

Transcript of 'Words' Podcast from NPR
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Jad Abumrad: Hey everybody, this is Jad from Radiolab. Just want to thank you for downloading this Radiolab podcast, and to let you know that we've got a whole bunch of other one hour episodes, and podcast shorts on our website, radiolab.org, and of course you can get it all through iTunes too. Thanks for listening!

Man: Hey wait you're listening *(laughs)*

Woman: Ok

(music)

Man: Alright

Woman: Ok

Man: Alright *(clears throat)*

Woman: You're listening

Man: Listening

Woman: To Radiolab

Man: Radiolab

Woman: From *(unintelligible)*

Man: WNY...

Group: C, c *(echos)*

Woman: C?

Man: Yep

Group: *(laughs)*

Woman: And NPR

(music ends)

Robert Krulwich: Ok, let us begin.

Woman: Hello, hello! (*laughs*)

RK: Eh, with a, an unusual encounter, which comes from this lady, here.

Woman: I'm, um, Susan Schaller and... where do you want me to start?

RK: Her story starts out, a-actually it starts kind of abruptly.

SS: I was, uh, indeed riding a bicycle to high school...

(bicycle bell ringing)

SS: And...

(tires screeching)

(Man: Bam!)

(car crashing)

SS: A catering truck hit me.

(Man #1: Oh.)

(Man #2: Ay ay ay.)

SS: And I was put in the hospital with a concussion. I was seventeen years old, and the concussion was bad enough that, um, it slowed my brain enough that I couldn't read, and so naturally I couldn't go to school.

Jad Abumrad: Which *sucked*, for her.

SS: At seventeen I was very much a nerd...

RK: (*laughs*)

SS: And I was *bored* out of my mind... (*fades out*)

RK: So imaging Susan sitting there in the hospital, mmm, one day, one of her friends...

SS: ...Friend of mine who was just a little older and had graduated a semester before me suggested going to the nearby university and, uh, crashing classes. So I did that...

RK: (*overlapping SS*) Now wait a second, wh-wh-why would you go if your *brain* was working slowly, why wouldn't you go... swimming?

SS: (*overlapping RK*) Well I couldn't, I couldn't read, but I could listen and I could hear and I and-and the person was saying that, "Oh! It's a lot better than high school!"

RK: (*laughs*)

JA: And so one day she was at this college.

RK: Just kind of wondering down a random hallway.

SS: And I opened the first door on the left. That was the accident that changed my whole life, just picking that door.

RK: At the front of the room, there was this older guy, he was thin he was bald and he was tracing shapes in the air with his hands.

SS: It was as if there were.. pictures being painted in the air and then they immediately disappeared. Then another picture appeared. I was mesmerized!

JA: Uh huh.

SS: The professor was *signing*.

RK: This class, was actually one of *the* first classes to teach sign at a regular hearing university... ever!

SS: I had, I had also walked into history but didn't know it.

RK: Fast forward five years, Susan now is *fluent* in sign, she moves to Los Angeles, it's the late 1970s.

SS: Then I was snatched and put into interpreter training programs because at that time there were very very few interpreters, and I found myself in a classroom..

RK: In a community college.

SS: In something called a reading skills class.

RK: So, she walks into the class, sees kids *all* over the class room making *big* excited gestures one to the other.

SS: And at the door, I saw this man holding himself..

RK: Kind of off by himself.

SS: Making his own straitjacket.

RK: She went over to the instructor and she pointed at the guy and said, "Who-who's that guy over there?" And the instructor said, "Well, um, he-he was born deaf, his uncle, he has this kind of *insistent* uncle who-who brings him here everyday, w-we don't know exactly what to do with him though."

SS: And...

JA: What did this guy look like?

SS: He w-was a beautiful, um, well I, now I know, I don't know if I would've had that in my head at the time, but a beautiful looking Mayan. You know, high cheek bones and black hair, black eyes.

RK: And something about his eyes..

SS: He was...

RK: Caught her attention.

SS: He was studying mouths, and I, I walked up to him and said, "Hello, my name is Susan."

JA: And this is where things start to get a little weird. He looks at her, and instead of signing his name, whatever it was..

SS: He brings up his hands..

JA: And signs right back to her...

SS: "Hello, my name is Susan."

RK: Susan like shakes her head and says, "No, no, I'm Susan."

JA: And he responds, "No, no, I'm Susan."

RK: Everything you said he tried to say?

SS: Exactly, I-I call it visual echolalia (*echos*). And I remember thinking...

RK: Why is he doing this?

JA: I mean Susan did he, did he look like he had some kind of disability or, or condition?

SS: He was, um, he was intelligent. I wouldn't have been able to answer if you had asked me how can you see intelligence, but you can actually see intelligence in people's eyes.

RK: He was just... *missing* something.

SS: To copy me meant that he didn't really know what I was doing.

RK: And that's when it occurred to her.

SS: This man doesn't have language.

JA: Wait, how old was this guy?

SS: He was twenty-seven years old! And...

JA: And in all that time no one had taught him sign language or anything?

SS: Well, he didn't know he was *deaf*. He was born deaf, he didn't know there was sound.

JA: Really?

SS: Twenty-seven years, *no* idea that there was sound. He could see the mouth moving, he could see people responding. He thought we figured all this stuff out visually. A-and he thought, I must be stupid.

JA: And so here's the question for our hour. This is Radiolab, I'm Jad Abumrad.

RK: I'm Robert Krulwich.

JA: Words. What do words do for us?

RK: Are they necessary?

JA: Can you live without 'em?

RK: Can you think without them?

JA: Can you dream... without them? Can you...

RK: That's enough.

JA: Can you swim without...

RK: *(overlapping JA)* No, that's enough.

JA: Alright.

RK: *(laughs)*

JA: *(overlapping RK)* Back to the story. So this man that Susan met, we don't actually know his real name, but when she wrote about him in her book, *A Man Without Words*, she called him, Ildefonso.

RK: There they are, sitting in the classroom, she's right there with him.

JA: Of course she's wondering...

SS: What have you been *doing* for twenty-seven years?
(laughs)

RK: So she thinks, let me see if I can teach him some just basic sign language. An interesting case she takes out a book, and makes the sign, *book*.

SS: But, the sign for book is, looks like opening up a book. So, he thought I was ordering him to open a book.

RK: So he grabs the book and he opens it!

SS: 'Cause he thought I was asking him to do something. It was very difficult. If-If I gave him the sign for standing up, he thought I wanted him to stand up. And so I couldn't, I couldn't have a conversation with him, and it was the most *frustrating* thing I have ever done in my life.

JA: Wait a second, how long did this go on for?

SS: Well uh, weeks, it was weeks.

JA: Wow.

SS: Often times, when we say goodbye or just left, we couldn't really say goodbye, I really believed that we wouldn't see each other again, and I was often times very surprised when he would be sitting there at the table, and I think sometimes he looked surprised that I showed up.
(*laughs*)

RK: But after a couple of weeks of him...

