

# Transcribe Me!

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## Transcription results:

- S1 00:00 Hi, this is Tim Lightfoot, the director Huffines Institute. To start the podcast, I'd like to take the chance to tell you about this year's rendition of the award-winning Huffines discussion. HD6 will take place on Friday, November 11th, from 1:00 to 4:00 PM in the Annenberg Presidential Conference Center here at Texas A&M. We're thrilled to have eight world leaders in sports medicine and human performance give their big ideas, all in a language you can understand and use in your daily life. Dr. William Dexter, Dr. Russell Pate, and Texas A&M legend, Mr. Dat Nguyen, are just three of the eight exciting speakers here to share their thoughts on what's next in the field. We'll see you at Annenberg on November 11th. If you can't make it here, all of these talks will be up on the podcast started in January. Now, onto the podcast. [music]
- S2 00:46 Welcome to the Sports Medicine Podcast brought to you by the Sydney and J.L. Huffines Institute for Sports Medicine and Human Performance in the Department of Health and Kinesiology at Texas A&M University. At the Huffines Institute, we're always working to facilitate, apply, and bring you the most up-to-date coverage of the wide world that is sports medicine and human performance, all in a language you can understand and share with your friends. And now, here's our host, the director of the Huffines Institute, Dr. Tim Lightfoot.
- S1 01:16 Well, hello and welcome to the weekly podcast from the Huffines Institute for Sports Medicine and Human Performance. I'm your host, Dr. Tim Lightfoot, and I'm so glad that you all took the time to download us, and you're taking the time to listen. Every week, we work really hard to bring you an interesting person from the world of sports medicine and human performance, and today is no exception. We are so pleased to have with us Dr. Deanna Kennedy with us in the podcast. Welcome to the podcast, Deanna.
- S3 01:42 Thank you.
- S1 01:42 So glad to have you here. I'm going to tell the audience a little bit about you and then we're just going to jump right into the conversation. Okay?
- S3 01:48 Okay, sounds great.
- S1 01:49 Okay. So, Dr. Kennedy is an assistant professor here in the Department of Health and Kinesiology. She's actually in the division of kinesiology. She has her PhD from right here at Texas A&M in kinesiology, master's as well. And a bachelor's in kinesiology from California Polytechnic State University in San Luis Obispo. She's currently an associate professor, as I said before, and she has had a role as an adjunct professor before at Sam Houston State University. She works in the area of motor control and motor learning, and that's what we're going to talk about today. And in particular, I want to start off with-- one of the things that you have on your website and your CV is that you work in the area of bimanual coordination, so tell everybody what bimanual coordination is.
- S3 02:34 So, bimanual coordination is just the ability to coordinate your limbs together to accomplish a task goal. So tasks, such as playing a piano, or hitting a tennis ball with a tennis racket.
- S1 02:48 So if I can't play the piano, then I don't have bimanual coordination?
- S3 02:52 No, buttoning your shirt, tying your shoes, all involves some type of coordination between your limbs.
- S1 02:59 So, why is of interest research wise? Don't we just do that automatically?
- S3 03:03 Well, some tasks are a lot easier than other tasks. So as you just referred to playing a musical instrument, it takes a lot of coordination and practice to be able to perform that type of task. The difficulty with those tasks is to believe that there's interference between the limbs. So, if--
- S1 03:23 Wait, wait, wait. You mean, the limbs actually interfere with each other?
- S3 03:27 Yeah. If you're trying to tap, if you're a drummer, three times with your left hand and two times with your right hand, it could be very difficult to do. So we want to understand those difficulties, and maybe come up with techniques and strategies so we can override that, so people can perform some coordinated task easier.
- S1 03:49 So let's just start with tying the shoes thing, because that's a skill that kids learn at some point.
- S3 03:55 It is.
- S1 03:55 Is that part of developing their bimanual coordination when they do that?
- S3 03:59 It is, and if you think about a child learning that task, it doesn't come easy. They have to spend a lot of time practicing that technique.

