

[SLIDE – GO TO BLANK ]

Musicianship could be broadly defined as the extent to which an individual possesses traits associated with being musical.

While that might seem like a loose and possibly tautological definition, the concept of musicianship is hard to define. Often the title of musician often refers to how adept someone is in a performative context. As seen here [ SLIDE – GOOGLE IMAGES ] , searching the word ‘musicians’ on Google last week brought forth a collection of images demonstrating this. We see groups of individuals facing forward, ready to create some sort of musical experience for their audiences; the kinds of images your average person might first think of when they think of “musicians”. *Often* people who engage more in musical activities and whose livelihood depend on it more are pronounced as “more of a musician” or are maybe more likely to *get* the title than those who do not. Whether these people differ in degree of talent or of category, this language still implies some sort of implicit logical comparison.

[SLIDE – ZOOM IN ON METAL BAND ]

Is the drummer in the band here somewhat less musical than the guitar player since they are not actively manipulating pitch? Or said another way, in terms of a null hypothesis – is each member of this band equally likely to be the same level of musical?

[SLIDE – DEFAULT]

Speaking to a room of music academics, most people here would be quick to point out that forming questions like these are somewhat uninformed and that the earlier idea of musicianship I put forward is by no means a cultural universal. This notion of performative musical culture is relatively new in Western culture and that given the algorithmic biases in Google’s search engines, a random search on my computer with the term “musicians” most defiantly should not serve as a random, representative sample of the many ways one could

be a musician. As many of us may have learned in our first ethnomusicology class, many cultures do not share the same concept of “musician-as-profession” that some Westerners do.

[SLIDE TO JOHN BLACKING]

The ideas of sound-as-art and ideas of not divorcing the aural element of music from the participatory or dance elements hopefully has lead most with Bachelor’s of Musics to a more nuanced view of musicality. Hopefully these types of discussions have given most people the mental tools needed to see how illogical it is to draw some sort of arbitrary line within any musical culture and assert that some individuals are musicians and others are not based on culturally imposed values.

[SLIDE – DEFAULT]

In many ways the conversation could end here and the idea of “Who gets to count as a musician?” has been answered – and that answer is: it depends. It depends on the culture and the context, it depends who is asking the question, and for what reasons. For most intents and purposes, it is a poorly formed question. But I still have 15 minutes devoted to trying to answer it. The problem is that there *is* one area of research that is dependent on the ability to measure musicianship in a “concrete” way. That is music psychology. From a scientific standpoint, the extent to which an individual possess traits associated with being musical needs to be operationalized in order for questions about musicality to be moved from a comparative discussion to a place where questions are now demarcated, and thus falsifiable. Only once this operation alization has been made and musicianship has been clearly defined *a priori* can researchers begin to investigate claims of how musicality or musicianship is related to other human behaviors such as its relation to memory, social identity, social status, and even intelligence.

[Slide to Measuring Musicianship Header]

Attempting to measure musicianship is by no means a recent endeavor. Almost one century ago Carl Seashore first published his Tests of Musical Ability in 1919, thus marking the first attempt to use psychometric tools to asses musicianship and wrote about psychometrics and music even before that.

[ SLIDE to SEASHORE]

On the slide here I have the opening of his 1915 book “The Measurement of Musical Talent” where he notes in the beginning of his text at the second paragraph:

[SLIDE TEXT]

“Music talent, like all other talent, is a gift of nature-- Inherited, not acquired; in so far as a musician has natural ability in music, [humorously] he has to be born with it. Perhaps natural ability of a high order is not so very rare, for modern psychology has demonstrated that a surprisingly small portion of our talents are allowed to develop and to come to fruition, and thus has given great reinforcement to the dictum that many men “die with all their music in them”.

[ SLIDE TO ONION ]

When read aloud today as a serious psychological science, the passage resembles one of my favorite Onion articles that scratches at the same sentiment-- namely that talent, especially musical talent is thought of as some sort of latent ability that you either have or you do not.

Moving back to Seashore in that same paragraph he later goes on to say

[SLIDE TO SEASHORE]

“From the point of view of measurement, the latent power is as tangible as the developed, and is often of greater interest. The measurement of musical capacity, therefore, concerns itself chiefly with inborn psychophysical and mental capacities as distinguished from skill acquired in training.”

It is important to note that in both of these examples, and the common notions of musicality mentioned earlier depend on a mental model where individuals have some sort of latent trait, in this case musicianship, that is assumed to be within the individual. If this then is our mental model of musicality, how do we begin to better understand it?

