CD 2, Track 24
Chapter 4: Listening
Omega-3 and the Brain

Narrator: Listen to a lecture in a nutrition class.

Professor: All right. Omega-3 fatty acids, and specifically DHA, play a major role in facilitating the transmission of signals in the brain. What happens is that DHA makes it easier for electrical signals to travel across the synapses between two different neurons or brain cells. So what I'm saying here is that just like a well-oiled machine, your brain needs fat to make it work more efficiently. And…without enough DHA, brain communication can actually break down. And of course, that is the last thing we need especially with mid-terms coming up!

So, you may be asking yourself, what are the nutritional sources of omega-3 fatty acids? Well, they're found in egg yolks, tofu and walnuts. But by far the best source is cold-water fish such as salmon, cod… and herring. So fish is what we might call brain food. Some scientists even go so far as to hypothesize that the homo sapiens brain evolved as a direct result of our ancestors living near…in close proximity to the sea where there was a whole lot of marine life available. As a matter of fact, fossil records indicate that brain capacity actually doubled with the evolution of homo erectus to homo sapiens. And this increase in cranial capacity was limited to those who lived in coastal or marine environments. Hey, I know what I'm having for dinner!

CD 2, Track 25
Chapter 4: Listening
Conversation

Narrator: Listen to a student talking to a library clerk.

Student: Hi. Would it be possible to book a room—a study room for next Thursday?

Library Clerk: Can I see your student ID?

Student: Oh sure, yeah, uh-huh. Here you go.

Library Clerk: Let me check…yes we have room 128. It's available all day. And you are aware that we require a minimum of three students to confirm the booking, right?

Student: Yeah, that'll work. There are four of us, practicing our presentation for neurobiology class. So, can we come in from 1 pm to 5 pm, let's say?

Library Clerk: How about between 1:00 pm and 4:00 pm? Only profs have the authority to book for more than three hours.

Student: Yeah, so three hours, huh? Actually, we're going to need a digital projector and a laptop. Do the rooms come equipped or …

Library Clerk: No. Actually, you have to reserve here and then pick up the equipment at the circulation desk.

Student: Okay, so if you could book a digital projector and a laptop then.

Library Clerk: Alright. And just so you know, you'll need to arrive on time.

Student: Right.

Library Clerk: Cause we make the rooms available for new bookings if students are more than ten minutes late.

Student: So you mean that we can just show up and book a room on the spot if we want?

Library Clerk: Yes, but I wouldn't recommend it. I mean, the study rooms are in fairly high demand these days.

Student: Okay. Thanks for all your help. See you Thursday.

Library Clerk: And don't forget: no food or drinks in the study rooms.

Student: Right.

Library Clerk: And leave the room in the same condition you found it and… Oh, and did I mention you can now book rooms online? I mean, you know that might save us both a lot of time and trouble—you know what I'm saying.

CD 2, Track 26
Chapter 4: Listening
Conversation

Narrator: Listen to a student discussing a problem with her academic advisor.

Advisor: Hi Isabel. What can I do for you today?

Student: Well, I came to see you because…I'm confused. I mean I'm not really sure what to do.

Advisor: Problem with a course?

Student: Well, not exactly. I mean the fact is…is that I've been really getting into some of my required Psych courses like Intro to Brain and Behavior. And then Cognitive Neuroscience is really awesome. But it's just that I spend all my time on those. And I don't know why, but like I've totally lost interest in my regular Psych classes.

Advisor: Well…have you considered a change in major?

Student: Yeah… I mean, I've thought of it, but it's just that I don't know if at this point I can switch to Sciences. And then there's losing credit for the courses I've already taken and all that. But…somehow I don't even care because my interests have shifted. And I know, you know, that this is what I want to do—like not, psychology, but neuroscience.

Advisor: Well, that's not as dramatic a change as you might think, Isabel. I mean, there are a lot of psych majors who have opted into our new program.

Student: New program?

Advisor: Yes, well, with the large amount of brain research these days, the university has actually opened up a new program. It's a joint venture between the Biology or should I say the Biological Sciences and the Psychology departments. So it's called Cognitive Neuroscience Specialty Degrees. And you can take it in either the faculty of Arts or Science. And they do have one option which includes a cognitive neuroscience major and a psychology minor. That might work to your advantage.