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- S1 04:08 Is it because they have that issue with bimanual coordination, or is it just trying to remember the steps?
- S3 04:14 It could be a little bit of both. So the interference can be at the cognitive level, or it can be at the motor level, and what I study is how the limbs interfere with each other, making that task more difficult.
- S1 04:34 Okay. So when you talk about limbs interfering, are you talking about in the brain? In the motor areas of the brain, or--?
- S3 04:39 Yeah, so within this context.
- S1 04:41 Tell us, Deanna. That's where [laughter]--
- S3 04:43 Okay. Okay. Okay, I will. So within this context, I study coordination from the concept of neural crosstalk, which neural crosstalk is a mere image command sent to different muscles. Right? So, if you're trying to tie your shoe, you have one limb trying to make a loop, the other limb trying to do a straight pattern. So a signal is going to one side of the body saying, "Do this." A signal is going to the other side of the body saying, "This." And those signals are interfering with each other, thereby making the task more difficult.
- S1 05:19 Okay, so are they interfering with each other at the spinal level where the motor nerves come off?
- S3 05:26 So, it's believed to occur at two different locations. Higher up the corpus callosums, so that's responsible for sending the signals higher up in the brain, or deeper at the spinal level, interfering in the motor output area.
- S1 05:43 So, you don't do this research just because you're interested in how kids learn how to tie their shoes?
- S3 05:49 No. I mean, I got into this area of research just-- I love sports. But from a sport context, for me, personally, I throw a baseball with my right hand, but I throw a Frisbee with my left hand. So there's this, "Why do I control one movement this way and a different movement this other way?" So I wanted to understand how do we control our movements and how do we learn these new physical movements that we use, say, in a sport context or an everyday context.
- S1 06:22 So, is there application for the things you're learning towards helping athletes perform better in the end, or--?
- S3 06:29 In terms of bimanual coordination, I specifically don't look at it at a more basic level, so more from a musical perspective, which we talked about. But there's always applications for what we study at the basic level to how we can do it in sports. So, we could say more practice you override some of the interference between the limbs. So, an athlete-- we know that practice benefits our overall performance.
- S1 07:00 There's two sides of the argument that you can't multitask. Some people say you can't multitask whatsoever. Some people say yes you can. So does this bimanual coordination, does that have anything to do with whether we're multitasking or not?
- S3 07:15 In some ways, it could. Right? So, what you're talking about is splitting our attention between two different tasks. So if we're talking about the first part of the question that you asked, "Can you multitask," right? Well, if you're trying to read and watch TV at the same time, it's difficult because it's using the same attentional resources. But if you're trying to iron and watch TV at the same time, it's something we can do because it's using different attentional resources. So with bimanual coordination, if the signals are not competing against each other, then we can do these tasks very easily. And if they are competing against each other, then it's more difficult.
- S1 08:04 To come back to our example of tying your shoe, is that an example where you can't multitask because there's interference between--?
- S3 08:12 Well, we can tie our shoes and-- we have so much practice, if you tied your shoes, you could still do this podcast right now, at the same time.
- S1 08:22 I don't know. Let's see me try, but you go ahead. Keep talking.
- S3 08:24 So we can do this because we have become experts at tying our shoes, but when we were first learning how to tie our shoes, it took all our attentional resources.
- S1 08:38 Right. And it's difficult to focus on you when I'm trying to tie my shoe.
- S3 08:42 Is it now?
- S1 08:43 Yes, sir.
- S3 08:43 You might need a little more practice--
- S1 08:44 No, because I'm trying to think about--
- S3 08:45 --tying your shoes.
- S1 08:46 Well because I'm not looking at it, either.
- S3 08:47 There you go, yeah.
- S1 08:48 See that's the other aspect. So visually, I don't have it in my sight. So, does that add to the difficulty or to the ease when you

can visualize it as well?