SS: *Constantly* miming, *copying* me.

RK: She had... an idea.

SS: Perhaps, it's just possible that if, uh, if I died tomorrow I would've had only one *really really* good thought in my life, and this was it: I thought, I'm going to ignore him!

SS: I taught an invisible student. I stopped talking to him, and I stopped having eye contact, and I set up an empty chair.

JA: And then she says she would hold up to this empty chair a picture of a cat.

SS: And I was trying to explain to this invisible student that this creature, a cat, so I'd be miming a cat, and petting a cat, and then I signed the sign for cat...

JA: Then she would hop to the other seat, the invisible student's seat, *pretend* to get it.

SS: "Oh! Oh!" You know was my facial expression, "Oh I get it!"

RK: (*overlapping SS*) So, you're playing *all* the parts! You're both the teacher and the invisible student!

SS: That's right! That's right!

JA: Wow.

SS: Doing all these crazy things, and he just watched me!

JA: He stopped copying her, which was good...

SS: But, I'd do this over and over and over for days and days and days.

RK: And she says he just didn't get it.

SS: He was, he looked bored a lot of times.

RK: But *one* day, in the middle of one of these *endless* pretend student exercises...

SS: Something happened!

RK: Out of the corner of her eye, she sees him *shift* his body.

SS: And he looked, It's interesting how his body was upright, and he looked like something was about to happen. He looked around the room, this is a twenty-seven year old man, and he looks around the room as *if* he had just landed from Mars, and it was the first time he had ever saw anything. Something was about to happen.

JA: "His eyes grew wider," she says, "and then wider!" And then...

SS: He stops his hands on the table, "Oh! Everything has a name!"

(rejoiceful Latin music)

SS: And he looks at me in this demanding way, and I sign, table, and he points to the door, and I sign, door, and he points to the clock, and he points to me and I sign, Susan. And then... he started crying. He just collapsed and he started crying... What is it that happens in human beings when we get symbols, and we start trading symbols? It changes our thinking, it changes our ideas of-of, it's, it's no longer the *thing*, a table that we eat on but, there's something about the symbol, *table*, that makes the *table* look different... Ildefonso was in love... He was in love! He's like, "Everything has a name!" ...And for the first couple weeks, he had this, this list of names that kept growing and growing.

(two children alternating: paper, eagle, clock, green...)

SS: I... kept copying words for him.

(cat, ?, cat, cardinal...)

SS: Gave him the sign for door...

(door, door...)

SS: Then I would...

(door!)

SS: Write, d-o-o-r.

(serpent, ?)

SS: And he...

(strawberry)

SS: Folded this paper...

(paper, paper?)

SS: As if, there was...

(treasure!)

SS: Treasure, and he would pull it out everyday, and he would...

(lion)

SS: Carefully unfold it...

(tiger!)

SS: And he would add to it...

(orange juice, apple, ?, thinking!, believe, ?, leaf, ideas)

SS: Add to it...

(lamb, ?, table, bird, wall, dove, name)

SS: Add to it...

(pig, left, front, right, cows, [*cawww*] hawk, left... of the bluuue wall, octopus, symbol!, treasure!, words!, eggs, ?)

SS: What does it that happens in human beings when we get symbols...

(symbols)

RK: And that, you know, once you have begun to put words on to things, you can look at a thing, say this symbolic sound, "table," and the person opposite you knows what you're talking about.

JA: She seems to be saying something deeper though, that like when you get the word for *table*, that suddenly the *table*, like this table right here... (*knocking*)

RK: (*overlapping JA*) Yeah, but...

JA: (*overlapping RK*) Looks different, like it somehow the word changes... the world! ...in some fundamental way. Now, I don't know if that's true about the table thing, but, consider what happens when you put words together, ok, when you link them up.

(Man: Good? Ok.)

JA: So I want to tell you about this experiment.

(Man: Fantastic.)

JA: That I learned about from uh, a fellow I talked to sometime. Charles...

Man: I'm Charles Fernyhough, I'm a psychologist at Durham University in the UK.

RK: Fernyhough.

JA: And uh, when I first read about this experiment in Charles's book...

Charles Fernyhough: Called, *A Thousand Days of Wonder*.

JA: It blew my mind out of my nose and on to the book.

RK: *(laughs)*

JA: A little messy.

RK: I never want to be with you in a library.

JA: *(laughs)* Takes a little journey to get to the mind blowing part, but, um, luckily, I'll let Charles explain it. The whole thing happens in a room.

CF: Yeah, you're put into this room which is colored completely white. The walls are white, the ceiling's white, the floor's white.

RK: So it's all white.

JA: All white.

CF: Everything's white. And you can tell where you are t-to the extent that some of the walls are longer than others, so on your left hand side...

JA: Are we in a rectangle? Is what you're describing?

CF: Yeah, it's a rectangular room.

JA: Are you with me so far?

RK: I'm with you so far.

JA: Ok, just to give you a sense of the baseline conditions here, imagine you are a rat in this room, ok?

CF: And, somebody comes along and hides an object in one corner of the room.

JA: What?

CF: It can be anything. I mean for rats you'd use food.

JA: Like a biscuit or something?

CF: Yeah.

JA: You hide a biscuit in one of the four corners.

CF: In one corner.

JA: You see it...

RK: Ok.

JA: But before you can get to it, they pick you up by your tail, spin you around a bunch of times...

CF: So you don't know where you are, you don't know which direction you're facing in, and then they say, "Right, now go find the biscuit."

JA: So if you do this with a rat, what will happen, is it'll say, "Alright, let me go find the biscuit." And it will...

CF: Go to one corner which looks right.

(mouse scurrying)

CF: But of course the room also looks like that if you turn it around three-hundred and eighty degrees and face exactly the opposite direction.

JA: 'Cause it's a rectangle.

CF: So, uh, they get it right about fifty percent of the time.

RK: Because corners of rectangles, two of them are identical!

JA: Yeah!

RK: Alright so, uh (*clears throat*) should we get on with this? Because I'm well aware of rectangles.

JA: (*laughs*) This is, I just, I just needed to get that out of the way...

RK: Ok...

JA: 'Cause the cool part is coming up.

RK: I hope so.

JA: What the experimenters did next, is they took one of the four white walls...

RK: Mm hmm

JA: ...And they turned it blue! So imagine this scenario, you're in this room, you've got these four white walls, or, or rather, three white walls...

RK: One of them is blue!

JA: Right. Well now, you're not confused anymore! You can, you can relate everything to the blue wall. You can be like, "Oh! The corner with the biscuit was *left* of the blue wall!" or, "*right* of the blue wall!"

RK: I like it to the left.

JA: You now have the blue wall as a...

RK: Navigational clue.

JA: Yes!

CF: That makes sense, you know, we would all be able to do that. That's not going to be... difficult for us.

RK: Alright (*laughs*), have we got to the good part yet?

