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From Bassoonist to Nobel Laureate: An Interview with Thomas Südhof

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In October of 2013, neuroscientist Thomas Südhof was awarded the Nobel Prize in Physiology or Medicine for his work on explaining the mechanisms of the presynaptic neuron. This research, exploring what happens when the presynaptic mechanism works correctly as well as when it malfunctions, gives us a much deeper view into how the healthy brain relays information and how conditions such as autism and Alzheimer's disrupt that relay process.

Shortly after his prize was announced, *Slipped Disc* blogger Norman Lebrecht posted an excerpt of a 2010 interview (which first appeared in *The Lancet*) in which Dr. Südhof credits his bassoon teacher, **Herbert Tauscher**, with teaching him “that the only way to do something right is to practice and listen and practice and listen, hours, and hours, and hours.” Within days, Südhof became a hero of music performers and educators (and especially bassoonists) worldwide, his picture appearing in countless Facebook feeds next to Lebrecht's splashy headline, “Nobel medicine winner says: I owe it all to my bassoon teacher.” Curious about Dr. Südhof and his musical studies, I recently sent an e-mail to his Stanford University address proposing an interview. To my delight—and hopefully yours as well—he very graciously agreed to share his thoughts on a variety of topics.

Ryan Romine (RR): *In comments you made in The Lancet in 2010 and others recently posted by Norman Lebrecht of Slipped Disc, you credited your bassoon teacher with teaching you valuable skills for your career. Can you expand on those earlier comments about your musical training and its impact on your research skills?*

Thomas Südhof (TS): The qualities I learned from my training in classical music, in particular in bassoon, are multifarious and varied. Let me list a few. First, the value of disciplined study, or repetitive learning, for creativity. You cannot be creative on a bassoon if you don't know it inside out, and you cannot be creative in science if you don't have a deep knowledge of the details. Second, the value of good mentorship. A good teacher challenges and criticizes, but does not chastise or put down a student, no matter what. Third, the role of performance in a profession. As a musician, you practice for thousands of hours to play for a few minutes—but when you play, you have to not only recapitulate the learned material, you have to expand on it and you have to communicate it to the audience. In science, it is basically the same thing—it is in the end a process which also depends on communicating with an audience and accepting and responding to its feedback. Finally, I learned to value traditions as a musician, but at the same time the importance of trying to transcend tradition. The tradition is the basis that allows you to progress, the starting point, but it cannot become a limitation, because then both in music and in science creativity and progress end.

RR: *Taken from the opposite vantage point, what do you feel scientific training has to offer the musician?*

TS: I am not sure whether there is anything scientific training could offer a musician since for me the path was from music to science—except maybe one thing: it is important to believe in what you do, no matter what the majority of people around you think.

RR: How did you first start playing the bassoon?

TS: I used to play violin, but had a bad teacher and did not like it. I liked the bassoon because of its sound, and persuaded my parents to let me learn it when I was twelve years old.

RR: Do you come from a musical family?

TS: No—my parents were physicians. However, my family was very interested in music, dragged me to concerts at a young age, and valued the arts.

RR: How do your children's musical experiences in the US compare with your own childhood musical experiences in Germany?

TS: I think the US offers terrific opportunities for young children to learn classical music. I only wish there were more opportunities [for them] to go to concerts and to perform in concerts.

RR: Do you feel there is a cultural/temporal/geographical/neurological difference in how art music is perceived and valued in the present society in comparison to when you were growing up?

TS: Absolutely—in the US at the present time, classical music is fundamentally a dying art. There are few people who are willing to pay for it and its importance is minuscule compared to that of popular sports. Musicians earn a fraction of what even a mediocre athlete earns. There is no vibrant musical culture at present—everything is geared towards being commercially successful, not towards content. However, I think the same trend is observed in Europe, and we need to accept this trend and look for components in popular culture that are not boring (sometimes quite hard for me).

RR: Would you encourage your children to become musicians, scientists, both, neither?

TS: Only if they have a passion for it—it is a lot easier to have a stable life and to support a family in other professions. Being a musician or a scientist is a sacrifice, and only worth it if you truly enjoy it and consider it a privilege.