Returning again to Seashore, his logic was that a person who was *more* musical should be able to do better on than *less* musical people on musical tasks. The test that Seashore developed consisted of six different

submodules measuring perceptual abilities ranging from psychoacoustics to memory for melody. Inherent in its design were many of the performative, Western assumptions mentioned before, namely that one's listening and perceptual ability reflected the same concept AND could be used as a proxy for that individual's future in music.

[SLIDE TO SCIENTIFIC AMERICAN]

Following up on Seashore's initial publication, the magazine Scientific American even ran an article titled "Are you a Musician?" about the test in 1922. Here is a clipping from that article where he can be seen sitting next to one of the contraptions he used to assess how musical you were by doing the "musical" analogue to a color differentiation task that might predict likelihood for painting aptitude. Do the pitches go up or down?:

[SLIDE TO LP, PLAY]

They get a bit harder than that, so don't get too excited if you got them all. According to the 1923 article, after taking a test like this Seashore was supposedly able to correctly identify specific musical talent.

[SLIDE TO IOWA]

The article notes that (starting here, point)

"One boy, whose father wished him to be trained in business in a small Iowa town, was obsessed with the desire to become a violinist. His father agreed to let the decision rest with Seashore as to which course was to be followed. The boy, now twenty years old, is giving a series of violin recitals throughout the country and is being sent next year to Europe for further training. He has been hailed by critics as the "Iowa Kreisler." He came within an inch of being just another Iowa hardware merchant."

[ SLIDE DEFAULT ]

Since then the field of music and psychometrics has haphazardly lurched forward, as most scientific research does. The test was used here and there and praised by some as "outstandingly the most important battery of test in the field of music." according to James Mursell who was quoted in

This article from 1944

[SYNTHETIC SLIDE]

**\*\*While there may have been other articles I could have chosen to share, this one was too good not to use.\*\***

The article concludes that:

[SYNTHETIC II]

“A marihuana like synthetic appears to improve an individual’s subjective impression of his own musical ability, rather than the ability per se as measured by the Seashore test.”

[SLIDE DEFAULT]

Importantly here we see that there is some sort of attempt to operationalize musicality and then to test it against some sort of behavioral measure. This tradition of psychometrics and music continued through the 20 and 21st century and many other researchers have attempted this refine the task of measuring musicianship. Brief histories of psychometrics and music can be found in the litany of tests that have arisen since Seashore’s. Since then there have been the

[ CLICK ON EVERY NAME ]

Musical Ear Test, the Profile of Music Perception Skills or the PROMS, the Ollen Musical Sophistication Index, the Bentley Test of Musical Ability, Gordon’s Advanced Measures of Musical Audiation, the Wing Standardized Tests of Musical Intelligence, the Goldsmiths Musical Sophistication Index or Gold-MSI, as well as the MUSEBAQ to name a few. It is important to note that each of these tests has taken a different approach to attempting to measure musicianship or in some cases musical sophistication, each with their own intentions in mind .

For example, the PROMS is a perceptual test music like the Musical Ear Test or Seashore’s that uses objective measures of ability based on memory tasks, the Ollen Musical Sophistication Index uses self report which again gives some sort of quantitative output that is meant to be used a proxy for musicality, but lacks any sort of perceptual objective data and the Gold-MSI uses both self-report and objective tests in order to give the individual a multitude of scores relating the multitude of aspects the tool purports to measure. With each of

these tools, the output is a continuous variable implying that each trait measured is conceptualized at the level of measurement as being on a continuum rather than a dichotomous variable as is often reflected in the colloquial language used to talk about musicianship.

[SLIDE DEFAULT]

Despite this variety and granularity of measurement, researchers often revert back to the colloquial conception of musicianship and split individuals into two groups based on some sort of arbitrary cutoff. The most recent and possibly clearest example of this is the recent meta-analysis looking at musicians and memory published by Talamini and colleagues in 2017.

[TALAMINI SLIDE] PAUSE

This study [SLIDE] used the amount of years [SLIDE] that an individual engaged in University level music education at the undergraduate level as the cutoff to decide who qualified as a musician and who did not.

Generally speaking they claimed that musicians outperformed their non-musician counterparts on all measures of memory, implying musical training might have something to do with this.

Additionally near the end of their paper they noted that

[SLIDE END TALAMINI QUOTE]

there is [SLIDE] no standard in the music psychology community as how to report musical training and that other factors like general intelligence [SLIDE], socioeconomic income, and selection bias will play a huge role in how these numbers fall. Additionally research like this might be conflating the direction of causality and may actually be reflecting the fact that smarter people tend to do music, a finding with a fair amount of support from a recent line of papers from the lab of Glenn Schellenberg most recently Swaminathan, 2017

[SLIDE SWAMNINATHAN]

a paper that was published just a few weeks after the Talamini et. Al paper.