JA: Yeah! It's coming, it's coming.

CF: Turns out though...

JA: The rats, he says...

CF: They, they're still scoring fifty / fifty.

RK: What?

CF: It's as if they can't take any notice of the blue wall.

JA: *Even* with the blue wall, they're only finding the biscuit fifty percent of the time.

RK: Wait a second, can a rat see color?

CF: Yeah! Rats can do color.

JA: They do color pretty well.

RK: Ok.

JA: They also do left, right, just fine.

CF: But what they *can't* do, is connect those two bits of information together.

JA: In other words, they can only, well they can do left, that they can do. They can do *blue*, do blue, but it's, they're both separate, they can't do, *left of blue*.

CF: These different kinds of knowledge can't talk to each other.

RK: How did anyone know that? I mean who-who, wh-what rats have been interviewed for this survey?

JA: *What?* They, they *infer* this based on studying the rats.

RK: So the rat doesn't have what? Doesn't have the neurons? Doesn't have the, what is it that he doesn't have?

JA: The rat can't do it. That, that's all that you need to know. And, and I'm gonna make it weirder right now... neither can some humans.

Woman: I spent the first ten or fifteen years of my scientific life studying creatures who don't talk yet...

(baby cooing)

JA: That's, Elizabeth Spelke, she's a psychologist at Harvard. Quite famous for her work with, um, *(women with babies in the background)* as you can hear.

Elizabeth Spelke: Babies, and... I was interested in, uh, their abilities in relation to abilities of other animals.

(Man: Come on get up, we're gonna go to the monkey room!)

JA: So she began the baby development lab, which is filled with toys, and on any given day, five or six *really* tiny kids.

(Woman #1: How old is she?)

(Woman #2: She's six months.)

(Woman #1: And who's this?)

(Child: I'm a big kid.)

JA: Toddlers too.

(Woman: How old are you?)

(Child: Three and a half.)

(Woman: Three and a half, that's big time.)

JA: So, at a certain point, Elizabeth Spelke decided to build a version of the *white room* in this lab, because she wondered, if rats have so much trouble connecting the idea of left to blue, what about uh...

ES: Surely...

JA: Baby humans!

ES: A self respecting, eighteen month old human *child* will succeed in putting them together, but...

(Child: No!)

ES: (*laughs*) What we find is that children behave just like the rats.

JA: Just like the rats.

ES: Just like the rats.

RK: Really?

JA: Just like the rats? Or, almost just like the rats?

ES: Well... we don't test them with food, we don't test them with digging...

RK: (*laughs*)

ES: ...so in superficial ways, superficial features of the studies are different.

JA: But she says kids, like the rats, cannot connect the idea of left to the idea of blue, they just *can't* do it, and they *can't* do it at...

(Child: One)

JA: They *can't* do it at...

(Child: Two)

JA: They *can't* do it at *three*...

(Child: Four, five)

ES: And we find that those children start performing like adults around six years of age.

RK: Now I'm interested.

JA: Good!

RK: Something happens at the *ripe* old age of *six*!

JA: It is *shockingly* late, right?

RK: Yeah.

JA: Well something happens at the age of six that suddenly allows the kid to connect concepts like, *left*, to concepts like, *blue*! And the question is, *what*? What happens?

CF: Several people have suggested that one *candidate* for a process that's doing this, is language.

RK: What do you mean it's language? Kids are talking all, certainly at three, four, five, and six they're talking like a...

JA: (*laughs*)

RK: Like a, you know, too much!

ES: But, what they're not, what they haven't yet started to use is spatial language and particularly the kinds of spatial language that adults would use in this situation to describe what they're doing.

JA: And somewhere around the age of six they start to use phrases like...

(Child: *Left... of the blue wall.*)

JA: And those aren't just words that come *out* of the child's mouth. Liz thinks that *inside* the child's brain, what that phrase does...

ES: Is link these concepts together. Clink!

JA: And at that moment...

(Child: *Left of the bluuue wall! [repeats]*)

JA: The child leaves the rats behind.

RK: I can't, I can't, you-sh, that, was that, she doesn't think that kids have that...

JA: Well let me put it to you a different way...

RK: Ok.

JA: And this is my best understanding of what she thinks. They're basic idea is that a child's brain begins as a series of islands. And on one island way over here in the brain you've got, say, color. You can call that the blue island.

RK / JA: *(in a child's voice)* Blue, blue, blue, blue, blue, blue, blue, blue!

JA: That's the part of you that perceives the color blue! Way on the other end of the brain you've got the part of you that perceives *spatial* stuff, like left.

RK / JA: *(in a child's voice)* Left, left, left, left, left, left, left, left!

JA: Maybe a third objects like wall...

RK: *(in a child's voice)* Wall, wall, wall, wall, wall, wall!

JA: These things are there from the beginning, but they're separate. Then you get the words, left, blue, wall, and then the child for the first time comes upon the phrase...

RK / JA: Left of the blue wall!

JA: And in that moment, all the islands...

(Child: Kabloom!)

JA: Come together!

(child laughing)

JA: "It is literally the phrase itself," she says, "that creates that internal connection!"

ES: Everybody has always talked about how language is this incredible tool for communication that allows us to exchange information with other people so much more richly and effectively than other animals can. But, language also, seems to me to serve as a mechanism of communication between different systems within a single mind.

JA: There you go.

RK: Wouldn't it be just as possible, just listen to me here...

JA: Mm hm.

RK: That the kid's *brain* is developing some new connections, and what follows then, follows from the changes in the brain!

JA: So the words are like an after, after...

RK: Yeah! After!

JA: After fact?

RK: After effect.

JA: Yeah well that's a good, that's um, no, no.

RK: (*laughs*)

JA: Experimenters actually accounted for that.

CF: Well what the experimenters did next, is that they thought, ok, language is adding this extra element, let's try and knock it out.

JA: How would you do that? Would you like shoot something into their brain that kills the language part or something?

CF: Um, there's a much simpler way of doing it, and a much more humane thing you can do. (*laughs*)

ES: What we did, is put adults in the room.

JA: And then she said she gave them an iPod.

ES: They've got headphones on.

JA: Playing through those headphones is someone talking.

ES: Yep.

JA: And their job, while they're in the room is to just repeat what the person is saying.

ES: *Continuously* listening to speech and repeating it the whole time while they were in there.

CF: It's actually a really hard thing to do. If you have ever tried shadowing somebody speaking and if you try..

JA: Can we, can we try it?

CF: *(laughs)*

JA: You go, and I'll, and I'll shadow you.

CF: Ok, Jad, I'm gonna try start speaking now and I want you to say it right back to me *exactly* as I say it, and without any hesitations!

JA: *(overlapping CF):* Ok, Jad, I'm gonna, gonna start speaking now, and now, and I want to say it right back to you exactly as... Oh my god it's starting to hurt my head! *(laughs)* That's really hard, actually!

