Science AMA Series: I'm Shelly Jo Kraft, an assistant professor at Wayne State University. I'm here to talk about, and invite you to participate in, my study on the genetics of stuttering. AMA!

Hello reddit! I'm Shelly Jo Kraft, an Assistant Professor at Wayne State University. My research focuses on the biological and behavioral genetics of stuttering. I also work on studies that investigate neuro-anatomical and functional features of people who stutter, auditory feedback mechanisms of speech control, and new genetic analysis techniques for modeling epigenetic complexity. Clinically, I am interested in the relationship between cognition, temperament, and stuttering severity. Stuttering is a developmental speech disorder that affects 1% of the adult population, and 5-6% of the child population world-wide. To date, the genes responsible for the disorder have yet to be conclusively identified in the general population. Only a small number of studies have been conducted on the genetic susceptibility of this disorder. I am leading a new study, to discover more about the genes and biological mechanisms that increase risk of stuttering. To identify these genes, we are working to collect as many saliva samples as possible from people around the world who stutter. I can answer any questions you might have about developmental stuttering, how we know it is genetic, and about participating in the study. If you want to participate, the first step is to read and fill out these forms about the study. Next, we will schedule a short phone call interview with me or another qualified speech and language pathologist. After that, we will mail you a saliva collection kit and a very brief questionnaire. Our understanding of the cause of stuttering will potentially provide a foundation for new treatment approaches. Please join me in this international effort!

Thank you so much for your excellent questions! I really appreciated your enthusiasm for this exciting area of research, and your support for our study. I would also like to thank everyone who shared a personal anecdote of their experience as a person who stutters. I will try to come back later tonight to check in and answer any additional questions that come in.

Thanks again!! [https://wayneState.az1.qualtrics.com/SE/?SID=SV_022laHz6j23fGex](https://wayneState.az1.qualtrics.com/SE/?SID=SV_022laHz6j23fGex).

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i didn't start having a sporadic stutter until i was around 22. its sometimes a random tongue tying nothing big. but every now and then i simply cant get the word out of the mouth and even my mind stutters the word in sync with my mouth. i stop and grit my teeth for a second then i can focus the word out. i was in the army at that time and had gotten back from iraq. my experiences weren't overly traumatic and i did hit my head very hard that i can remember. is it an age thing?

shad554

Great question! Most likely you stuttered as a very small child as well. I see stories similar to yours more frequently that you might expect. What we assume, is that you stuttered very mildly as a small child (likely age 2-3) and in the midst of normal speech development bumbles and mis-articulations, no one noticed. Your stutter may have became even more mild for years and you didn't notice it. We know
that stress can exacerbate stuttering. We also know that stuttering fluctuates throughout a lifespan for most people, so you might just be experiencing an upswing! Most people who stutter report their severity getting more mild after age 50.

Are there levels to the severity of someone's stutter? If so, what causes the difference in severity between stutters in different people?

Thank you for your time!

Genesi-S

I am fascinated with severity, as you are. Each person who stutters is unique in type of stutters (blocks, prolongations, repetitions), frequency (how often they stutter), duration (how long the stutter lasts), and secondary behaviors (other things they do during a stutter that is not part of the speech characteristics). These are all characteristics of overt stuttering. People also have covert stuttering severity to consider, which is the part a listener can't see (thoughts, word switching, emotional distress, anxiety, ect.) We have completed two studies on overt severity that have linked a component of temperament/personality called "effortful control" to severity. Effortful control is both voluntary and involuntary. It is the ability to replace an undesired behavior for a desired one. Some people can listen to the radio and read at the same time, they have high effortful control, and we would predict their severity to be more mild. We can control this ability to attend to something, be vigilant, and to modify something our brain naturally wants to do to a certain degree, but there is underlying "that's how you are wired" part that we can't control. Great question!

I stutter and would love to participate. I've read through the study's consent form and saw that it said we won't get any results of our individual test. But will we be notified of the results of the entire study or will that information be made available to the public after?

Also, have you contacted the Stuttering Foundation?