[SLIDE DEFAULT]

While all of these studies used in conjunction with one another seem to paint some sort of picture that musicianship is often associated with higher cognitive ability, the underlying assumption in a lot of this work is that musicianship itself is driving the phenomena. I argue that this logic is flawed due to the fact that musicianship (or musical training loosely defined here) is both a mathematical and cultural construct that does not even make sense to use to describe what is *causing* a person to perform better at the tasks that these tests measure. This is important to talk about since how we define and model “musicianship” or has a huge impact on the conclusions of the studies that are run in music psychology.

Going deeper into this problem and returning to the idea that it is musicianship that we are measuring and musicianship that is presumably driving some of these effects, would it then make sense to talk about musicianship as the driving force behind these behaviors?

[SLIDE PROCESS OVERLAP THEORY]

Borrowing logic from a recent article in the field of cognitive psychology by Kristof Kovacs and Andrew Conway, would it really make sense to say something along the lines of “Sarah used her musicianship in order to complete the musical memory task”. Musicianship in this case is not an internal resource that Sarah would be drawing from like Seashore may have thought, but rather a collection of separate, but related abilities used to complete a very specific task related to a very small subset of activities in the entire universe that would comprise all possible musical abilities.

It is much clearer to think about modeling this type of activities as a set of overlapping processes (Side note: they call their idea Process Overlap Theory). Kovacs and Conway make their point using the example of *g*, a hypothetical construct meant to represent general intelligence and explain the positive manifold in intelligence research.

[Positive Manifold and *g* SLIDE]

I'm going to take a side step here and talk about theories from intelligence research keeping in mind the mental model used to talk about intelligence will be directly lifted and applied to problems I see in music psychology. By understanding the problems with  $g$ , we can better understand the problems with measuring musicality.

With that in mind, let's proceed.

This idea of the positive manifold is key to understanding the argument. If you are unfamiliar with the term, the positive manifold is the idea that if an individual does well on one mental test, for example a task that requires the ability to mentally rotate an object

[SLIDE MENTAL ROTATION]

, then chances are that the same individual would also do well on a task of general fluid intelligence, general crystallized intelligence, as well as working memory capacity.

[SLIDE Hierarchical Model of Cognitive]

If in an experiment a participant had taken all of these tests represented by the square boxes [point], their scores would be subjected to the statistical technique of factor analysis by the analyst in order to flush out any sort of statistical noise and be left with the individual's  $g$  score. Borrowing again the example initially used by Kovacs and Conway, they note that it would not make sense to say using **THIS** [POINT]

[POT Diagram SLIDE]

model "John used his general intelligence to complete the mental rotation task", but rather "John recruited mental resources required to create an image in his head then rotate it".

[DEFAULT SLIDE]

Even without knowing much about cognitive psychology it hopefully makes sense that this model of intelligence and  $g$  is not that sustainable. Additionally the authors argue that the idea of  $g$  is fallible in that studies examining double dissociations at the behavioral and neurological level do not support the idea of  $g$  as any sort of ontological, causal reality and note that researchers should not confuse the statistically constructed  $g$  as any



sort of reality that explains human behavior in a satisfactory way. As I stated before, the form of their entire argument can almost be directly lifted with exchanging the idea of *g* with musicianship in order to make the same points about the flaws with attempting to measure musicianship.

Take for example the model used here to talk about Musical Sophistication from the Goldsmiths Musical Sophistication Index which measures *Not only* Musical Sophistication at the highest level, but also accounts for variance in five different sub scales that are distinct to the general level. Does this look familiar?

[GMSI FIGURE 1 SLIDE]

If you thought to yourself, why yes it does! You're right! The math used in both cases is called latent variable modeling and supposes that some sort of trait that we believe to exist like musicality, intelligence, depression, or anxiety can be measured through use of certain behavioral indicators that are indicative to the presence of a latent variable. Remember that while these are not apples to apples comparisons, the math used to model them depends on similar data reductive techniques. Understanding these problems with measuring musicianship finally leads to my claims about musicality as: namely that it does not exist.

THESIS STATEMENT, SAY IT SLOWLY

[THESIS SLIDE]

Musicianship, just like intelligence, is not ontologically real. It is a statistical abstraction, like the weather or the economy, that helps us talk about highly complex underlying processes.

