages of India are famous for having those.

And a lot of the Aboriginal languages of Australia are really rich in places of articulation. So is Dinka, come to think of it-- this Nilotic language that I mentioned briefly that has tone as a way of marking case. These are all languages that have lots and lots of places of articulation, including both dental and alveolar, but that often don't make the languages of Australia-- at least, often don't make voicing distinctions.

So they have stops, but they don't distinguish voiced from voiceless. So they have places of articulation and lots of them, and nasals in all those places as well, but no distinction between voiced and voiceless. Yeah. OK, any other questions about this chart before we zoom past it?

Like I say, on the website, there will be a link to charts that will look, hopefully, like this, more official charts by the IPA, which will have sound files so that you can listen to trained phonologists making the sounds. And also, at least one website, which I hope is still up, has MRIs so that you can watch the inside of a person's vocal tract as they make the sound. OK.

Now we have been talking about parts of the vocal tract that English uses. Sometimes, it doesn't use them for the same things. Other languages do. So we have teeth.

We use our teeth for interdentals, but we don't make dental stops. But there are places in the vocal tract that English just does not use. And yet other languages do. Here are a couple.

There are what are called retroflex sounds. These are sounds in which the tip of your tongue is on your palate. So instead of a tuh, you're making a cuh-- [NON-ENGLISH]. So your tongue is curled back a little bit further than it would be for a "t"

And it's making a closure, if you're making a stop, right there. So you can make stops there-- [NON-ENGLISH] or [NON-ENGLISH]. You can make fricatives there, like [NON-ENGLISH] or [NON-ENGLISH]. And you can make nasals there, like are [NON-ENGLISH], yeah?

Retroflex sounds are very popular in India, and Australia, and Indonesia. They're all over the place. Yeah?

**STUDENT:** Um, can there be-- there's a retroflex lateral, too, right?

**NORVIN** [NON-ENGLISH] Yeah, mm-hmm. Yeah. Well, we'll get to laterals, but yes. Yes, there is.

**RICHARDS:**

Yeah. Yeah. OK, those are retroflexes. Uvulars are kind of like "k" except more so. So for "k," your back of your tongue is hitting the back of your mouth.

It's touching your velum. That's a "k" sound-- [NON-ENGLISH]. For a uvular, your tongue goes further back. And it gets at or near your uvula, which is the little doohickey that hangs down there at the back. That's your uvula.

So this is a sound like [NON-ENGLISH], or [NON-ENGLISH], or [NON-ENGLISH], or [NON-ENGLISH], or [NON-ENGLISH]. These are all uvular sounds. We do not have these in English, at least when we're feeling well.

But there are languages out there the do. You're working on a problem set that involves the language Inupiaq. And that letter "k" is a symbol for a uvular stop. Inupiaq has a uvular stop.

It has one at the end of the name. The Inu at the beginning means people. And piaq is a suffix meaning something like real, or normal, or regular, right? So the Inupiaq are the normal people. The rest of us are abnormal, yeah.

So yeah. Uvulars-- reasonably popular. Let's see. They're all over the Indigenous languages of the Americas. They have them in Arabic.

Yeah, they're not exactly rare. But English does not have them. The uvular voiced fricative-- so the voiceless fricative, the "kh," "kh," is found, but not usually common in Europe. The "gh" "gh"-- the voiced uvular fricative-- is one of the ways to pronounce an "r" in languages like French and German, right? So if you're pronouncing the French word for "red," one of the ways to do it is with this fricative, to say "rouge"-- "rgh".

That "rgh" sound is a voiced uvular fricative. There are other ways. You can also do a uvular trill-- [TRILLS]-- where you get your uvula to flap in the breeze, but not everybody does that.

Yep. Questions about that? Accents? OK.

And then there are also pharyngeals. Pharyngeals involve constriction near the pharyngeal wall. Arabic has these. The Berber languages have these.

These are like, "ah, hah, ah, hah," or "ah, ah." You're getting the back of your tongue to get against the back of your vocal tract. Does anybody here speak Arabic? OK, so if you know anyone who speaks Arabic, get them to speak to you for a while and you'll get to hear them saying this.