Student: Oh, that sounds interesting! So, you mean I could apply my Psych courses to the minor and therefore not lose any time in completing my degree?

Advisor: Well, since you are only in your first year and because from what you are telling me, you may've taken some of the required courses in Cognitive Neuroscience already—I mean you mentioned Introduction to the Brain and Behavior and Cognitive Neuroscience. Well, these courses could actually be applied to your new major. And the Psych requirements you've already completed could be counted for your minor.

Student: What, whoa—that's fantastic news! I mean, I had no idea about the new program. So, you know I—I think I'm going to go for it. It sounds perfect for the direction I want to take.

Advisor: Yes, but remember, we are going to have to look at the requirements for the Cognitive Neuroscience major and Psych minor in specific detail just to make sure you can transfer the courses you've already taken. What I'm saying is that you may have to make up one or two courses in the summer.

Student: Yeah, I can do that.

Advisor: And of course don't forget that the deadline for fall semester registration in the new major has to be completed by the end of February.

Student: Oh—that doesn't give us much time.

Advisor: Look, why don't we schedule another appointment for Friday? No, let's make that… Thursday at 2 pm. And then we can work out all the details and fill in the necessary forms.

Student: Great—that's awesome. Thanks so much.

Advisor: Okay. See you Thursday at two.

CD 2, Track 27
Chapter 4: Listening
Exercise and Cognition

Narrator: Listen to a discussion in a kinesiology class. The professor is discussing exercise and cognition.

Professor: So…we're continuing our discussion about exercise and cognition and a number of you have prepared summaries of particularly relevant studies. Sarah, let's start with you.

Student 1: Well…my study involves these school-aged children in Illinois, and in the study students were measured for body mass, you know, the body mass index, and then they participated in this intensive cardiovascular regime…brisk runs, sit-ups, push-ups to determine their fitness level. And then they were assessed using a standardized test in both math and reading. And so what the results showed was that the fittest students were actually the ones who scored the highest.

Student 2: So, you're saying that higher fitness levels equal better scores in math and reading? How is that possible? I mean, what's the science behind it?

Professor: Good question, Sam. So, what we're looking at here is a process that begins every time you move a muscle. Like, for example, when you contract and release a bicep, this protein, a protein called IFG-1 is released into the bloodstream and then goes directly to the brain. And at this point IFG-1 begins its work in increasing the production of a critical brain chemical called BDNF, or brain-derived neurotrophic factor.

Student 2: So BDNF, why is it so important?

Professor: Well, BDNF is the stimulus, or should I say what stimulates or promotes all higher-level thought processes.

Student 2: So you're saying that without it, we wouldn't be able to think?

Professor: Precisely. And more exercise equals more BDNF, equals a greater capacity to handle cognitive tasks.

Student 2: Interesting.

Professor: Yeah, and that's not all. In a recent study, researchers found that BDNF actually generated new brain cell growth and promoted new connections between these brain cells—first time this was recorded in humans.

Student 1: But, don't we grow new brain cells and develop new connections when we learn something new?

Professor: Exactly, and that's why BDNF is such a significant discovery. It's actually the chemical that facilitates learning.

Student 1: So you mean that exercise facilitates learning?

Professor: Yes, that is what the study indicates.

Student 2: Professor…don't you think we've taken enough in for today? I mean, if we're ever going to remember this stuff, don't you think we better you know take a break—maybe even finish early—so everyone can go outside and get some exercise?

Professor: Not so fast, Sam. I think I asked you to prepare a summary of a research study for the class.

Student 2: Uh, yeah. Um...

CD 2, Track 2
Chapter 4: Listening
Conversation

Narrator: Listen to a student asking a librarian for advice on a research assignment.

Student: Hi…I'm doing research on cultural intelligence and how it might be applied to intercultural business relations with China. Can you give me any advice, you know, like where I might look for information?

Librarian: Okay. So, you want to find out about cultural intelligence and specifically how this relates to business interactions with the Chinese…Well, what you might do is start with your main topic and do a keyword search for cultural intelligence. Let's try that.

Student: Okay.

Librarian: So there are a fair number of resources here. And many of them specifically deal with business and there are several e-books.

Student: E-books, that's interesting. Might lighten the load in my knapsack here.