Vighy

Hello! If we find some genes for stuttering you will likely hear about it in the press, especially if you subscribe to journals or newsletters like the one distributed by the Stuttering Foundation! They are a great organization that reports on research and current news for the stuttering community!

As a behavioral scientist, I have always factored in environmental influences after birth as a possible positive correlation for stuttering. Do you have any leads to this "nature" side of the debate? I think it's great that you are looking into this!

tastierpancakes

We have investigated some environmental influences extensively (ie. parenting, chaos levels in the home, significant/truamatic life events), as have other scientists, and found nothing causative. I fully believe there will be environmental influences in concert with genetic influences that contribute to stuttering. These environmental influences are likely to be much more subtle (not your environment in terms of living environment, but nutritional environment, exposure, experiences, learning, behavior and cognition), and have more to do with factors contributing specifically to brain development.

I stutter and my father does as well. How often do you see this trait passed on to children like this?
Also, can you clarify the relationship between stuttering and cluttering? I've only recently heard of this phenomenon.

:edit: cluster->clutter

Alexandre_Dumbass

As a geneticist, and a speech-language pathologist that specializes in stuttering, I see it ALL OF THE TIME! (and it get's me very excited!) We KNOW that stuttering is genetic, because cases like yours happen for generations across the globe. Your example is the exact reason we are hunting down these genes! Regarding your question about clustering, I assume you are referring to cluttering? Cluttering is a fluency disorder that has several specific characteristics: fast rate of speech, clustering of speech sounds, reduced awareness from the speaker that they are not articulating clearly, sentences with many tangents, mumbling, as well as repetitions and revisions. Cluttering and stuttering can co-occur, too!

Oh holy snap, this is awesome! We're in the metro Detroit area and just started seeking services for my 8 year old stutterer.

How did you get started in this field?

absolut_chaos

I got started as a clinician. I fell in love with this mystical disorder that has so many nuances and unexplained characteristics. There is an endless amount of work to be done in stuttering for us to understand the cause, mechanisms, and most effect ways to treat it. Contact me directly or follow the link to get in touch regarding your son!

I've heard of cases of left handed people forced to become right handed developing a stutter, like my uncle, and a few other tales I picked up here and there. What's the mechanism, for lack of a better term, behind this?

bastion72

Scientists don't fully understand the mechanism still today. That is why we are looking for genetic answers to give us a ground-up approach to our understanding. Find the genes, figure out where they express themselves int he brain, understand what they do, and then develop a treatment. As for your uncle, likely this was just chance that he started to stutter while they were also modifying his handedness, and not a legitimate "cause". Stuttering develops between the ages of 2-6 (kids who stutter are slightly more likely to be left-handed btw), which is when many developmental changes are naturally occurring, as well as when children are behaviorally being groomed. I have many parents who worry because their child started to stutter when they got a divorce, had a new baby, changed schools, or moved. These are not causative factors (or nearly all children would stutter) but coincidental in the timeline of life and the typical onset time-period of developmental stuttering. Great questions! Thanks for asking!

How exactly does speech therapy work? I have a friend who has a bad stutter; it almost went away with speech therapy but returned entirely when he stopped going.

Is there any reason seeing a professional makes a difference versus learning habits from a speech therapist and practicing them at home?
The success of therapy is dependent on several things. The therapist, the motivation of the client to change, and the fit of the strategic plan to the individual. When you are working with someone, you are in a mindset to make changes and transfer them into daily living. Sometimes, as listeners, we wish for the person who stutters to be fluent because we perceive that as being "easier". When, in reality, that fluency is hard work for them. It takes a lot of effort to change the way they speak. If you are a friend, then likely they feel comfortable around you and want to just be themselves. I'd take it as a compliment! We as a society have a lot of work to do on acceptance of differences. Great question to ask! Please give your friend the link to participate in this study!

