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Chapter 1: Anatomy and Physiology of the Speech Mechanism & Features of the Human Body

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CHAPTER 1: ANATOMY AND PHYSIOLOGY OF THE SPEECH MECHANISM & FEATURES OF THE HUMAN BODY

LIV BAKER

Learning Objectives

After reading this you will be able to:

1. Understand the basics of speech production and how it relates to the human body.
2. Contrast the various aspects of speech production

INTRODUCTION

The Respiratory System and Phonation

The respiratory system consists of organs that function to expel carbon dioxide from the body through exhalation. It accomplishes this by taking in oxygen through the process of inhalation. **Respiration** is, simply, breathing.

THE IMPORTANCE OF SPEECH

We talk to communicate, to feel less alone. Our bodies were designed for this. Our speech is an important aspect of who we are. There are people who spit words, who strike them like matches against our wrists. There are people who put us back together, who slowly stack our limbs upon each other with a few simple words. There are those who say nothing. There are those who say too much. In special cases—such as my father—there are those who let you speak, then act as if you never said a thing.

PORTIONS OF THE SPEECH MECHANISM & FEATURES OF THE HUMAN BODY

THE TONGUE

The tongue is the major articulator in phonation. Some sounds produced by the tongue are /t/ and /g/. It is active and composed of muscle. Without it, speech production cannot occur. To reference: in medieval times, tongues were removed from those who betrayed the royal family and, as a result, these individuals became known as ‘mutes’ because they could no longer speak.

Example 1.1

I ran cross country and track in high school. Every day, I would come home around 5 pm, eat, shower, do my homework, and sleep. My father would come home at 6:30 p.m. on his late nights and eat dinner with my mother.

One night, my mother made spaghetti. I watched as she spooned dry noodles onto a plate, sloshed it with red sauce, sprinkled it with parmesan. The counters were covered in tiny chiggered flecks. She quickly wiped them up before retiring to the den to read. I ate my dinner in my room, watched Netflix, then brought my plate to the kitchen. I needed to refill my water bottle, too.

I didn't hear them yelling when I first walked in. In fact, everything seemed normal. My father was sitting across from my mother, eating a full plate of spaghetti. He emptied onto the table a tube of **Labello** chapstick and the two polished stones I gave him as a child. His chapstick was for kissing—kissing employees (platonically), the wives of his friends (platonically), probably his dry-cleaning lady (platonically), and my mother (platonically). I washed my plate slowly, careful so as not to stain my sweatshirt sleeves with spaghetti flecks.

Then he raised his voice. I refilled my water at the fridge. I watched it happen. It felt tactful, plotted. I saw the spaghetti flecks appear on my mother's cheeks, land on the yellow placemats. I saw his eyes. Two black-olived chasms. He did not see mine. At age fifteen, I was mute.

To practice: Repeat to yourself: “there is good” three times. Notice how the tongue moves as you produce the /t/ and /g/ sound.

THE TEETH

The role of the teeth in phonation is more important than one might imagine. The teeth provide an important place of articulation for the tongue and the lips. They work together seamlessly and quickly to produce sound. Without teeth, we cannot speak.

Example 1.2

My mother was very **sick** as a child. She sat in netted tents while her friends went to school and ate chocolate ice cream. Tetracycline ate away at her white marbled teeth. But, later on, she married a dentist. Dentists have power. My father once accidentally drilled a hole through her tongue. She could not speak for weeks. When he created a new smile for her, he added beautiful veneers. They were large—almost too large—but she had beautiful teeth. Nearly twenty years later, her new dentist told her one tooth was filled with rot that this tiny, marbled capsule was crumbling from within, that it had been for twenty years. Even now, my father takes away her ability to speak.

To practice: Say “it was an accident” and notice when your tongue touches your teeth. Now, try to say it without touching your teeth.

BLOOD

Blood constantly circulates throughout our bodies. It keeps us alive. It has its own system. It has its own cancer, too. Multiple myeloma is cancer of the blood plasma, or white blood cells. Plasma cells live within bone marrow. The blood plasma grows cancerous and spreads throughout the body. Symptoms are not always present and can go unnoticed for eight years.

Example 1.3

In late September of my sophomore year of college, my father called me. He was moribund. *Final stage multiple myeloma*. He said he was promised three months.

There was **space** between us. I felt guilty. I festered knowing that he ate microwaveable meals alone, knowing that he slept in an empty home, knowing that he could die alone. I festered and I wallowed and I wept. We had not truly spoken in months because he did not try. He did not deplore it, either. I did. Was he supposed to now? At this time, he lived alone. I was going to have to dropout of school at nineteen to tend to a dying man I was not sure loved me most days. It’s what you do for your parents, right?