CF: It is hard, yeah. And what that does, is it *knocks* out your capacity to use language for yourself.

ES: Basically *battering* the words out of the, uh, adult's head.

RK: Why are they doing this again?

JA: Well they want to see, like, if you *blast* the words out of somebody's head..

ES: What would happen?

JA: Can they find the biscuit? Will they be able to form that simple thought, left of the blue wall? Or will they be like the rats, and can't? And?

ES: And, we actually got very dramatic results.

CF: They went right back to being like the rats.

RK: Wow!

CF: Yeah.

JA: But Charles, what I'm wondering is if language allows you to construct a thought that is so basic as, the biscuit is left of the blue wall, what is thought without language?

CF: Well I don't think it's very much at all.

JA: What do you mean?

CF: I'm going to put it in a different way, and this involves making quite a controversial statement. I don't think very young children *do* think.

JA: Like think period?

CF: (*laughs*)

JA: Was there a period at the end of that sentence?

CF: I don't think they think in the way that I want to call thinking, which is a bit of a cheat, but let me say what I mean by thinking (*laughs*)...

JA: (*laughs*) Ok.

CF: If you reflect on your own experience, if you think about what's going on inside your head as you're just walking to work or sitting on a subway train, much of what is going on in your head at that point is actually verbal. I'm going to suggest that the central *threat* of all that is actually language, it's a stream of inner speech. That's what most of us think of as thinking.

ES: *Well...* on the other hand, what I'm most aware of when I'm reflecting is the stuff that I can't put into words. I think that he's exaggerating the role of-of language here..
(*fades out*)

JA: This all really hinges on how you would define... thinking? And Liz would say, "Take a musician." Like, I'll give you my example, Bill Evans. (*piano*) Here is a form of thought that carries you through... a definite sequence of phrases, feelings, emotions, changes! ...and there are no words!

ES: But there's *something* that we get access to when we gain a full natural language that we can use not only to

communicate with other people, but with ourselves! Language is fundamentally a combinatorial system.

RK: As we head up the steps, where, what is this? This is a, we're going to Columbia University.

JA: (*overlapping RK*) We're going to Columbia University. See, we'd gotten interested in the last thing that Liz Spelke said about language being a combinatorial thing?

ES: System.

JA: Right, and... that lead us to Columbia!

RK: Uh, um, Here's the deal, you have words now, you have words in *combination* now. Now you can play with the combinations.

JA: And that...

(Man #1: You need one more?)

JA: As you'll hear.

(Man #1: Just us three then, right?)

(Man #2: It's just us three.)

(Man #1: Good.)

JA: Opens up... a kind of infinity.

**(Man #1: "Head to foot
Now is he total gules, horridly trick'd
With blood of fathers, mothers, daughters, sons.
Baked and impasted with the parching streets,
That lend a tyrannous and a damned light
To their vile murders.")**

Man #1: This is Shakespeare, when I said in middle school, and they gave us Shakespeare.

**(Man #1: "Roasted in wrath and fire,
And thus o'er-sized with coagulate gore...")**

Man #1: I was *completely* confused, and I felt stupid.

JA: Can you just introduce yourself, uh...

Man #1: This is James Shapiro, I'm, uh...

RK: He is a, uh, Shakespeare scholar, obviously.

James Shapiro: At Columbia University where I've taught for, uh, twenty-five years!

RK: And, one reason he says that Shakespeare can be... confusing? - is that often Shakespeare behaved not so much like a writer but more like a...

JS: Like a *chemist... combining... elements!* (*chuckles*). He's taking words, and he's shoving them together, smashing them together if you will, *combining...*

RK: And, sometimes these word experiments; they didn't go so well.

JS: There's, "*The princes orgulous...*" Orgulous has not...

RK: No...

RK / JA: (*laughter*)

JS: ...That goes in the...

JA: What does it mean?

JS: You got *me!* I mean I should know I taught it... (*fades out*)

RK: But look what he did just by adding a little prefix, *un.*

JS: There's so many words that we're now familiar with: "*unnerved,*" you know, we all know what that means, but nobody had heard: "*unnerved, unaware, uncomfortable...*"

RK: He made up, "*uncomfortable?*"

JS: He was the first to use that word.

RK: On a stage.

JS: Right. (*pages turning*): "unearthly, unhand, undress, uneducated, ungoverned, unmitigated, unwillingness, unpublished," something that's near and dear to me...

RK: "Unpublished..."

JS: "Unsolicited, unswayed, unclog, unappeased, unchanging, unreal."

RK: He made up, "unreal?"

JS: He's the first to use it in print or on stage.

JA: Would an audience that time have understood what the *un* prefix meant? Not real?

JS: I think it takes you a split second... (*unnnreaaaal*) to kind of put that *un* on the *real*.

RK: But then, suddenly you've got this new concept that there's something *real*, but, *not*.

JS: He's taking words that ordinarily, are *not stuck together*. Things like, "*madcap, ladybird*," shoving them together, "*eyedrops*," to achieve a kind of atomic power. (*pages turning*): "*eyesore, eyeball*..."

JA: He did, "*eyeball*?"

JS: Yes.

RK: That's hard to understand that how that, someone could think of that up, eh, it seems like it's always been there.

JS: If you ask me what his *greatest gift* is, is putting them together into phrases that have stuck in our heads. So, "*truth will out*..."

RK: "*Truth will out*..."

JS: "*What's done is done!*" I could go on, and on, and...

JA: (*overlapping JS*) Go on and on!

RK: (*overlapping JA*) He wants you to go on and on!

JA: (*overlapping RK*) Go on and on!

JS: *"Crack of doom," my favorite, "dead as a door nail, a dish fit for the gods, dog will have his day, faint hearted, fool's paradise, forever and a day, forgone conclusion, the game is afoot, the game is up, Greek to me, in a pickle, in my heart of hearts, in my mind's eye, kill with kindness," (sighs) believe it or not, "Knock, knock! Who's there?"*

RK / JA: *OHHHHH! (laughter)*

JS: *Laugh yourselves into stitches, "Love is blind, what the dickens?, all's well that ends well, ...something wicked this way comes," and, "a sorry sight."*

JA: *Wow! (laughs)*

RK: *That's a champion (laughs).*

JA: *That's pretty fantastic.*

JS: *How did he create phrases that stick in the mind; that make it seem as if they always existed?*

RK: *Yeah, how? You're taking out a book.*

JS: *Thinking of a passage here...*

JA: *That is maybe the biggest book I've ever seen.*

RK: *(laughs)*

JS: *Nonsense!*

JA: *It was at least three-thousand pages.*

JS: *Shakespeare doesn't write a lot about process, but there are one or two places where he does in a poem called, *Lucrese*, in which a woman is, uh, raped, *Lucrese* is raped, and she has to write a letter to her husband explaining what happened to her, and she's struggling to, um, to find the words in which to do this, and finally she picks up the pen and it goes... (page turns):*

*"...she prepares to write,
First hovering o'er the paper with her quill:
Conceit and grief an eager combat fight;
What wit sets down is blotted straight with will;
This is too curious-good, this blunt and ill:*

*Much like a press of people at a door,
Throng her inventions, which shall go before."*
I'll read that couplet again,
*"Much like a press of people at a door,
Throng her inventions, which shall go before."*
If you want to extrapolate from this, something that Shakespeare might have himself experienced. You have a situation which all these ideas are *pressing*; it's like a *throng* of them; who's getting through that doorway first?