With respect to music, the separate underlying processes are related in that they enable our musical activities. They are not unified, however, as a monolithic internal resource.

[SLIDE DEFAULT] – BREAK

This definition of music follows some of the initial theoretical claims which in turn *inspired* tools like the Goldsmiths Musical Sophistication Index. Back in 2012 Dan Levitin

[SLIDE LEVITIN]

argued for a more polymorphic view of musicianship that divorced perceptual and performative abilities. This line of thought even extends further back to claims made by Isabelle Peretz and Max Coltheart who in 2003

[SLIDE PERETZ]

argued for this at the neurological level in their heavily cited paper.

[SLIDE DEFAULT]

My view of musicianship steps beyond this and asserts that any of the latent traits associated with musicianship or musical sophistication should be viewed as mathematical artefact used to model language and that in order for music psychology to make more interpretable progress as a research discipline modeling needs to be more reflective of the cognitive abilities used to complete each related, yet not unified tasks.

This view is in opposition to some of the music and psychology literature in that psychometric tools like the Gold-MSI and MUSBAQ because I assert that the composite numbers that are derived from these tests do not reflect any sort of ontological truth.

This is not to say that these tools are not useful!

The positive relationships between musicianship and the mass of an individual's corpus callosum is a helpful fact to have established. What I am arguing for is that the causal element driving this relationship if thought of as being "musicianship" as operationalized as above to be driving this effect would be poorly understood.

[ Positive Returns Slide ]

While the prior assertions might sound a bit extreme, adopting this view of musicianship has a fair amount of positive returns. The first and most apparent would be that future studies in music psychology would be able to better model the causal mechanisms that lead to variation at the individual level. By not having to pass through a statistical artefact, musical sophistication, less noise would be introduced into models of cause and effect.

Secondly, if this view of musicianship were adopted in educational contexts, situations where an individual was either self (or other) diagnosed as “not being musical enough” the root of the problem would not be understood as being a lack of musicality, but rather a lack some other ability be it cognitive or experiential. This notion of related, yet not unified musicality would then also be able to predict that specific factors outside of anything traditionally thought of as relating to musicality could be used to better predict performance on a musical task.

Adopting this view of musicality might also then help better frame other research.

[SLIDE HANSEN PEARCE]

Work by Hansen, Vuust, and Pearce in 2017 demonstrated that individuals with more jazz backgrounds would be better at predicting melodic expectations in their familiar jazz idiom than those with classical backgrounds. This would be better explained by listening exposure rather than just a composite score used as a proxy for jazz expertise.

[SLIDE BAKER]

Additionally some of my own work when reinterpreted gives credence to this line of thought. This study claimed that a latent variable of “Wagnerism” was able to predict how well someone did at a memory task above and beyond musicianship as measured by the Gold-MSI’s musical training sub scale . The important point to this is the implication that musical ability or musicianship should not then qualify as a prerequisite in order to “get” more esoteric art music. It is just a matter of putting in the time to be able to parse the auditory scene with the appropriate background information (in this case, have you heard the leitmotifs before?).

[SLIDE DEFAULT]

Thinking more critically about musicianship as a parallel for intelligence or *g* and the construction of such tools that use self-report like the Gold-MSI, would other phenomena in intelligence research manifest themselves since the mental models are the same? Take for example the Flynn effect, the idea that with each generation individuals are growing increasingly more intelligence as a collective.

[SLIDE FLYNN]

As a thought experiment, would it have meant to go back and administer one of these psychometric tests a century ago at the same time when Charles Spearman was administering his first tests of intelligence? Take example surveying someone with items from the Gold-MSI relating to musical **engagement, especially those dealing with tracking music on the internet or listening actively to music via some sort of device! Individuals would clearly score lower on those items and this would lead to scoring lower as a whole on their musical sophistication score.** Would this be equivalent to a musical Flynn effect? Or in the perceptual tests, if the ability to remember melodies is largely dependent on the degree of exposure to patterns in a culture's melody, via the mechanism of statistical learning, would the types of melodies as well as the degree of music an individual was exposed to on a daily routine diminish an individual's ability to score highly on a melodic memory test? Clearly if the answer is yes to either these hypothetical claims of self-report or the objective test, I believe it only bolsters the argument that musicianship is better explained by other processes and that musicianship is indeed just a mathematical artifact used to mirror language used to discuss a collective behavior.

I hope in this paper that I have persuaded you to join me in dispelling the myth of musicality and move towards thinking about music perception and appreciation as a collection of related, though not unified processes.

Points

don't stream youtube video (keepvid)

incorporate george box / romanticism ideas