As I say, there will be sound files where you'll get to hear people making these. So English doesn't have these. But there are languages that do.

There are pharyngeal fricatives. Those are both pharyngeal fricatives. OK, so slightly larger chart with more symbols on it, including some of the ones we've talked about-- pharyngeals, uvulars, retroflexes.

And for some reason, the dental stops are still red. I don't know why. Have to fix that. Yep.



This chart. OK. OK. Now people keep asking me about sounds that I've been carefully avoiding, so let's talk about them.

There are what are called approximants. Approximants are not stops, and they're not fricatives, and they're not nasals. They involve your articulators vaguely gesturing towards each other in some part of your vocal tract, not enough to make-- definitely not making contact, and not enough to cause any turbulence in the airflow.

So if you think about a "w," let's say, in the middle of a word like "away," that's not a stop. And it's not a fricative. And it's not nasal. It's bilabial.

You can feel your lips engaging as you make the "w" in the middle of "away." It's a bilabial sound. But it's not a bilabial stop or a fricative.

It is a bilabial approximant, yeah? All right. So similarly for the "y" sound at the beginning of "year" or "yard," and the "l" and the "r" at the beginning and end of, I don't know, "layer" or "rail," yeah?

Those are all approximants, yeah. They are sometimes divided into glides and liquids. And I'm hoping that nobody will ask me how you know whether something is a glide or a liquid. Are you about to ask me how you know whether something is a glide or a liquid?

[LAUGHTER]

Go ahead. Is that what you're--

**STUDENT:** Well, yeah.

**NORVIN RICHARDS:** Yes, OK. All right, fine. [LAUGHS] So a glide-- sometimes, it's as though a glide is an approximant that if you were to hold it longer, it would be a vowel.

So a "w"-- if you just freeze yourself in "w" space, you're making an "oo," right? A "w" is like an "oo" sped up. We're going to talk about vowels later.

But if you think about what an "oo" is, it's a held version of a "w." And similarly, a "y" sound, yuh, is a sped-up version of an "e" as opposed to an "r" or an "l," which are just something else. Because I have not given you a good way of distinguishing glides from liquids, you can trust me that I will never ask you to distinguish them in a way that will make a difference for grades or anything like that. You will never see me saying, no, you're wrong.

"That's not a glide. It's a liquid."-- I may say that. But there won't be minus 5 next to it. Yeah?

**STUDENT:** If the "w" and the "y" sounds are both just shortened vowel sounds, then why is it necessary to have these as separate symbols?

**NORVIN RICHARDS:** Yeah.

**STUDENT:** Just like the "ch" having two--

**NORVIN RICHARDS:** Having two letters. That's a really good question. So why don't we just use the letter "u" for the bilabial glide, for the "w"?

And let me see if I can come up with a good answer to that. Eventually, we're going to get to-- so far, all we're doing is talking about sounds individually. And eventually, we're going to start talking about sequences of sounds.

And we're going to want to be able to talk about restrictions on the ways in which sounds get to interact with each other. And so it's going to be useful, at that point, to be able to distinguish, for example, consonants from vowels. And once we do that-- and you should feel free to call me on this if it doesn't come up later. I'll try to make sure it does.

It'll turn out to be useful to be able to think of the consonant version of this sound, the "w," and also the vowel version of this sound, the "u." But you're right that there are plenty of sound changes where you see them converting back and forth between each other. That's a thing that happens, yeah.

So yeah. But that's the prima facie reason for distinguishing them because there are rules for the distribution of sounds for which it's useful to have that distinction. It's like anything else, I guess. We make that distinction as long as it turns out to be useful for explaining stuff.

Yeah. Good question. Yeah? Good, all right.

So those are glides and liquids, OK. And then I recall we were asking about this before. Sounds like chuh and juh-- I think I said you could think of chuh as a stop, a "t" followed by a fricative, shuh, or juh-- the juh at the beginning and end of a word like judge as being a stop, a "d" sound followed by a fricative, a zhuh. There's a little bit of a debate about whether what I just said is the right way to think about this or not.