The following week, he announced his engagement. He said that he had proposed over lobster in **Massachusetts** while her granddaughter played on the floor between them. He didn’t need me anymore. She was oddly cheery; wore a lot of white turtlenecks, Levi jeans; a sensible woman with a sensible tennis shoe collection; drank wine solely at Church; cooked colossal amounts of spaghetti; overly buttered everything (when she knew I couldn’t eat it); obsessed over Christmas ornaments. There is

blood between the two of them now.

To practice: Look at the purpled veins on your wrists. Think about the miraculality of living.

THE LIPS

The purpose of the lips is to open and close accordingly to create speech. They are also used for kissing. When producing English phonemes, the lips help to create varying sounds like /p, b, m/. These sounds are called *bilabial sounds* because they involve using both the upper and lower lips.

Example 1.4

When I first heard my father was dying, I hid under the desk in my apartment; just like you would if you were expecting an earthquake, or a hurricane, maybe. I could not remember the last time I laughed with him. I could not remember what he felt like when I hugged him. I hid under the table because I could not breathe outside of it. I disappeared for twenty-four hours. My head pounded so hard I could not see.

As my father decayed, I did not eat, I did not sleep, I did not speak. My lips never parted. Moving was difficult. I wore sunglasses. My body was a bundle of nerves that implored satiation, exertion, eyeliner.

In October, I went home a lot. The leaves changed and caught fire and died and fell to the ground and my father continued his chemo. At home, we drank pressed green juice and ate spaghetti. My mother made homemade chicken broth for my father. She thought it was a kind gesture. He never touched it. It soon grew too cold to walk outside. October was red and gray matter.

By Christmas, my father was nearly **anamorphic**. Skin hung from him like chicken boiled for broth. He was falling right off the bone. His own body rebelled against him—sucked cooked marrow from his holed osseous matter. Maggots decayed his pale salmoned tongue. He moved with steel rods in his spine. Clouded eyes beaded from two deeply sunken sockets like craters on the moon. His speech was a dry sputter; the sound of water first rushing through old pipes.

To practice: Bite your lip, wait for the coppered penny taste.

THE VOCAL FOLDS

The vocal folds, or vocal cords, are one of the main portions of producing sound. They vibrate together in various ways to determine the pitch of sounds. Based upon the vibration of these vocal folds, a sound may be **voiced** or **voiceless**. However, when we produce voiceless sounds such as /h/, we can still understand them in production.

Example 1.5

We are also capable of loving voiceless things, things that cannot speak, that do not breathe. My goldfish died this morning: he floated up from beneath his pineapple cave, his eyes still clear, his body still fresh and vibrant. There was no warning that my little fish would die. I woke up today and he was gone. I flushed him down the toilet—a proper funeral.

To practice: Say aloud: “Had I known that he was dying, what would I have done differently?” Notice how the /h/ sound is still understood, even though it was produced voicelessly.

THE GLOTTIS

The feeling of a lump in your throat is caused by your autonomic nervous system being triggered by stress. As a result, your body works to expand your ability to receive oxygen—therefore, opening your **glottis**. This allows for more oxygen to enter your lungs. However, when you feel that lump in your throat, it is often because we feel like we are about to cry. To suppress crying, we constrict the glottis in an attempt to stop breathing so intensely. There is an internal conflict going on as we open and constrict the glottis simultaneously. As a result, when we swallow, we feel like we are swallowing a lump in our throats.

Example 1.6

Nearly a year later, my grandmother passed away. I received an invitation via text message from my father for a **graveside burial**. He forgot to tell me she was sick. He forgot to tell my brother she had died. There was no visitation, no funeral, no closure, just her and a shovelful of dirt. The last time that I saw her she was riding passenger in the front of a small car. We were never close. We went for sushi.

The weekend of the burial, I drove home two and half hours for the forty-minute ceremony. I honored my grandmother. I wore thick-rimmed sunglasses. I had breakfast. I buried her. I stopped at Salvation Army on the way home. I went for lunch. The sun was not shining. I did not think about the phone calls she never returned. I did not think of the distance. I knew that she loved me.

On the day of the burial, my father asked me how my car was running. He had put on weight; his hair had grayed. There was color washing away in his cheeks. His physicality astounded me. He thanked me for coming. He told me he wished that she and I could have been closer; he said it like there was a chance we still could be. What he did not say was that he was still alive, despite it all.

At the burial, I stood behind four green velvet chairs. I could not distinguish which side of the coffin contained her feet and which contained her head. It was a sick magic trick; I waited for her to be sawed in half.