I'm the only person in my family, to my knowledge, who has or has had a stutter. It was severe as a kid, but it's very mild now. I've always considered it to be influenced by being nervous and never thought it to be something that I received genetically. What have you found as far as to how a stutter originates in genes? Also, how does a stutter get passed down through generations? Is the passing down process like physical features or more like being susceptible to an illness?

I signed up to participate in the study, glad to see this happening.

Thank you so much for your participation! Your sample gets us one step closer! Stuttering is NOT from being nervous, we know now that that was only a myth. Several studies in the literature have confirmed this. In regards to you being the only person in your family who stutters, I have this to offer - Only recently in our history have medical records, school records, and developmental milestones been kept. For our grandparents, if they stuttered for a transient amount of time (as 5-6% of the population does) and they don't remember (maybe it was really mild, or they didn't stutter for very long - 2 months, for example), then no one is around to pass that information down to you. We think this is likely the case with those that report "spontaneous" cases. The process is still being investigated, but yes, in the same way both your physical features and your susceptibility to illnesses are passed down, so are several genes that contribute to your risk of developing a stutter. Wonderful questions! Thank you for sharing your story!

Is stuttering always genetic?

I have a relative who had a pretty severe stutter. He was the oldest child, home-schooled, and very sheltered. We always assumed his stutter was more due to a total lack of socializing. If I remember right, he didn't stutter when speaking to his immediate family, but he did to everyone else.

Yes, stuttering is always genetic. We have what we think are rare spontaneous cases, but they still are genetically driven (with environmental contributions, of course). Historically, there have been many myths about stuttering and the cause; temperament was a common one. Research has put that idea to rest. The phenomenon of your relative not stuttering when speaking to immediate family is not uncommon. People who stutter will have speaking situations and people that make it easier to talk fluently, or worse. Stress adds to everyone's fluency whether we stutter or not. Thank you for your question!

I'm fluent in two languages and while I have a mild stutter in one, I rarely stutter in the other. Is that a thing or is it all just in my head (increasingly, I use the language in which I stutter less and less and I've
found that the stuttering has started to occur more frequently? 

**WildBartsCantBeTamed**

This is REALLY common for multilingual speakers! It has to do with the amount of effort (cognitive demand), and novelty, for each of the languages. Cognitive effort can either increase stuttering, or decrease it (each person is different), and novelty usually decreases it. Thanks for asking!

How will the results of your research affect speech therapy? Will it add to it, or are you seeing a whole new direction for helping people who stutter? What do you think either outcome will look like?

Also- thank you so much for this research! My on has a stutter, and we took him to an amazing doctor to be diagnosed so that he could get into in-school speech therapy. She was the first person to tell us that stuttering is neurologically/genetically based, and I am so fascinated by that.

**MrsDrNotSoHorrible**

Hopefully, we can identify genes, locate where in the brain they operate, and finally understand where the breakdown in the motor-speech plan occurs. Once we have that piece we can develop a treatment approach that targets that specific area/s of the brain and compensates for the mechanism, or potentially mutes the genes. Please have your son participate! It is a great field to be a part of! Thanks for your question!

My wife is in your course in Wayne state presently and works with you I believe, it was awesome to open Reddit today and be able to forward this thread on to her! I hope your study goes well and you and all your future slp's are able to help as many sufferers as possible, good luck!

**Phantomdd87**

Thanks! Great to have community support! Go WSU!

Thank you so much for taking the time to do this AMA. About 3.5 years ago I became brain damaged due to a neurological condition I became ill with. When I began my recovery process I struggled with forming thoughts and speaking them. It was during that time that my husband and I noticed a stutter whenever I became flustered, angry, upset etc. I also stammer during these times.

Is brain damage a normal way to develop a stutter? Why does it come up when I can't control my mood? (Also I had a small stutter when I was very young but my speech therapist determined it was because I would get too excited when I talked. As soon as she taught me to speak slower the stutter went away)

Btw- Im fine now. Just a bit twitchy and stutter every now and then.