(noisy crowd)

JA: It's a little bit maybe, like that experience you might have at a... nightmare New York club, where you've got like *thousands* of people in a... *tiny* space, and everyone's trying to *push* their way out, and they're like, "God! Let me through the door! Get out of my way!" And it's just like this...

JS: *Throng* of images, of sounds, conceits of thoughts, ideas, and, and, and they are providing the *pressure* that's needed to produce... words.

JA: You know what?

RK: What?

JA: This makes sense to me... this interpretation. Not-not just for Shakespeare, but for anybody. Certainly the guy we met at the beginning, Ildefonso.

RK: Who just, who just learned words for the first time.

JA: Yeah, I mean as you move through the world, if you're sensitive at all, and you're observant, you're gonna get *filled* up with all of these things which you... *have* to express but *can't*, until you get those words. Then, *boom!* The door opens.

RK: And thanks to James Shapiro, professor at Columbia University who's newest book is, *Contested Will: Who Wrote Shakespeare?*

JA: Also, thanks to our kids, Louisa Krasnow, Stella (?), and Isaiah Harrison, and also thanks to the moms that

brought them in! Therese Tripoli, Carrie Donaghue, and Patricia Starek.

(answering machine inbox):

*(*beep*)*

(SS: Hello! This is Susan Schaller. Radiolab is funded in part by the Alfred P. Sloan Foundation.)

(CF: Charles Fernyhough. Radiolab is produced by WNYC and distributed by NPR.)

*(*click*)*

JA: Hey, I'm Jad Abumrad.

RK: I'm Robert Krulwich.

JA: This is Radiolab. This hour...

RK: *(overlapping JA)* Now, we're talking about...

RK: / JA: *(mumbling)*

RK: Words.

JA: Power of words.

RK: So, once words *enter* your head, once they tickle in there and we just explained how that happens...

JA: Sort of.

RK: Then they, I don't know, they're always *there*, like I don't...

JA: But what if they're not? What would happen, if that, oh, that *throng*, that is in your head...

(cheering)

RK: *(laughs)*

JA: What if all of that stuff, whatever is in your head, suddenly went...

(poof)

JA: Got yanked right out of your head.

RK: Mmmm.

JA: What would be left?

RK: Well, this got us thinking about a very famous talk... at the - one of the TED conferences?

(Woman: I grew up to study the brain...)

RK: A talk given by a neuroanatomist, Jill Bolte, is it Bolte? Or bolt?

JA: Bolte?

RK: Bolte Taylor.

JA: Yeah.

RK: And all you really need to know is that one morning in December of 1996, Doctor Taylor woke up and she had, she had a headache.

(Jill Bolte Taylor: I woke up to a pounding pain behind my left eye, and it was the kind of pain, caustic pain that you get when you bite into ice cream, and it just gripped me, and then it released me, and it was very unusual for me to ever experience any kind of, of pain so I thought, ok I'll just start my normal routine. So I got up and I jumped onto my cardio-glider which is a full body, full exercise machine. And I'm jammin' away on this thing, and I'm realizing that my hands look like primitive claws grasping onto the bar, and I thought, whoa! I'm a weird looking thing! [audience laughter] So I get off the machine, and I'm standing in my bathroom getting ready to step into the shower, and I lost my balance and I'm propped up against the, the wall, and I'm asking myself, what is wrong with me? What is going on? And in that moment, my right arm went totally paralyzed by my side.)

*(*click*)*

RK: In fact a blood vessel in the left hemisphere of Jill's brain had... popped. And that part of her brain was starting to shut down.

JA: And it was the shutdown, that really caught our attention.

(JBT: In that moment, my brain chatter went totally silent. Just like someone took a remote control and pushed the mute button... So here I am in this space, and my job, and any stress related to my, my job, it was gone, and I felt lighter in my body. Then all the sudden my left hemisphere comes back online and it says to me, hey! We're having a stroke! We gotta get some help! [audience laughter] And I'm goin', ahhh! I got a problem! I got a problem! So it's like, ok, ok, I got a problem, but then I immediately... drifted right back out [audience laughter]. And I affectionately refer to this space as la-la land. But it was... [fades out])

JBT: I'm just watching my brain become more and more, uh, um, incapable of functioning.

RK: That is Jill Bolte Taylor herself.

JBT: Hi Robert.

JA: We actually got her into our studio.

JBT: Hello Jad.

JA: Hello. 'Cause we want to ask her some questions about that moment when her inner voices went away.

RK: So lets, lets talk about brain chatter for a moment.

JBT: Mm hm.

RK: In, in the story that we've told so far, you're still asking yourself questions.

JBT: Yeah.

RK: Now did that stop?

JBT: It, it, wh - on the morning of the stroke, I was doing this wafting dance between the right hemisphere and the left hemisphere, so language would come back on. But once I got to the emergency room and I passed out, when I awoke later that afternoon, I had absolutely no language.

JA: Did you know... your name?

JBT: No.

JA: Did you know your address?

JBT: No.

RK: Did you know about your summer from 1983?

JBT: No.

JA: Did you know, like, my mom is so and so?

JBT: I didn't know any of that.

JA: None of it.

JBT: I didn't know any of that.

RK: Just imagine, she's lying in her bed, her head is shaved, *wrapped* in bandages, she's had hours of brain surgery, she's got tubes coming out of her mouth, out of her nose, she's lost her career, she's lost her language...

JBT: And I lost all my memories.

RK: And, *yet*, she says, sitting there in that suddenly wordless space...

JBT: I had found a peace inside of myself that I had not *known* before. I had pure silence inside of my mind. Pure silence.

JA: Pure *silence*?

JBT: Pure *silence*.

JA: What was...

JBT: You know not that little voice that, that you know you wake up in the morning and the first thing your brain says is, *aw*, man the sun is shining. Well, imagine that you don't hear that little voice saying, man the sun is shining, you just *experience* the sun, and the shining.

RK: Does, is this the a-absence of *reflection* of any kind?

JA: Yeah...

RK: Is it just sensual intake and... period?

JBT: That is exactly what it was, it was, it was all of the present moment.

JA: Did you have... *thoughts*?

JBT: I had joy.

RK: (*laughs*)

JBT: I had a, I just had *joy*, I had, I had this magnificent experience of, I'm this collection of these *beautiful* cells, I'm *organic*, I'm this, this *organic* entity...