Librarian: Yeah, and the thing is, I mean the great thing about e-books is that you can locate the specific information you are looking for fairly quickly. You just use the contents list to move back and forth between chapters.

Student: Time-efficient, huh?

Librarian: Yeah, you could say that.

Student: Great, because I've only got a week to get this done.

Librarian: Well, have you thought of looking at magazine and journal articles? You know, that might speed things up for you.

Student: Yeah, good idea. How do I, you know, find them?

Librarian: Okay, so you go to the library main page and click on electronic resources, and that leads you to a variety of databases. Okay, let's try this one—Business Source Complete. That'll give you the business-related information you need.

Student: Main page, electronic resources, Business Source Complete. Okay, yeah.

Librarian: Now here you can do a Boolean search using the keywords *China* and *culture* to find the information you're looking for.

Student: Boolean search?

Librarian: Well, what I mean is using *and* to connect your two search words so that results include both terms and not just one or the other.

Student: Yeah, I've heard of that.

Librarian: Okay. So lots of results here—2058 to be exact. Why don't we narrow the search with one of the criteria listed on the left here. Let's try International Business Enterprises. Ninety-four results. Yeah, this seems to be what you're looking for.

Student: Great, and it will be a lot less time-consuming, I mean, reading journal and magazine articles rather than going through entire books. You know, with my deadline and all.

Librarian: So, don't you think you'd better get started?

Student: Can't wait. Thanks so much for your expertise.

Librarian: No problem.

CD 3, Track 3
Chapter 4: Listening
Emotional Intelligence

Narrator: Listen to a lecture in a neuroscience class. The professor is discussing emotional intelligence.

Professor: Okay. Today we're going to discuss the neuroscience behind a particular **aspect** of emotional intelligence. Now for those of you without the appropriate background on this concept, maybe one of our psych minors can fill us in…Isabel?

Student 1: Okay, well, emotional intelligence…the most widely accepted theory in academic circles is Mayer and Salovey's model, and according to them, there are four main branches.

Professor: Go on.

Student 1: So, first is the capacity to perceive emotions in yourself and others. And then second is the ability to use emotions to enhance thought, like motivating yourself to achieve a goal, or maintaining a positive attitude even when you experience difficulties. And then third is the capacity to understand emotions or understand the reasons why people react as they do. And finally, it's the power to manage or control your own emotions and manage the emotions of others. Like, for example, you can influence or motivate them in some way.

Professor: Thank you Isabel. Well said. So today, we're specifically going to examine why everyone at certain times has some element of difficulty in managing their own emotions—one aspect of Mayer and Salovey's fourth branch.

Now, as you all are aware, we have an emotional and a rational brain…the limbic system and the neocortex, and these brain systems interact with each other. And at various times either one of them can predominate. So, during moments when we find managing our emotions especially challenging, this is because a neurological mechanism has given predominance to the emotional rather than the rational brain in what is generally termed the fight or flight response which is…Rodney?

Student 2: The individual either prepares to engage in some sort of fight or run away.

Professor: Exactly. So how does this happen? What's the process? Let's take a look at this…this diagram here. So when we perceive an object, we see it with our eyes, and a signal travels to the thalamus and the neocortex. The signal is then transmitted to the, visual cortex. So what does the visual cortex do? It examines the signal for meaning and then appropriate response. Now… this seems rather straightforward.

Meanwhile, however, and this is important, a quicker signal has been sent to the amygdala, which is the emotional centre of brain. Now, if the amygdala perceives this signal to be a threat—whether it is an actual threat, let's say a snake, for instance, or one which we might perceive as similar to a past threat, like a garden hose, let's say—it sends crisis messages to all areas of the brain. And this happens before the visual cortex or rather the, the neocortex has had a chance to complete its rational analysis. So at this moment, all we can feel is either fear or anger, and we completely lose the ability to be rational.

Student 2: Like when someone pushes your buttons and you like lose it?

Professor: Exactly! Exactly! That's exactly it.

CD 3, Track 4
Narrator: What does the professor imply when she says this?

Professor: Now, if the amygdala perceives this signal to be a threat—whether it is an actual threat, let's say a snake, for instance, or one which we might perceive as similar to a past threat, like a garden hose, let's say—it sends crisis messages to all areas of the brain.