**xfitsally**

Hi xfitsally! Your developmental stutter that began as a child never went away completely. It became so mild and rare, you never noticed it for years, but it was there. When your neurological condition began to challenge your regulatory behaviors it reduced your brain’s ability to suppress your stutter, especially when you were taxed with demands such as stress or frustrations. I'm always fascinated by the way these types of mechanisms all are linked together, but is quite common! Thanks for sharing!
Hi, Dr. Kraft! Thanks for doing this AMA.

What is the most interesting pattern of disfluency you have seen?

**Craptacles**

I see everything. Some patterns are more common and predictable than others. I have heard people who stutter on the unstressed endings of words. I have only seen it in one person. It looked like this: teacher-er-er You just have to remember that everyone is an individual, with their own type, severity, and unique stuttering profile. That is why treatment needs to be so individualized. Cool question!

Hi Dr Kraft! I didn't begin stuttering until Middle School and later discovered my grandmother was a stutterer and my grandfather on the other side was until 13. Stuttering not only can impair speech but also thought. When in a conversation, I focus on getting the words out, sometimes more than the words I'm getting out. Is there any research on the impairment of cognition when talking?

**influencedbyyou**

Managing your stutter can take a great deal of cognitive effort. It isn't considered an impairment on its own since each person has different degrees of this covert stuttering severity. I hope you can get your grandparents to participate in this study with you! Send them the link (or help them on your computer :)

Great points about cognition! Thanks for sharing!

Greetings sir!

I have a bit of a tangential question for you.

I'm also a professor working at a similarly ranked R1 institution. I'm curious what your thoughts are on managing careers with such poor access to students and resources.

I've been very successful at grant writing, averaging $1M a year in new funding, but I've been unable to find quality students to staff my grants. In addition, our University has terrible staff. They're lazy and incompetent. As a result I have to do all billing, tuition assessment, etc, or the few students I have end up missing a pay check or getting billed improperly. Worse still sometimes the university just forgets to bill a grant and we don't have the money and my students can't make rent.

In the end I'm left frustrated, I do most of my grant work myself at night from 9pm to 4am, and really get little to nothing from the University environment except stress. Most of my time is spent shielding my students from mistakes from University staff, so they can get their pay checks.

I'm considering leaving for industry because I feel it may be a more effective place to get science done, as I'll have more time for my research.

What are you thoughts on managing a career in science at places like Wayne State? Have your experiences been similar?

**PazuzuLazuli**

I will say that Wayne State University is a fantastic place to work. I love it here. I have very competent support, staff, and students. Good luck with your new job search!

Hi! Thanks for taking the time to do this AMA!
What's the difference between stuttering and stammering?

This is coming from someone (M/29) who has always had fairly difficult time connecting the words in his head and making them come out his mouth. Especially in the right order.

**B_lowedobservations**

Hello! There is no difference between stuttering and stammering. The UK uses the term stammering, and the rest of the English speaking world used the term stuttering. Look into the fluency disorder of Cluttering! See if it matches your symptoms. If it doesn't, then look up Apraxia of speech. Good luck!

Have you considered reaching out to 23 and me? They often plug their ability to conduct GWAS via email and have 1M+ genotypes to go after... Pretty general population too as far as these things go.

**dalaio**

Great idea! I will look into this!

How is stuttering and "speech blocks" related? I grew up with a stutter but slowly grew out of it. However, when tired/stress, I sometimes have trouble starting a sentence off with a certain word, and certain sounds have trouble coming out. This can also happen randomly with a word once, which leads it to becoming a common word I avoid due to feeling like it could happen again.

**crenzz**

Blocking is a type of stutter. Typically, stuttering consists of blocking, repetitions, or prolongations. People sometimes change which type of stutter they produce over time. Try not to avoid words and become fearful of them. Stuttering will happen, and sometimes the mental effort of avoidance can become worse than the stutter. Thanks for your question crenzz!

Wayne State Grad here and reading specialist, I have two students who struggle from stammer, showed them this today and they were very interested. They live in the Metro Detroit area, my question is what to do parental consent and consent from my district though...

**0and18**

Just share the link attached to this thread above with the parents of your students. They can use their phones or computers to fill out the consent paperwork and I can be in contact directly with them! Thanks for checking!