RK: (*overlapping JBT*) Did you have a Dead-head period by any chance?

(JA and JBT laugh)

JBT: (*laughs*) You know I, I *missed* that by a few years, but I get a lot of that.

RK: And, and the other thing that she told us, is that *lying* in that bed without words, she says she felt *connected* to things, to *everything* in a way that she never had before.

JBT: Oh yeah. I lost all definition of myself in relationship to everything in the external world.

JA: You mean like you couldn't figure out where you... *ended*?

JBT: Mm Hm.

RK: How much of that was, was *about* language? A little part? A lot? I mean...

JBT: Well I would say it was huge. Language is an ongoing information processing. It's the constant reminder. I *am*. This is my name. This is all the data related to me. These are the, my likes and my dislikes. These are my beliefs. I am an *individual*. I'm a single. I'm a solid. I am *separate* from you. This is my... (*fades out*)

JA: Now, as fruity as this may sound, to pin all this on language, we have run into this idea before. A couple seasons ago, uh, Paul Broks, remember him?

RK: Yeah, sure.

JA: Neuropsychologist...

(Paul Broks chatter)

JA: He told me that there's a theory out there, which she believes actually that *all* a person is in the end, like all the personhood of a person, the *I* or the *you* of a person, all that is, in the end, is, uh...

(Paul Broks: A story.)

JA: A story you tell yourself.

(PB: What we normally think of when we think about ourselves is really a story. It's wh - it's the story of what's happened to that body over time.)

JBT: I did not have that portion of my language center that tells a story.

(JBT: Curious little Jill. Me, Jill Bolte Taylor climbing the Harvard ladder. Through language... Love's dissection, cutting up things...)

JBT: That language was gone. I got to essentially become an *infant*...

(infant starting to cry)

JBT: Again.

RK: I mean this is the problem here.

JA: Wh - what do you mean?

RK: When you drop out of the *I-ness* of yourself or the story of yourself, then you are left... she says, at peace. I could argue that that's just *stranded*. That's stranded in the sunshine with the wind in the now.

JA: But I mean it's not like she stayed there.

RK: (*laughs*) Well that's true though.

JA: We wouldn't be talking to her if she had. And as she started to recover, she ran into something kind of interesting, which *sounded* to me sort of like what maybe the rats and the babies go through in the white room? She would have these desperate thoughts and then... stall out, like she couldn't bring them together.

JBT: Yeah. When, when people would speak to me. I would, I remembered in pictures, so um, if somebody would ask me, "Who's the president of the U - of the United States of America?" This is a *huge* question. So for the next several hours I'd be pondering, president, president, president, what's a president? And then I would get a *picture* in my mind of a president as a leader.

JA: Was it a picture of a specific *guy*?

JBT: It's, it was actually, it still flashes into my mind, it's, it's a picture of a, of a, silhouette of a male.

RK: A presidential profile.

JA: Like maybe the *idea* of a president, basically. So that was her president.

JBT: Then I had to figure out a *United States*. And so, eventually I'd come up with this *map* in my mind, this *picture* of the United States... (*fades out*)

JA: Like a line drawing. So now she's got this *map*, she's got this silhouette of a *guy*, and she said, after *hours*!

JBT: President, United States, president, United States, and I was like, oh my *god*!

JA: She still couldn't somehow *bring* them together.

RK: Yeah.

JBT: And I didn't have the road that I had to travel in, in order to come up with, um, I think it was Clinton at the time. Yeah it was Clinton at the time.

JA: Now as Jill starts to get better...

JBT: This is after eight years of hard work and recovery and... (*fades out*)

RK: *Finally*, the words start to trickle back.

JA: And when they did, she says, that silence that she loved so much, got pushed out.

JBT: That was one of the sacrifices. For me that was one of the sacrifices.

JA: Well.

JBT: (*laughs*) (*mimicking JA*) Well.

RK: (*laughs*) We're doing a, we're doing a *language* show here and you're the *anti-queen* of our language show! You're like saying, *who* needs it!? What the hell!?

JBT: No! No, no, no, no! No... but what I *am* saying is that in order for us to communicate with language, we pull ourselves away from a different kind of experience. I do believe that there are times when you need to let your, your brain chatter be quiet.

RK: But is it *fair* to say... this is a, please *agree* or *disagree* with this statement...

JBT: (*laughs*)

RK: I, I think, that *words*, and *language*, and *grammar* are *necessary*, but not *half* as good as *wind* in my hair, a smell in my nose, and that whole right brain, sensual immediacy.

JBT: (*laughs*) *Yeah*... you know if, um...

JA: (*laughs*)

JBT: If I had to choose, which is essentially what you're saying. If I had to choose, um... that would be a really really really tough decision.

JA: Jill Bolte Taylor is the author of, uh, what's it called? The book...

RK: *My Stroke of Insight*

JA: Yes. Check our website, radiolab.org for any details, and if you subscribe to our podcast, there is a bonus video that goes along with this hour, and it's pretty great.

JA: I'm Jad Abumrad.

RK: Robert Krulwich.

JA: This is Radiolab, our topic today..

RK: Words.

JA: Power of words, of language. Ok, so Nicaragua, 1970s, that's where our next story starts. You with me?

RK: Mm hm.

JA: So imagine you're a kid that's deaf in Nicaragua at this time.

RK: *Born* deaf? Or, or...

JA: Born deaf.

RK: Born deaf.

JA: You've always been deaf and you're the only one in your *family* that's deaf.

RK: Hmm.

JA: So you're in this situation where everybody is talking, their mouths are moving, you can't hear it, and you don't know sign language, 'cause no one has taught you.

RK: There was *no* deaf school in Nicaragua then?

JA: Nothing.

RK: Ok.

JA: No deaf education of any kind so, if you were with this kid, all you really got are a couple of gestures, really crude gestures you've worked out to talk to your family and friends, but beyond that, you're cut off. Like Ildefonso, the guy we met at the beginning of the show, except in Nicaragua in the 70s there were *hundreds*, maybe *thousands* of these Ildefonsos.

RK: Really?

JA: Yeah. But then, everything changes!

Woman: In the late 70s, Hope Somoza, who was the wife of the then dictator, established a new school for special education. I think she had someone in her family who had a disability, not deafness.

JA: But the school would include deaf people, and that, says psychology professor Ann Senghas, was a first! 'Cause now instead of deaf kids scattered about, they were *together...* in the same *room*.

Ann Senghas: There were fifty deaf kids in that first entering class.

JA: Preschool to sixth grade.

AS: In the late 70s.

JA: And for most of them, this is the first time they had ever met another deaf person.

AS: Before, the world was going on around them and everyone was all talking and they were cut off from that. And suddenly for the first time, they were all there and they were... what was happening and they were... what there was to talk about.

JA: But, they didn't have a way of talking. These were fifty different kids who'd never learned a language, and had fifty different sets of, like, rudimentary *gestures* that they used.