I think the standard way to think about it is not exactly that. What people do is say, yeah, there's this package deal, an affricate. So there's a name for this kind of thing. An affricate is this sequence, something like a stop followed by a fricative. And the arguments about whether or not to make this move, about whether to say, no, that's a single sound with a complex motion as opposed to saying, no, that's two sounds right next to each other has to do with the kinds of considerations I was just talking about.

When you're trying to figure out-- what's the best theory of, for example, what sequences of sounds are allowed in a syllable in a given language-- sometimes it's useful to be able to say this is a language that doesn't ever, ever allow, say, a syllable to end with a stop followed by a fricative. Oh, but it's OK for it to end with chuh. So we'll just treat that as a single package, right?

We won't treat it as a stop followed by a fricative. That's the move people make, yeah. So terminology. OK?

All right. So I've made the table whiter. There are glides like wuh and yuh. There are some other glides there which I can try to read to you. What would a labiodental glide sound like?

What's a labiodental fricative, a voiced labiodental fricative? Vuh, right? Like a "v" sound.

So can you try to make a labiodental glide maybe between vowels? It's going to be something like [NON-ENGLISH]. English doesn't have those. I believe Hindi does. So there are languages out there that have labiodental glides.

Similarly, there are velar glides, [NON-ENGLISH], where your tongue is just vaguely gesturing in the direction of your velum, yeah? I like the IPA symbol for the velar glide. It looks like something out of Tolkien.

Yeah. OK. All right. So we've done consonants.

We have not done all the consonants. So what I'm going to do is show you some vowels. And then we'll circle back and look at some particularly exotic consonants probably next time, probably not today.

So I want to start talking about vowels. So let's go through the vowels systematically. Compare the vowel in the middle of bead and the vowel in the middle of bad.

And here let me just warn you that the IPA becomes particularly forbidding when we get to vowels in English. And it's not the fault of the IPA. It's the fact that English has a very large number of vowels and a not-very-good system for writing them.

This is one of the things that makes English spelling so difficult that we can actually have competitions where you watch people spell. This is a thing that in many languages would be impossible. If you tried to do that in Finnish, the spelling bee would just never end because every word is pronounced exactly the way it's spelled.

We don't do that in English. So here are two vowels. And those are their IPA symbols.

The vowel in "bead" and the vowel in "bad"-- and now so everybody joined me in transitioning from one of those vowels to the other. Go ee-ah, ee-ah, ee-ah, OK.

[LAUGHTER]

You guys sound good. What are you doing? You're doing what I asked you to, but what's happening in your mouth? Yes?

**STUDENT:** The second vowel is open.

**NORVIN RICHARDS:** Yeah, the second level is more open. You're opening your mouth a little bit more. What are you doing with your tongue?

**STUDENT:** Releasing from the top of your mouth.

**NORVIN RICHARDS:** Yeah, it's lowering. It's going from the top to the bottom. Yeah, I think you guys are both right. So for "ee," your tongue is tense. And it's up there at the top of your mouth.

And then for "ah," your tongue drops, right? And in fact, it drops so far that it drags your jaw down with it, right? Maybe there's a more reasonable way to say that.

You lower your jaw so that your tongue can go even further down. Yeah? So one way of classifying vowels is in terms of height. So we talk about the high vowel, like "heat," and the low vowel, like "hat."

And there are vowels in-between, like the vowel in "hate." That vowel is called mid. So we have high vowels and we have mid vowels. And then we have low vowels.

Yeah. OK. Now let's do another comparison. Think about the vowel in "he" and the vowel in "who." So everybody go ee, ooh, ee, ooh, ee, ooh. What's going on in your vocal tract as you do that?

What's the difference between "ee" and "ooh"?

**STUDENT:** Your lips?

**NORVIN** Your lips. Your lips are definitely involved. Yes. So for "ooh," they're like this, right? Your lips are rounded.

**RICHARDS:**

For the "ooh," that's absolutely right. Yeah. And then for "heat," they're not. Yeah?

In fact, that's why when you take photographs of people, you have them say something with an "ee" vowel in it, like "cheese," just to get them to not round their lips. But you're doing something with your tongue, too, as you go from "ee" to "ooh," ee, ooh. What are you doing with your tongue? Yes?