Has there been proposed a biochemical mechanism to explain the link between stuttering and mutations in the Uncovering Enzyme (NAGPA)?

**TagProWreckn**

I believe Dennis Drayna of the NIH is still investigating this.

Hello! Thanks for doing this AMA.

My brother has a stutter, he has a terrible time speaking, and gets hung up on words, especially those
starting with "d" and "c/k's".

I heard him singing once to himself, and noticed he had no stutter at all. From there, anytime he would get hung up on a word I would have him "sing" the word. This was more of a change in pitch, and it seemed to have very consistent results.

Have you had any experience in this?

Thanks!

rainbohemoth

Yes! Stuttering is an amazing disorder. Speaking with an accent, whispering, singing, or talking in unison with someone else makes it disappear for most people. We don't use these ameliorating techniques as therapy techniques because it is equally as unnatural to sing everything you say as to stutter it. If your brother likes to sing when he gets stuck and it helps him, then super! It isn't for everyone, especially as they get older. Thanks for asking!

My girlfriend has a slight stutter sometimes and her son, age 3, has one too. She was saying that children at that age either grow out of it or it sticks around. Is that an accurate statement?

Code3Resources

Your girlfriend is absolutely right. Research shows that 5-6% of children stutter for a short time, but only 1% of adults stutter. At 3 years of age, it is difficult to say whether your girlfriend's son will persist into adulthood or not, particularly without a full case history and clinical evaluation of his fluency. If she has any concerns regarding her son's stutter, she is welcome to contact me directly. They are also both welcome to participate in the study! Hopefully, with their help, we can learn more about the "how" and "why" of stuttering! https://waynestate.az1.qualtrics.com/SE/?SID=SV_0221aHz6j23fGex

Is there any connection between Aspergers and stuttering?

CyFus

Great question! There is no known link between stuttering and Aspergers. However, some people who stutter develop secondary behaviors to escape or avoid a stuttering event. Common examples of escape behaviors are head nodding, eye blinking and eye-contact avoidance, and/or tension of the head and neck. Some of these secondary behaviors may overlap with behaviors that can be seen in autism spectrum disorders (e.g. Aspergers), but they have evolved from very different etiologies. Thanks for your contribution CyFus!

I've been told that I stutter because I'm multilingual (5), is that possible? All the languages were acquired when I was a child.

Wonka_Raskolnikov

No, you don't stutter from being multilingual. You would likely stutter even if you were monolingual. Some people who speak more than one language will stutter more, or less, in one language than in the others. This is thought to be due to the amount of brain effort required, and level of novelty, for one language over the other. Thanks for asking!
I don't stutter often. Probably one or two days a week, but on that day it happens the whole day. I have no idea why, and as far as I can see it doesn't seem to have a specific trigger. Have you seen this before? And why does it happen?

Aldenaees

I hear this often with my adult clients, and see it frequently with children, too. For some people sleep can be a factor. Sometimes, it just seems to happen without a sleepless night. All I can say is, you aren't alone!

Is there any (known or theorized) biological or genetic link between stuttering and selective mutism?

WELLinTHIShouse

None. They stem from two different etiologies. Good question!

I'm in the Detroit area and stutter. How can I participate in the study?

FuriousArhat

Follow this link! https://waynestate.az1.qualtrics.com/jfe/form/SV_0221qHz6j23fGex

My dad's brother speaks with a stutter all the time. My dad, my brother and I (a girl) only stutter when we're upset (angry, frustrated, flustered). Why the difference?

mbm66

Everyone is different. Our individual brain development, personality, and motor abilities (as well as many other factors) all contribute to severity. I have seen many families in my studies who have a wide variety of stutters displayed all within the same family. Please have them sign up for this study!

This is fascinating, I had no idea that stuttering could be heritable. What prompted you to investigate the genetics of it?

spinnetrouble

When you work clinically with people who stutter, they will 80% of the time, tell you they have a relative who also stutters!