RK: Whoa! That must've been...

JA: Yeah, like fifty people with fifty different ways to try and...

RK: Ask for breakfast...

JA: Or, say they want to go outside, I mean nothing was shared!

AS: It's not like teachers were using sign in the class room. Everything in the classroom was Spanish.

JA: Which none of them knew.

AS: Copying it into their notebooks. A lot of it was going right over their heads... *(fades out)*

JA: So at the beginning, things were *completely confusing*.

AS: *But*, they're riding on the bus for an hour everyday, and they're playing out of recess for an hour everyday, and they're getting together at the park... *(fades out)*

JA: And no one knows how it happened. Like maybe one of the kids who was...

AS: Very charismatic... *(fades out)*

JA: He invented a sign for say, *ball*. Then told it to another kid who was...

AS: Very, you know, socially active... *(fades out)*

JA: And that second kid then spread the sign, however it worked. Over time, the signs that these fifty kids used...

AS: Started to converge into a common system.

JA: And when you step back from it all, what that means?

AS: They... created a language... They, it's, they didn't just take it from somewhere else. They *couldn't* take it from somewhere else. They... created their own.

JA: But how unusual is that?

AS: Like, this has happened with languages all over the world, but *not* while people were watching.

JA: And so you're saying this is the first time we've been able to *watch* a language being born?

AS: Yeah.

JA: Wow. And for the last twenty years that is what Ann has been doing. She's been *going* to Nicaragua, to that school, and watching.

(school bell)

(children screaming)

AS: So, ummm, oh you want to describe the, so I may have gotten a recording of this but when you arrive at the school, *(bus horn, brakes hiss)* the buses come around, the kids are all *screaming* and leaning out the windows and signing to each other, *(children laughing)* and the kids pile out and they line up in rows on the basketball court that's in the center of the school yard, and they all sing the national hymn.

(children singing "Salve a ti, Nicaragua")

AS: And the deaf kids all sign the national hymn, and they all have one hand over their heart and sign with the other hand while the, the hearing kids sing it... *(fades out)*

JA: Ann visited the school for the first time in 1990, about ten years after it was formed. She'd been working at the time with a linguist.

AS: Named Judy Kegl.

JA: Studying basic linguist type stuff.

AS: Right, trying to figure out how the *verbs* work, and whether they have agreement with their grammatical objects... *(fades out)*

JA: And along the way, her and a collaborator, Jennie Pyers, stumbled into something... *really* surprising about the power of *certain* words. To set it up, when she *got* there, the first time in, to Nicaragua, those original fifty kids who'd invented this thing... had grown up already and there were these younger generations of kids coming in behind them, *growing* up with the language, *using* it, *inventing* new

signs, and at a certain point, she got curious, to just compare the original signers, the older kids, to the younger kids!

AS: Yeah.

JA: In terms of how they sign.

AS: *(laughs)* So we show everyone this little one minute cartoon about this guy who's trying to fly. He sees a bird flying and he puts all these feathers on his body and climbs up to the top of a mountain, flaps his arms, and jumps, and crashes on the ground.

JA: So she showed deaf kids of different generations this cartoon and asked them pretty simply to describe..

AS: What they saw.

JA: Just describe it, in sign.

AS: Describe the whole story.

JA: The differences... were striking.

AS: Well um...

JA: First of all...

AS: So I'll just show you an example of each.

JA: So you're opening up a movie here...

AS: So this is the first (?) signer talking about... *(fades out)*

JA: She got out her laptop and showed me some video. First, of this woman in her, her 40s with, with dark hair in a colorful t-shirt. She was one of the original signers, and when you see *older* signers like *her* describe this guy who's trying to fly, it's really spastic, it's almost like they become the cartoon, and she's flapping her hands, moving all around.

AS: A lot of full body movements, she's talking about someone who's moving in a crazy way, she's gonna be moving in a crazy way. And um... *(fades out)*

JA: Then she showed me a, a young kid who was about eight with a backwards cap.

AS: So here's Sylvester, and now he talks about the man...

JA: When he described the man jumping and then falling, it was *all* in the wrist.

AS: *All* the movement is now in the hand, and it's very...

JA: Stylish!

AS: (*laughs*) You know, they're trimming these signs down... (*fades out*)

JA: But more to the point, there was *one* thing she noticed, that was *really*... unexpected, it had nothing to do with movement.

AS: I couldn't help noticing that they, the people, different people in the community *talked* about different things in this story. The older signers tended to describe all the events in this story.

JA: And only the events.

AS: And the *younger* kids...

JA: They would talk about the guy's feelings.

AS: That this guy was trying to fly, wanted to fly, but failed.

JA: The kids, she says, just seemed to be better at...

AS: Thinking about...

JA: Thinking.

AS: Thinking.

JA: Like, *other* people's thinking. So Ann and Jennie decided, lets take *all* the different generations of deaf kids...

AS: Forty year olds, thirty year olds, twenty year olds, ten year olds... (*fades out*)

JA: Let me test them on how well they can... think about *thinking*. So what they did was they showed everybody a comic strip, different from before. This one was about two brothers.

AS: There's a big brother who's playing with a train and then the little brother is, like, wanting to play with the train and the big brother is playing with the train, and then the big brother puts it under the bed and goes into the kitchen to eat a sandwich.

JA: And maybe before he goes he looks at the little brother and says, "Hey! Don't touch my train. Don't touch it!"

AS: And then, little brother, while the big brother is out of the room, takes the train out and hides it in the toy box. And then the big brother comes back and the question is, where's the big brother gonna go to find his train? Is he gonna look under the bed? Or is he gonna look in the toy box?

RK: Well, he's gonna look under the bed!

JA: Yep.

RK: Because as far as he knows, that's where he left it!

JA: Yeah!

AS: He didn't see it move.

JA: And if you ask kids over the age of five, most of them would say, he's gonna look under the bed, because that's where he left it and he doesn't *know* that it's been moved to the toy box. But here's the thing, when she asked the older signers...

AS: They would say, "Oh, he'll look in the toy box."

JA: *Really?*

AS: They would pick the wrong one. These are thirty-five year olds...

JA: Thirty-five year olds would get this *wrong*?

AS: They would fail this task, yeah.

JA: Seven out of *eight*, she says.

AS: And then *all* of the younger signers that we worked with passed.

JA: At this point she's just confused, like, *why* would this be? Why can't the older people pass this simple test? You know, that involves thinking about someone else's *thinking*? What's going on here? And then it occurred to her, it might have something to do with certain words, because, the older signers, they don't really have that many words for the concept of...

AS: Thinking.

JA: I mean, they have mainly just have one sign: pointing at your forehead.

AS: Yeah.

JA: Basically you just point at your forehead with your index finger. By the time you get to the younger kids, they've got *tons* of words for thinking.

AS: Things like, "I know something and I know that you don't know it,"

JA: "I know something and I know you *do* know it," they've got a sign for, *understand, believe*...