CD 3, Track 5
Chapter 4: Listening
Conversation

Narrator: Listen to a conversation between a professor and a student.

Student: Hi…hi professor. May I come in?

Professor: You have an appointment? Dave, right?

Student: Yeah, hi. I wanted to discuss my mid-term paper topic with you. I'm kind of, you know, undecided, and I thought maybe you could point me in the right direction.

Professor: Well, I'll see what I can do. Do you have any ideas uh about what you'd like to write on?

Student: Well I was thinking maybe artificial intelligence.

Professor: Hmmm… artificial intelligence, that's a little broad, don't you think?

Student: You mean I should narrow the topic.

Professor: Yeah.

Student: Right. But I don't really know that much about it so I thought maybe I'd come to you and you'd point me in the right direction and you know together, but …

Professor: Okay, okay. Whoa, whoa, whoa! A good place to start is Google…

Student: Google.

Professor: …you want to write that down? Yeah, just start keying in words and see where it leads you. And before you know it, you'll have an idea of various aspects of artificial intelligence and then you can narrow it down from there to an area that you're interested in.

Student: Yeah, that's a good idea

Professor: You can also check out Wikipedia online. It gives you a good, general overview of the field. But double check your sources, though.

Student: Wi-ki-pe-di-a?

Professor: Wikipedia.

Student: Just let me write that down.

Professor: Yeah, for sure. And of course, there's always the library which has a lot of literature on that topic. Actually, it's funny we're talking about this because I just finished a great book by Ray, Ray Kurtzweil. The man is seriously brilliant and has actually written several books on the topic. I seriously suggest you sit down with one of them.

Student: Kurtz, Kurtz-weil? Would you mind spelling that for me? I just…

Professor: I think you'll find it on the supplementary reading list.

Student: Right. Yeah, great. Thanks professor. I just…Do you have anything else you can recommend?

Professor: Well, speaking of the supplementary reading list, I suggest you check out one of the articles on nanotechnology and enhancing human intelligence.

Student: You mean like mini robots in the brain, improving on human intelligence?

Professor: Mm-hmm. You can't tell me you don't know anything about it when you summarize it with such precision.

Student: Well you know, just a little. Just sounds interesting. Maybe a good mid-term paper topic?

Professor: Ah, could be, but I'll leave that decision up to you.

Student: Great. Thanks professor, you've given me some excellent ideas on how to approach narrowing a topic and some great leads… and well, would it be, I mean would be okay or all right, if, if I came back when I had a better idea of…you know what I'm going to do, just in case I haven't narrowed the topic sufficiently?

Professor: Yes Dave, you can come back any time. Talk to you soon, I hope.

Student: Great. Thanks again.

Professor: Good luck.

CD 3, Track 6
Narrator: Listen again to part of the conversation.

Student: Kurtz, Kurtz-weil? Would you mind spelling that for me? I just…

Professor: I think you'll find it on the supplementary reading list.

Student: Right. Yeah, great. Thanks professor. I just…Do you have anything else you can recommend?

Professor: Well, speaking of the supplementary reading list, I suggest you check out one of the articles on nanotechnology and enhancing human intelligence.

Narrator: Why does the professor refer to the supplementary reading list?

CD 3, Track 7
Chapter 4: Listening
Smart Mobs

Narrator: Listen to a lecture in a sociology class. The professor is discussing smart mobs.

Professor: Okay everyone. Today I want to continue our discussion on new forms of social behavior that have evolved … as a result of modern communication technologies. For instance, devices with SMS or short message service or texting, have started… have set in motion what is now known as the smart mob.

So, you've heard of raves, right? You know these huge dance parties that go on all night. Well, this whole movement, this whole thing with smart mobs, started with young people in Tokyo and Helsinki. They used the first cheap mobile texting units to let each other know the location of their next big dance event. So, what happened here was that SMS technology, where you can send a single text message to your entire address book, allowed large groups—even mobs—to get together for a huge dance party at a moment's notice. But this was just the beginning. With the younger generation leading the way, smart mobs or, large groups empowered with Internet-enhanced communication devices, began turning up just about everywhere to accomplish a variety of diverse goals.