**STUDENT:** Moving it forward [INAUDIBLE]?

**NORVIN** Wow. So let's start with "ee." Where is your tongue? It's in your mouth, but where is it pointing?

**RICHARDS:**

It's high, right? "Ee." And then for "ooh," where does it go?

It moves, right? So you aren't just rounding your lips and leaving your tongue where it was. Yes?

**STUDENT:** I noticed for "ee," my tongue is also between my molars.

**NORVIN** Yeah. Ah, yeah. I see what you mean. Yeah, yeah.

**RICHARDS:**

I don't know about you guys. But for me, for "ee"-- yeah? Yeah, for me, for "ee," it's at the front. And it's high.

And then for "ooh," my tongue curls backward. And it avoids my molars. You're absolutely right.

And it curls backwards so that it's hiding back in the back of my mouth. I think that's the thing you were saying just now. Yeah?

Is that the experience people are having? Everybody do some more ee, ooh, ee, ooh. Feel your tongue moving back and forth. Ignore your lips, right? And think about your tongue.

Yep. Yep. OK, so we have high, mid, and low vowels. But we also have front and back vowels.

So the back vowels are vowels like the vowel in "who" and the vowel in "hoed," and the vowel in "hot," "ah." So "ooh" and "oh" and "ah"-- those are all back vowels. Your tongue is pulling back toward the back of your mouth. Yeah.

OK. And then this is the other point that you guys made. Some of these vowels are rounded. So in English, the back non-low vowels, the back high and the back mid vowels, are rounded in who and hoe. Your lips have to round to make those vowels.

But for hot, your lips don't round. Yeah. And a bunch more symbols. Some of them aren't so bad.

The letter "u" for "ooh"-- that's pretty good. And the letter "o" for "oh," yeah. And then we have that ash symbol there, which is from Old English for "ah" in "had." And then "i" and "e" and "a," stuck with those.

Yeah? We have standard-issue European values for some of those symptoms, OK? Now in this chart, I've only got six vowels. You may have been taught-- how many vowels were you taught English had if you went to school in English? Yeah?

**STUDENT:** Five.

**NORVIN** Five. It's supposed to have five, right? It does not have five. It has 14.

**RICHARDS:**

And why are we taught that it only has five? Why do we only have five letters for vowels? Who gave us this alphabet?

The Romans, right? Yeah. And in Latin, there in fact are five vowels, which can be either long or short. So this is a perfect alphabet for Latin, yeah?

But then we got hold of it. And so we've ended up with 12, 14 vowels. Different dialects of English are different. And we have five letters to spell them with. And this is why we have spelling bees, yeah-- one of the reasons.

OK, so I've written six of our five vowels here on this chart. And then we have more. So think about "ooh" and "uh," in "who'd" and "hood," or "ee" and "ih" in "heed" and "hid," or "ay" and "eh" in "raid" and "red," or "oh" and "aw" like in "coat" and "caught." There are various ways of talking about this distinction.

But one way is like this. We say that there's a distinction between what are called tense vowels and what are called lax vowels. So "ooh" is a high back rounded tense vowel.

And if you go back and forth between "ooh" and "uh," ooh, uh, ooh, uh, ooh, uh, the idea is basically what you're doing is relaxing. So your tongue is not quite as rigidly high and back as it would be for an "ooh" when it makes an "uh." And your lips are probably not quite as tensely rounded, either.

Your whole body relaxes, yeah? Same deal with all these other pairs. It's a fact about English lax vowels that there's a restriction on their distribution.

English monosyllables don't end in lax vowels that are either front or high. So we have words like "flee" and "flu" and "flay." Those are all words in English. "Flay" means to remove the skin from.

But we don't have those three words at the end there. I've given them stars to remind us that those are not words that we could have in English. Anybody want to attempt to pronounce them? Yeah.