Hello Dr. Kraft,

Everyone really appreciates the time you have taken out of your busy schedule to answer some questions and help us understand this condition better than before!
As a child, I had an extremely bad stutter and lasted up until the last year of middle school. All through elementary school I went through “Speech”. My aunt has a worse stutter than me and has lasted all through her life.

At this current state, I stutter only a few times a day but nothing awful. I find when I get nervous or think about something that gets me uneasy, I am more prone to stutter. I have also found that my main issue at this point in time, is saying my name on occasion. Like introducing myself to small room of people gets me nervous that I will stutter my name, while if I had to get up and speak I would be able to start with a preamble and say my name without hesitation.

In your research, have you found many post-stutters have a hard time saying their name? Thank you, for all the great work! :)

deero1245

Saying your name is one of the toughest, and most common, difficulties for people who stutter. You are certainly not alone! Thanks for your support!

Hey there Dr Kraft, A few years back I developed a slight stutter that lasted about 6 months after taking some acid (possibly 2c)

What would be the mechanism that could have caused it, made it last so long?

ekolby4078

I haven't heard of this before. I can't even postulate this one! My only advice is to stay away from acid! :) 

Hello Professor Kraft. I've been stuttering since as long as I can remember. I also have issues where it seems more prevalent in certain situations. At times I can be completely fluent, other times I can stutter badly where I am almost shaking. I have never been to a speech therapist, I was wondering if there were any breathing exercises you could recommend. If I get in a bad block, I feel like I am running out of breath. Also, I have a BA in Math, and am pursuing an MS in Mechanical Engineering. Professionally, do you feel stuttering carries a certain stigma in higher education (Like, are stuttersers looked at differently)? Also, I know that many people who stutter develop it at a younger age. Besides the obvious really bad blocks or secondary behaviors, is there a way to differentiate what are normal disfluencies in early speech, and what would be considered the early onset of stuttering? Thanks!

I divide by zero

Hello, what you describe is very typical for people who stutter. It fluctuates by person, place, day, time, word, mood, ect. Relaxation techniques that involve breath control work for some people, but honestly, you should see a stuttering specialist who can individualize therapy for you. As far a stigma. I think the sky is the limit for you. Our current Vice-President Joe Biden is a person who stutters.. look up famous people who stutter and that should be your answer! Best wishes to your bright future!

As a kid I stuttered. I am also mildly dyslexic. I don't know if they are connected or not. At about 8 or 9 I talked to a family doctor who told me I was thinking too fast and trying to talk as fast as I was thinking. He told me to slow down and pause before speaking to get my thoughts in order first. I did what he suggested and it seemed to help. My stuttering gradually went away. But I still pause to get my thoughts in order before speaking. Another way of putting it is, “Always be sure your mind is in gear before setting your mouth in motion.” That habit has probably led to people considering me smarter.
than I really am. As for the dyslexia, I learned to compensate by always re-reading anything I write, and stopping when reading and going back over things that seemed a little off or didn't make sense on the first read.

**Limonhed**

We don't believe that the two disorders are directly connected. I have worked with several people who have both, like you, so they can co-exist. It sounds like you have managed both quite well, and found strategies that work for you!

My own developmental stutter surely inspired me to learn more about the brain, which doubtless has a lot to do with why I became a neurologist. It lasted from age 9-16 or thereabouts.

My own stutter is 99% gone, has been gone for decades, and in fact I regularly do public speaking, which I never would have believed possible when I was young. (I think stagefright may be impossible for me now!)

Will you be studying people like me, or only people whose stutters are persistent?

**sockalicious**

Hello sockalicious, thank you for sharing your story and for your interest in participating in this study. I can fully appreciate your curiosity regarding stuttering and the complex mechanisms that contribute to the disorder. We would still appreciate your participation in this study, even if you feel you have recovered. Thanks again for your support! [https://wayne.state.az1.qualtrics.com/SE/?SID=SV_0221aH6j23fGex](https://wayne.state.az1.qualtrics.com/SE/?SID=SV_0221aH6j23fGex)