Staring at a bronze-glossed coffin gives the impression that anyone could be inside. If I did not think too hard, I was not sure it was not my father. However, the coffin was too short for him. On top of it,

there was an oddly-shaped bouquet of flowers and a twenty-four-square-foot pile of dirt next to us. It was raining.

I tried to picture her inside her bronzed, burnished chamber with tired adamantine arms folded cold across her chest; two tarred lungs deflated like crushed cigarette cartons; her abbreviated, anorexic-blond hair; two pebbled, brunette, boring eyes veiled by folds of wrinkles; on her wrists, several golden Egyptian-esque bangles. She was beauty worn down by dereliction, determination, distress. Was she the kind of woman to wear heels?

As they lowered her into the ground, I spoke with a woman from the funeral home about my school and my friends. I told her my father and I were never close, that my grandmother and I were not either. I tried to not think about the inevitable: that the next time I attend a funeral it will be his. My father took pictures of my grandmother's coffin five feet below, resting beneath a layer of **peach-colored stone** with a cross on top. I took note to remember to do that to him, too. Two shovelfuls of dirt and a bouquet of white daisies kissed her goodbye.

If I think hard enough, I can hear her laugh, an expulsion of air—a release of pressure. The lump in my throat grows, still.

To practice: Read something sad. Wait for the lump.

THE LUNGS

The lungs are the driving energy force for the production of speech. Without the lungs, sound production would be impossible. This results from the pressure system within them. Without pressure built up, the vocal folds cannot move or vibrate to produce sound.

Example 1.7

Several mornings after the last fight with my father, I wake up and cannot breathe. At urgent care, they ask me questions:

What is your father's marital status? *Married.*

What insurance plan does your father have? *One for cancer and one from the government.*

Can I see your insurance card? *Yes.*

What is your father's address? *I do not know.*

What is your father's wife's name? *I do not know her last name.*

Is your father's wife part of his insurance plan? *I think so.*

Can you breathe? *No, stop asking me questions.*

The first room they take me back to is white-walled and sterile. The sanitary paper on the chair crinkles under pressure. There are no windows. There are three large monitors. Twelve pens in one cup. One jar of cotton balls. One jar of Q-tips. The nurse in flowered scrubs asks me what is wrong. In-between breaths I tell her I cannot breathe. She asks me if asthma has always been a problem for me. I tell her no, not since I was a little kid. She takes my blood pressure. She asks me how tall I am. The next room they take me to is larger. There are two doctors now. One is up my shirt, cold metallic hands pressing on my back and chest. I inhale. I exhale. They give me medicine. It makes me high. The fluorescent lights beam down on me. They reflect off the orange walls. All I see is mechanical sunshine. I text my father to tell him about the charge to his insurance. I tell him I'm having another asthma attack. He asks me what I did. I tell him asthma is not something I can control. I tell him the reason he is a bad father is because he doesn't care about how I am, that he blames me for everything. The vasodilators are rushing to my head.

When I get home, I lose my voice. *He is taking my voice from me again.* The doctor said that this can be a side-effect of the medicine. I cannot breathe, I cannot speak, but I can sleep. I wake up every four hours. Take a pill. Go back to sleep. I sleep through the day, through my father's texts, my mother's calls. I sleep and I sleep and I sleep. When I wake, I still cannot speak.

My mom says that asthma attacks happen when the victim feels unloved or abandoned by someone. She says that the fear of abandonment grows so strong, the victim of the attack nearly strangles themselves.

To practice: Hold your breath for as long as possible. Inhale for one second. Inhale again, but for a little less than a second. This is what asthma feels like, but the seconds keep growing shorter and shorter.

Learning Objectives

After reading this section are you able to:

1. Receive the various anatomical portions of speech production and their relation to the human body?
2. Contrast the various uses of speech production?

GLOSSARY

anamorphic - being distorted; the state parents are never expected to be in

glottis - the space between the vocal folds

graveside burial - some family/friends and a coffin, no funeral, no visitation

labello - gooey German chapstick

Massachusetts - the state with the big question mark

Multiple Myeloma - cancer of the blood plasma

peach colored stone - something like a Sarcophagus

phonation - the production of sound

respiration - inspiration and expiration

sick - my mother was allergic to nearly everything (eggs, chocolate, shellfish, dust, tree nuts) and, as a result, spent most of her childhood drugged on antibiotics in bed

space - often a form of protection between two people

voiced - a category of sound that is heard

voiceless - a category of sound that is produced, but not heard, unless combined with other voiced phonemes