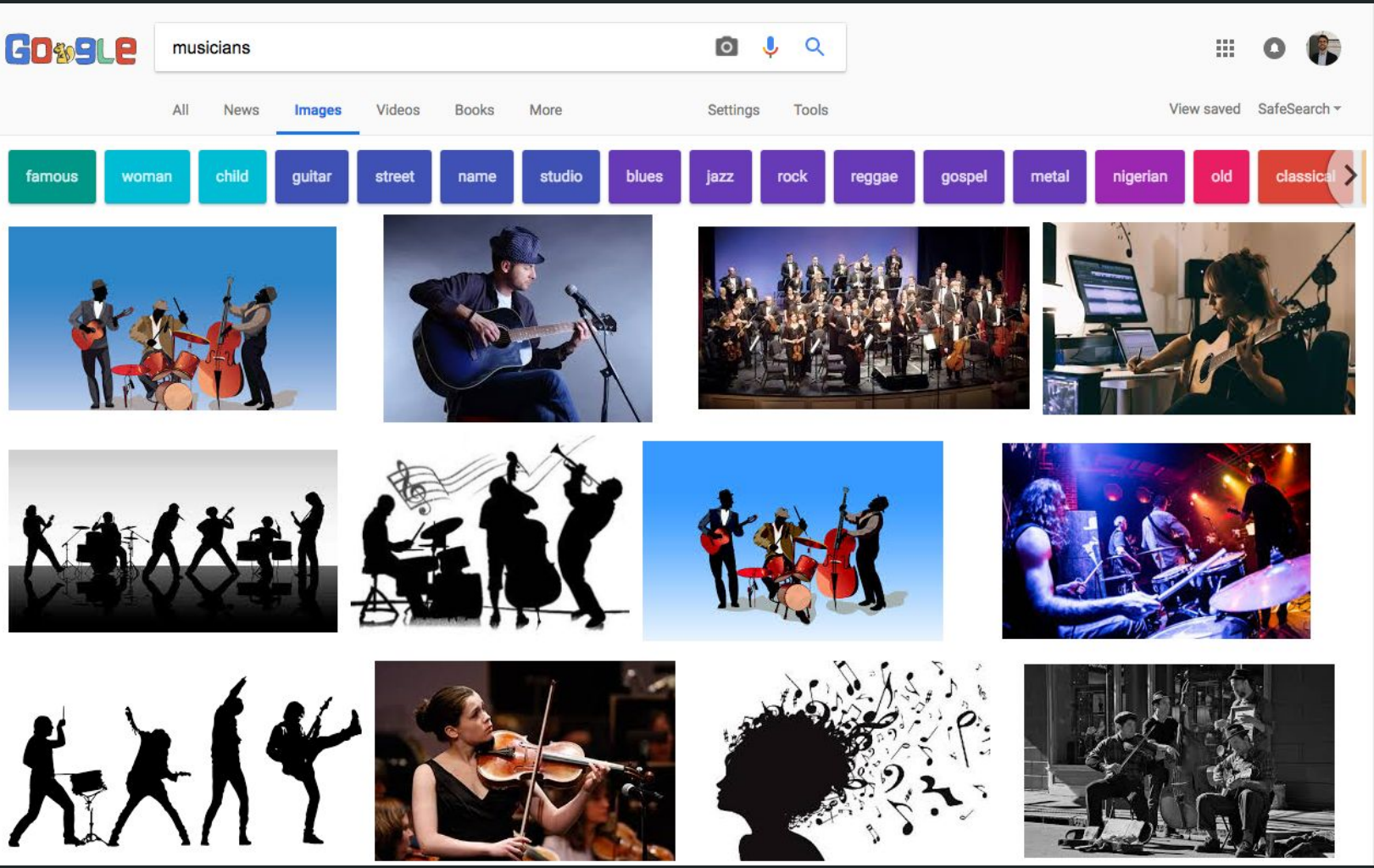
Who counts as a Musician?