**STUDENT:** Wait, which ones-- I was going to ask a question.

**NORVIN** Oh, sorry. You were going to ask a question. Go ahead.

**RICHARDS:**

**STUDENT:** What about schwa?

**NORVIN** We haven't gotten to schwa.

**RICHARDS:**

**STUDENT:** OK.

**NORVIN** Yeah, yeah. There are more vowels. Yeah. Those last three-- if they were English words, they would be "flih,"  
**RICHARDS:** "fluh," and "fleh," right? Well, we don't have words like that.

English doesn't have words that end in "ih," or "uh," or "eh," with the possible exception of "meh." So if we don't count that as a word, then English doesn't have monosyllables that end in these vowels, yeah. OK.

And then you wanted to know about schwa. Those are sometimes called central vowels. Sorry, the first vowel in "machine" is a schwa. It's not higher back. It's not front.

It's not high or low. It's mid and central. And then "dove" [the bird] is pretty similar to schwa and is sometimes represented with that wedge shape there. In fact, it's called a wedge.

Not all speakers of English distinguish schwa from wedge. I do. So for me, the vowels in above are two different vowels-- above. But there are speakers of English for whom they're the same.

Similarly, let me go back to an earlier slide, not every dialect of English has all of these vowels or has them all in the same places. So I speak a dialect of English in which "caught" and "cot" are different, have different vowels in them. Does anybody pronounce those words the same? Yeah?

**STUDENT:** I pronounce them the same. But I have a question. You said that they can't-- English monosyllables can't end in lax vowels. What about "law"? I know that ends in--

**NORVIN** Yeah.  
**RICHARDS:**

**STUDENT:** [INAUDIBLE]

**NORVIN** Yeah, yeah, yeah. So what did I say? They can't end in lax vowels that are either front or high.  
**RICHARDS:**

**STUDENT:** Oh.

**NORVIN** So yeah, you're absolutely right. There are ones ending in "aw," like "law." Yeah, absolutely. Or "flaw."  
**RICHARDS:**

There are people who pronounce "caught" and "cot" the same. For me, those are two different vowels. Yeah, can you pronounce them for us?

**STUDENT:** "Caught" and "cot." [pronounced identically]

**NORVIN** OK, cool. Did you say them in the same order or a different order?  
**RICHARDS:**

**STUDENT:** It didn't matter.

**NORVIN** It doesn't matter. OK, good.  
**RICHARDS:**

[LAUGHTER]

I pronounce those three words-- "merry," "marry," and "Mary"-- I pronounce them the same. There are dialects of English that have different pronunciations for some of them. Does anybody pronounce these words differently? Yeah?

**STUDENT:** "Merry," "marry," and "Mary."

**NORVIN**  
**RICHARDS:** Mary, yeah. So there are people for whom the vowel in the last one is more of an ash. It's like a "Mary." I associate that with New Jersey, where-- you're from New Jersey. Yeah, yes.

I'll pay you later. OK, yeah. So OK, we've now rocketed through a bunch of consonants and vowels. We're just about out of time. Let me just give this to you as an exercise. And then we'll stop. Anybody want to try to pronounce the first of those?

**STUDENT:** Sells.

**STUDENT:** Oh, "She sells seashells."

**NORVIN**  
**RICHARDS:** "She sells seashells." Yeah. I'll tell you what. We'll do this exercise next time.

So next time, we'll do this as the first slide. And I'll leave it on the slides. You can work on it at home and do some fooling with it and try to get to where you can read it.

As we go along, I'm going to be asking you to read things in IPA. So I'll start putting IPA on the slides more and more. So start trying to familiarize yourself with it and get to where you're familiar with at least the symbols for sounds that we use in English.

Do you want me to read the rest of them? I'll do some more IPA. OK, so what's the second one?

**STUDENT:** "Sue says he's a bad egg."

**NORVIN**  
**RICHARDS:** "Sue says he's a bad egg." Yeah, you guys are fast learners. And what's the third one?

**STUDENT:** [INAUDIBLE]

**NORVIN**  
**RICHARDS:** Excellent. And what's the last one?

**STUDENT:** "Top chopstick shops stock top chopsticks."

**NORVIN**  
**RICHARDS:** Yeah. "Top chopstick shops stock top chopsticks." Got that from a book of tongue twisters. OK, good. So let's leave it there. And we'll come back to this next time.