- S3 09:00 Well, it depends on the type of visual feedback we're talking about. So in my research, I use a type of visual feedback that's referred to as Lissajous feedback. So Lissajous feedback integrates information from the left and right limbs into a single point, much like a video game, right? When you play a video game, there's one avatar on the screen that you control with two different thumbs. So to make my bimanual coordination tasks easier to perform, I integrate the information from the left limb and the right limb into a single point. And when people have that type of visual information, they can easily do the task. However, let's say, you were trying to learn a new dance skill and I let you watch your feet--
- S1 09:46 That would be very-- yes, it would be [laughter]--
- S3 09:47 It would be very difficult to perform that. So in our task, we even find that if we cover the limbs, we don't allow people to see what their limbs are doing, they can do a lot of these coordination tasks.
- S1 09:59 So, it sounds-- recently I learned how to paddleboard, and one of the things the guy-- the instructor said is, "Don't look at your feet, look at the horizon, that will help you so much more." That would be an example that--
- S3 10:10 That would be an example, yes.
- S1 10:12 Interesting. So for the folks listening out there, why should they in their life be concerned with bimanual coordination? Let's say, we have elderly individuals listening.
- S3 10:22 So bimanual coordination is something we use, it's a part of everyday tasks. Tying your shoes, buttoning your shirt, slicing bread, they all involve some type of coordination. Now let's say an older person had a stroke and they lost some of that ability to coordinate the limbs, this is why it would be important to study bimanual coordination to retrain individuals how to redo these tasks.
- S1 10:50 I notice that some of your work is dealing with stroke rehab, how can you use this kind of work to help folks with their stroke rehabilitation?
- S3 10:59 I have not got into the application part of this. Again I'm just studying this from the basic level, but my hope would be if there are signals from the brain interfering with each other, could we learn how to use those interfering signals in individuals who lost signals on one side of their body to recover from stroke?
- S1 11:23 Interesting stuff. If someone were to ask you, what do you see five years down the road from this? What would you say?
- S3 11:31 I would hope-- in terms of bimanual coordination?
- S1 11:34 Sure, and the application to stroke rehabilitation. Tell us what you're going to do for the next five years, I guess, is what I'm asking [laughter].
- S3 11:42 I would like to continue studying what I'm studying, but get it to the application stage. I would like to try to use the type of feedback we talked about to helping individuals that may have deficits and force control. So individuals with strokes, say, cerebral palsy, multiple sclerosis, and using these bimanual tasks to rebuild strength in both limbs rather than just one limb.
- S1 12:18 So it certainly a situation, sounds like where if they practice it gets better. It's a focus practice-- deliberate practice, I guess is the more appropriate term.
- S3 12:28 Yeah. So any motor tasks you've learned, the more practice you have, the better you're going to get. Now with bimanual interference, the more practice you get, we're reducing that internal interference, allowing us to perform the task at a higher level of proficiency.
- S1 12:45 So, we can tell everybody out there that they should be practicing.
- S3 12:48 They should, always.
- S1 12:49 Always.
- S3 12:49 No matter what the skill is [laughter].
- S1 12:52 So, how did you get interested in this? Again, you have a background I know in gymnastics. Is this something that just always spoken to you, that I want to go deep into the brain and find out why my limbs move the way they do?
- S3 13:02 Well, it does. I told you how I was always curious why I did certain tasks one way, and other ones, a different way. So, I've always enjoyed sports and activities. It's been a big part of my life. I have always had a passion for teaching. I started my career as teacher, and as you referred, to gymnastics, so I taught gymnastics for a while and other motor skills. And I saw that with some individuals, the type of feedback that you gave them really played a role in what and how they learned. And so I became more and more curious about it and I started taking more and more classes as I was working as a teacher, and pretty soon I was close to having a PhD and just studying what I was wanting to study for fun.
- S1 13:57 Hey, I'm still here, right?
- S3 13:58 And I'm still here [laughter].

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- S1 14:00 Good deal. So if you had to give the audience one take home message from this podcast, what would that take home message be?
- S3 14:09 I guess since we're talked a lot about practice, we want to make sure that we continue to be active as we age. If we don't use it, we lose it, and that is--
- S1 14:23 And that's true, isn't it?
- S3 14:25 It is true. And this is occurring not just during physical practice but we can look deeper into the brain and see that people cannot control their movements as well when they don't use those movements over time.
- S1 14:43 Great take home message. Keep practicing.
- S3 14:45 Keep practicing.
- S1 14:45 That's right, keep practicing. So, thank you so much for being with us today.
- S3 14:49 Thank you.
- S1 14:50 And as regular listeners know, this is also the time of the podcast where we have the podcast question of the week, and so here with the podcast question of the week is our executive producer, Kenneth McIntyre.
- S4 15:02 What is Lissajous feedback?
- S1 15:04 Great podcast question, Kenneth. Be the first person to email us the correct answer to that question at [huffines@tamu.edu](mailto:huffines@tamu.edu), and you'll win one of those nifty podcast T-shirts. Again that email address has changed recently, so it's [huffines@tamu.edu](mailto:huffines@tamu.edu). And so, thank you all for being with us this week. Thank you, Deanna, for being with us as well.
- S3 15:28 Thank you for having me.
- S1 15:29 We're glad to have you. And we hope that all of you join us next week when we have another interesting person from the world of sports medicine and human performance, and until then, we hope that you stay active and healthy.
- S3 15:41 The executive producer of the sports medicine podcast is Kenneth McIntyre. This podcast is licensed by the Huffines Institute at Texas A&M under a Creative Commons 3.0 license. You can share it as much as you want and you can talk or blog about it all you want, just don't change it or charge money for it. This podcast is made possible by support from the Omar Smith Family and the Sydney and J.L. Huffines Family. Our music was composed, performed, and graciously provided by Dave Zeltner Productions. Your source for quality music and music production since 1992. Find them at [www.davidzeltner.com](http://www.davidzeltner.com). Our opening and closing credits were provided by John Miles Productions at [johnmilesproductions.com](http://johnmilesproductions.com). If you have questions or comments, please send to [huffines@tamu.edu](mailto:huffines@tamu.edu). From all of us at the Huffines Institute, we hope you have an active and healthy week. [music]