RR: Do you believe that art and science serve similar purposes?

TS: Of course—in different ways. They basically transcend the moment, and provide insights into truths, although in different kinds of experiences.

RR: Do you believe the artistic and scientific urge/drive come from the same place?

TS: Yes and no. I think an artist cannot operate with explicit planned actions, but needs to develop sub-conscious actions, whereas a scientist is the opposite. However, both are driven by the same appreciation of a true, fashion-independent content.

RR: The American education system has in the past few years invested heavily in STEM (Science, Technology, Engineering, Mathematics) subjects, which place a significant emphasis on your career field. Yet, your earlier published statements place significant value on arts training. Do you see any way to integrate these two seemingly disparate ideals?

TS: I personally think that training in the arts prepares a growing child just as well for a scientific or technical career as [does] training in STEM subjects, if not better, because the arts train a person in discipline, independent action, thinking, and in the need for attention to detail without becoming a prisoner of that detail. I absolutely don't think there is a need for earlier math training—there is only a need for training the mind so it becomes fertile for future learning.

RR: *You have also recently commented on the research community being limited by the push for work that will be more immediately useful for commercial purposes. Do you sense any relation between this and recent trends in American education that place less emphasis on liberal education and more emphasis on marketability?*

TS: Absolutely—in my personal opinion this is a big mistake for the reasons I outlined above. Inventions and advances can't be forced, creativity is not just a consequence of specialization—quite the opposite.

RR: *Though you are clearly deeply interested in pure scientific inquiry, you must also be well aware that your work will inevitably be used for commercial purposes. Someone down the line stands to make millions by building on your research. Do you feel that this is fair/unfair in any way?*

TS: I think this is perfectly fair. I am doing science for others to use—if that makes somebody else rich, even better!

RR: *Your wife, Lu Chen, is also a neuroscientist. How does your relationship affect your work?*

TS: It is a wonderful enrichment of my life to be able to talk to my wife about science.

RR: *In addition to your work with the fundamentals of presynaptic function, you also have an interest in how this ties in with certain neurological disorders such as Alzheimer's and autism. Is this interest spurred by personal experience or is it simply a natural extension of your work?*

TS: It is a natural extension of my work, an extension that I welcome because I was originally trained in medicine, and feel that if eventually something practically useful comes out of my work this would be terrific.

RR: *Do you still own/play a bassoon?*

TS: I still own my bassoon—upstairs in a cupboard—but I don't play it any more....

RR: *Who is the maker?*

TS: Hüller, a former East-German company.

RR: *Can you tell our readers a bit about your teacher, Herbert Tauscher?*

TS: My bassoon teacher used to be the solo bassoonist at the opera of Hanover [Germany]. He was also a bassoon professor at the local conservatory. He loved music, and he loved playing in an orchestra—he knew the entire repertoire (the orchestras in Germany perform every night, so they have a lot of experience), and he deeply appreciated the richness of different composers' works, from baroque to contemporary music. He was a true artist and at the same time a musical craftsman who knew and valued his trade.

RR: *What were your lessons with Mr. Tauscher like?*

TS: We would meet once a week, either in the conservatory or in his home, and first play etudes and then pieces from the literature. He would tell me what to learn for the next lesson, and I would try to do so—not always successfully...

RR: *Did you ever consider music as a potential career?*

TS: Of course—but I felt that I was not talented enough, which I think is true.

RR: *Do you have any favorite composers or performers (classical or otherwise)?*

TS: Not really—I simply love almost all classical music, from Bach to Bartok, and everything in between. If anything, I would say I am most partial to operas because I am inspired by the idea of the *Gesamtkunstwerk*, of fusing the human word with the sound of a melody—but I also love for example the Bach solo sonatas or symphonic music. Of the composers who are not as well known in the US, I particularly like Bruckner and Alban Berg, but I would not prefer them overall to Brahms or Strauss, it is just that they are not played very often....

RR: *Thank you so much, Dr. Südhof, for your time and your thoughts. Bassoonists (and musicians in general) worldwide are surely proud to count you as one of their own.*

TS: I wish I could still be a bassoonist—it was a lot harder than being a scientist.