AS: *Believe, remember, forget*...

JA: How many roughly, were there?

AS: Ten or twelve.

JA: Wow. So from thirty years we go from just a couple to...

AS: Well we went from like knowing and not knowing, right.

JA: To *twelve*?

AS: Yeah.

JA: And somehow that makes all the difference she says. The more of these *think* words you've got, the more you can think. Am I right to say that? You're tip-toeing toward that. But maybe you don't want to go there all the way?

AS: Yeah, I'm trying to think that, I guess I, I don't think it's so *simple* that you could just go in and say, "Hey I'm gonna teach you ten signs today and now suddenly you're gonna have better cognitive capacity."

JA: But you are *saying* though that the verb, *think*...

AS: Uh huh.

JA: Is *somehow* implicated in my ability to think about your thinking.

AS: Right... Thinking about thinking. Understanding how other people understand. That's something that *having* language makes you better at.

JA: There are certain words, she says, that don't just give you a name for something. Somehow, they give you access to a concept, that would otherwise be *really* hard to get, or even talk about! It's really hard to talk about *thoughts*, without the word, *thoughts*. Or what is *time*, without the word, *time*. It's a really freakin' hard concept. These words are like bridges. Somehow they get you to some new mental place, that otherwise you'd be cut off from. But that's sad though, I mean these young kids *have* something that the people who actually invented the language *don't*.

AS: *But*, we went back, two years later, tested the same people, and then suddenly some of them were performing a lot better than they had the two years before on the same kinds of tasks.

JA: You mean the older signers?

AS: Yeah.

JA: They were passing suddenly?

AS: Some of them were passing, yeah.

JA: With, what happened?

AS: What happened in the past two years?

JA: Yeah!

AS: Those *younger* kids grew up and started hanging out at the deaf association!

JA: Wait, what?

AS: (*laughs*) So, what had happened in the meantime... (*fades out*)

JA: So, here's the strange twist to the whole thing: The deaf association is this place where the older signers would hang out.

AS: Yeah, it's a social club.

JA: So they'd play chess, do whatever. Well, at a certain point, these *youngsters* start showing up, you know, 'cause they've graduated and they want to hang out at the deaf association too, but they bring with them all of their new...

AS: Mental verbs.

JA: You know, all of these words for *thinking*. They start using it with the older kids. The older kids pick it up. Suddenly these *older* kids are now... passing the test!

AS: So, there was *learning* that took place in adulthood that actually gives them new insight into other people's thinking, and motivation, and now they can pass these tasks.

JA: That's super interesting.

AS: (*overlapping JA*) So *that's* the story. It's really cool!

JA: Ann Senghas is an associate professor of psychology at Barnard College in New York.

RK: The thing of course you wonder, you wonder is, uh, once you've *gotten* these, this new *facility* in you, like, there's a lot of literature about this, *My Fair Lady* is about this...

JA: *My Fair Lady* is about this?

RK: Yeah! It's about a, a woman who learns, uh, proper English, and she can no longer be a *flower girl* in Covent Garden and she is now a *lady*.

JA: (*overlapping RK*) Oh... yeah I guess it is kind of like this.

RK: You want, like, remember? Our program began with the story of Ildefonso.

JA: Right, which we heard from Susan Schaller. Ildefonso, was the guy, who for twenty-seven years had no language at all.

RK: So you kind of wonder, like *what* happened to Ildefonso once he *got* language?

JA: Right. And after that first breakthrough where Ildefonso realized things have names, Susan ended up leaving for a few years.

SS: Let's see, it was, uh, about four years I think, four or five.

JA: But then, she decided, to write a book about him.

SS: And so, I, um, I went and found him again. And he had *language*, and I could ask him all kinds of questions.

JA: Were you able to then sit down with him and ask him about his life? And really get the, sort of his biography?

SS: Somewhat, somewhat. One, um, area that everyone wants to know about is, what was it like to be language-less? You know, what was going on in his head?

JA: Yeah.

SS: And I asked, and I asked, and I asked, and he starts telling me, that was the *dark* time in his life. Learning language is, is like the lights went on. And I tell him, well we *know* about language and we want to know what it's like *not* to have language. And he doesn't want to talk about it.

RK: But there was a day she says when she was writing the book and she met Ildefonso in a restaurant and there he was sitting with his brother Mario, who she'd never met before, and she quickly learned that Mario *also* was deaf.

SS: And language-less.

JA: Really?

SS: So I was shocked. And because I was so amazed, going, I, I can't believe you have a language-less brother. That's when um, when Ildefonso said, "Well, let, let me introduce you to some of my friends."

RK: So, they get in a car and they drive for a while.

SS: We stop at this apartment, we walk into this small little room, and there were these six Mexican men doing this *mime* routine.

JA: Wait, *all* these guys were like Ildefonso used to be?

SS: They had no language!

JA: Wow.

SS: They were all born deaf and they didn't know they were deaf.

JA: And what, what were they doing?

SS: One man would stand up and he would start miming, he would just start acting out a bullfight. So he'd be the bull and he'd be charging, and then he'd be the, um, matador, and then he'd be somebody in the crowd watching, and then he would add a detail.

RK: For example?

SS: A hat.

RK: And they'd swap, so another guy would get up and take over the story.

SS: And they'd start miming.

RK: They'd reenact the matador.

SS: Describe the hat.

RK: But now the second story teller would add a *new* detail.

SS: Like, another person with a pair of glasses or something.

RK: So each one would stand up, take the bullfight, the *same* bullfight to a *different* point and add a detail.

SS: (*laughs*) Exactly! Exactly!

RK: Oh my god.

SS: In other words it would take them maybe *forty-five minutes* to say, "Do you remember the time when we were at the bullfight and this woman did such and such?"

JA: Hm, wow.

SS: It was like drawing a picture.

RK: Well let me ask you, uh, uh, a pull it all together question: I was about to think, that what a language is is a great connector, but this last story makes me wonder. These are *five* men, *really* sharing and connecting on details. So is the difference language makes just *efficiency*? Or does it affect your heart? Or your whole way of, I - I can't tell, I'm not sure anymore.

SS: Well, I'll, I'll give you Ildefonso's answer, which when I saw him, um, a couple years later after this incident I asked him about his friends, and he said he couldn't talk to them anymore. He, he wasn't willing to go through all that tedious effort of all the miming anymore. But the interesting thing that he said was, he can't even *think* that way anymore. He said he can't *think* the way he used to think. And when I pushed him to ask about what it was like to be language-less, he, he, the closest he ever came to any kind of an answer was exactly that, "I don't know, I don't remember... I *think* differently now."

JA: Susan Schaller is author of the book, *A Man Without Words*. Go to radiolab.org for more info and if you go there, or if you're subscribed to our podcast, you'll get this automatically, but there's a *beautiful* short film directed

by two really talented guys, Will Hoffman and Daniel Mercadante, that is all about... words!