Okay, so political goals. Now, did you know that the massive demonstration that drove out the corrupt leader, President Estrada, in the Philippines, was organized through the use of SMS or texting technology? And were you aware that the political gatherings against the World Trade Organization in Seattle, and the demonstrations against the Miss World beauty contest in Nigeria were mobilized in this very same way? And then, of course, there's the Virginia Tech incident. Remember the English major who shot and killed 32 people on that campus? Now in this case, individuals made use of not only texting but also webcam and cellphone video to let victims know how to avoid danger. So…what we're seeing here is that as technologies improve, people are finding creative ways to utilize them to their mutual advantage.

What about environmental goals? Smart mobs like critical mass bike rides are now an international phenomenon. You've seen these cyclists on the streets, no doubt. So what happens is that large groups get together for mass bike rides. And this takes place via web postings and mobile phone trees. And these huge groups of cyclists show that cycling can truly be a practical alternative to driving, which, as you know, causes a lot of damage to the environment.

So, what next? Well, another group social behavior that is benefiting from advances in communications technology is the mating ritual. Now I have your attention! What happens here is that groups of people who sign up for dating services as a part of their cellphone package fill in a personality profile. And then they can actually find out when a potential match is in close range—like on a bus, in a park, or even in this lecture hall, for instance! Now, the way this works… the tracking device—it's powered by Bluetooth technology. And this is a short-range radio frequency that operates within a 10-meter radius. So, let's say you have one of these phones and your phone picks up on a match. Well, the other Bluetooth user's information comes up on the screen. And then it's up to you if you want to text the other person and meet. As I'm sure you can understand, both texting and Bluetooth have taken off in a big way in countries such as India, Saudi Arabia, and the UAE. In these places, dating prior to marriage isn't generally accepted by the majority, especially the older generation. So without their parents' knowledge, young people are now meeting and getting to know potential mates. So again, the trend here is that groups… or even mobs of individuals with a shared problem are using smart technology to find ways around it.

And then, of course, there's peer-to-peer software where large groups of people use Internet and communications technology to pirate music, videos, and even other software programs. In the peer-to-peer paradigm, individual computers connect to transfer specific files. And although illegal in many countries, users keep on doing it because the creative software applications make it almost impossible to track them.

A related phenomenon is distributed computing. This works by making use of the unused power of individual computers. For example combined computer power can assist in various ways, such as the treatment of cancer, the development of medicines for AIDS, weather prediction related to global warming, and even the search for extra-terrestrial intelligence. Computer users simply open a screen saver that draws on their unused processing capacity. The shared power of the millions who take part in these schemes forms the basis for…you guessed it, yet another…smart mob.

CD 3, Track 8
Narrator: Listen again to part of the lecture.

Professor: So what happens is that large groups get together for mass bike rides. And this takes place via web postings and mobile phone trees. And these huge groups of cyclists show that cycling can truly be a practical alternative to driving, which, as you know, causes a lot of damage to the environment.

CD 3, Track 9
Chapter 4: Speaking
Self-fulfilling Prophecy

Narrator: Now listen to part of a talk in a social psychology class. The professor is discussing research related to self-fulfilling prophecies.

Professor: So, the self-fulfilling prophecy. We're looking at two studies today and how this phenomenon relates to intelligence. So in the first study, teachers were told that select groups of children in their classes were highly intelligent. The fact is, however, that these children were merely average achievers. But when researchers returned at year end, the students who had been identified as intellectually gifted…these students made more significant gains in their academic performance than the others. So what this shows us is that the teachers who believed these students to be more clever must have done something, must have behaved differently in some way, to boost their academic performance.

Now, the second study is a little bit different. Here, college students in one group were given instruction relating to the malleability of intelligence. In other words, they were taught that intelligence and even IQ scores were changeable, not fixed. And not surprisingly, those who learned that intelligence wasn't set in stone, but could, in fact, improve, actually received higher grades than the control group who received no such instruction. So, what must have happened here is that these students must have adjusted their behavior, for instance by working harder, in order to make the prediction come true.

Narrator: Now get ready to answer the question.

The professor discusses two studies on intelligence. Explain how the concept of a self-fulfilling prophecy contributed to a perceived increase in intelligence in the two groups

CD 3, Track 10
Chapter 4: Speaking
The Mozart Effect

Narrator: Now listen to part of a lecture in a music class. The professor is discussing research related to the Mozart Effect.

Professor: Okay. So we've all read about the Mozart Effect in our textbooks. But while this is all very fascinating, it is important to realize that this effect, this increase in spatial temporal reasoning, only lasted for 10 to 15 minutes. And also, the effect could not be duplicated with other pieces of music. It only worked with Mozart's Sonata for Two Pianos. Now, intriguing as this result may be, researchers felt that passively listening to music was not sufficient for a long-term or permanent increase in spatial intelligence. So they decided to redo, to replicate, their original study involving active music training because it had had more long term and…significant results.

And the reason that they felt this research was so relevant, so important, was that spatial-temporal reasoning has applications in diverse fields. For example, it applies to the sciences…architecture, engineering, mathematics…art and even computer science. So they felt that their work could have implications for the education system at large. In other words, music education could become mandatory as a result.

So, using a larger sample of pre-schoolers, they arranged for two groups. One group participated in keyboard training and singing lessons. And the other received computer instruction. And the result? Students with music training got 80 percent higher scores in spatial temporal reasoning tasks than the control group. This means there was a definite, even causal relationship—with music training as the cause and an increase in spatial IQ as the effect.

Narrator: Now get ready to answer the question.

The professor discusses the Mozart Effect and related research. Using examples from the lecture, describe the limitations of this effect and the subsequent research that has proven to have a greater impact on spatial IQ.

CD 3, Track 11
Chapter 4: Speaking
Intelligence in Nature

Narrator: Now listen to part of a lecture in a biology class. The professor is discussing research related to intelligence in nature.

Professor: So, let's look at the evidence supporting intelligence as a pervasive force in nature. First, the honeybee…recent experiments support their use of abstract reasoning, learning, and accurate decision making. So, research. These honeybees were in a trial whereby they entered a simple Y-maze marked with the color blue. After the bees entered the maze, they came to a decision chamber and saw two paths, one marked blue— and the other yellow. At first, the bees didn't know that the blue path led to a tasty reward in the form of a sugar solution. But they were quick learners and, in fact, when the maze entrance was marked with a different symbol such as three horizontal lines, they quickly made the connection to follow the route marked with that same symbol. In other words, they had reasoned abstractly to determine that sameness equaled a reward. In variations of this same experiment, the honeybees selected the identical symbol, regardless of whether that symbol was a color… a pattern… or even an odor.

A second example involves the dodder, a parasitic plant. The dodder forages for food by assessing the nutritional benefits of various host plants. Once it finds the plant with the most nutrients, it wraps itself around the plant and begins to feed. These actions show planning and accurate decision making… in order to achieve the goal of survival. The dodder doesn't feed on just any plant. It searches for the one with the most nutrients. This involves planning and decision making. And this shows a certain amount of intelligence on the part of the plant.

Narrator: Now get ready to answer the question.

The professor describes two examples of intelligence in nature. Explain how the examples relate to common definitions of intelligence.

CD 3, Track 12
Chapter 4: Speaking
Emotional Machines

Narrator: Now listen to part of a lecture in a computer science class. The professor is discussing applications of affect or emotion in technology.

Professor: Alright everybody, today we are going to explore the applications of affect or emotion in technology. First, let's review an interesting development from Tokyo where Atsuo Takanishi has created humanoid robots that express emotion and communicate naturally, so as to provide service as salespeople or tutors, let's say. Next thing you know, they'll have humanoid professors, right? Maybe a humanoid robot delivering the mail…I don't know.

So, using facial expressions and upper-body movements, Takashini's latest model, the WE-4RII can express fundamental emotions such as happiness, sadness, anger, fear, surprise, and disgust—the same basic emotions we all feel and express.

Another example of emotion in technology is affective computing or computers that perceive and respond to emotions. For example, if you're writing your final paper for me and the computer… senses frustration, it might tell you to take a short break. Or if the computer senses enthusiasm, it might try to motivate you even more by playing your favorite song.

And how is this possible, you might ask? Well, enter voice-recognition software, cameras that can track facial expressions, and the Emotion Mouse that can track temperature changes and changes in heart rate. So now computers can actually sense your emotions and respond appropriately to them. I know—it's pretty amazing stuff, eh?

Narrator: Now get ready to answer the question.

The professor describes specific applications of emotion or affect in technology. Explain how these examples relate to the principles of emotional intelligence.