David John Baker, Louisiana State University

@DavidJohnBaker / @MCCLatLSU
#musiCola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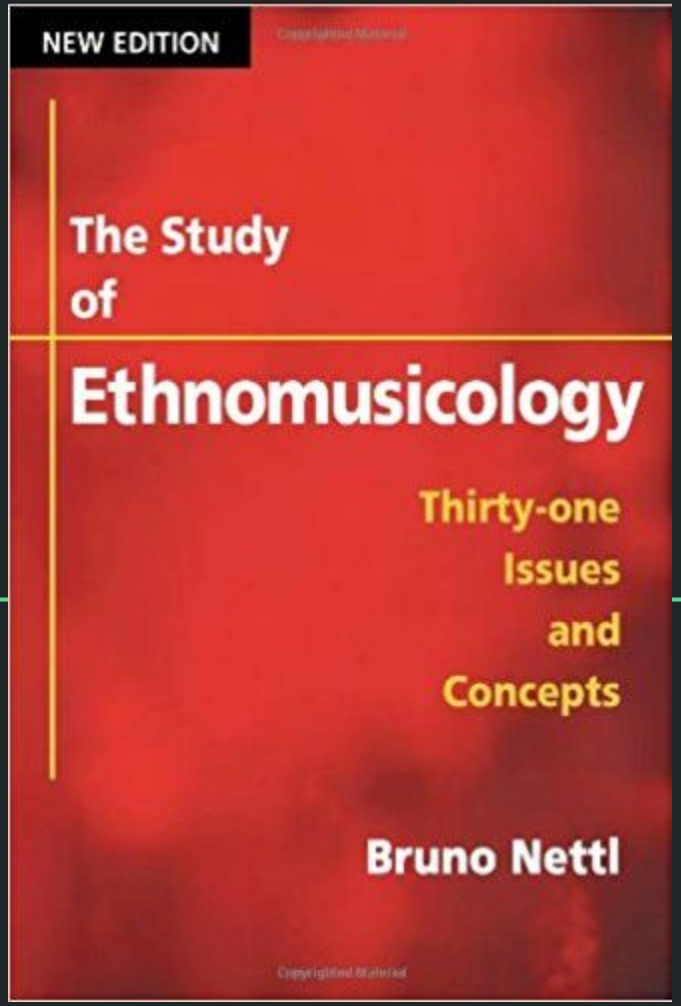
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Measuring Musicianship

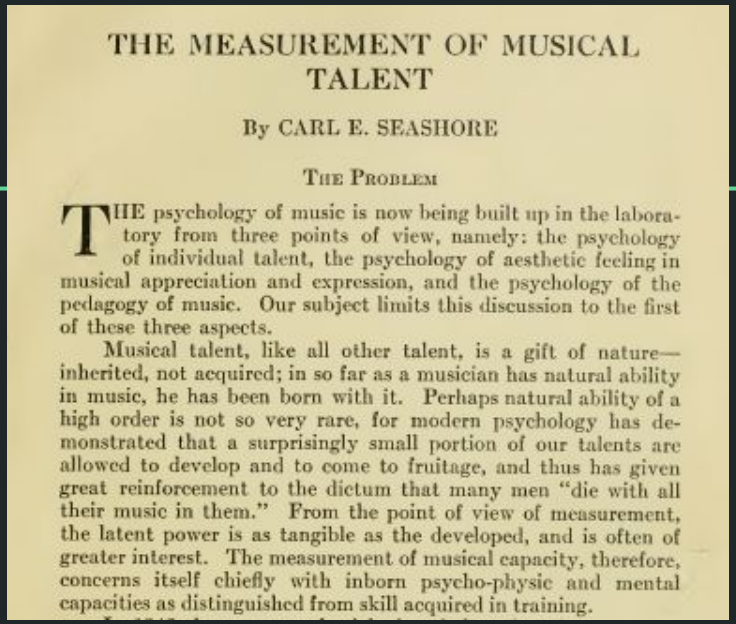
THE MEASUREMENT OF MUSICAL TALENT

By CARL E. SEASHORE

The Problem

THE psychology of music is now being built up in the laboratory from three points of view, namely: the psychology of individual talent, the psychology of aesthetic feeling in musical appreciation and expression, and the psychology of the pedagogy of music. Our subject limits this discussion to the first of these three aspects.

Musical talent, like all other talent, is a gift of nature—inherited, not acquired; in so far as a musician has natural ability in music, he has been 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 fruitage, and thus has given great reinforcement to the dictum that many men "die with all their music in them." 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 psycho-physic and mental capacities as distinguished from skill acquired in training.



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NEWS

97-Year-Old Dies Unaware Of Being Violin Prodigy

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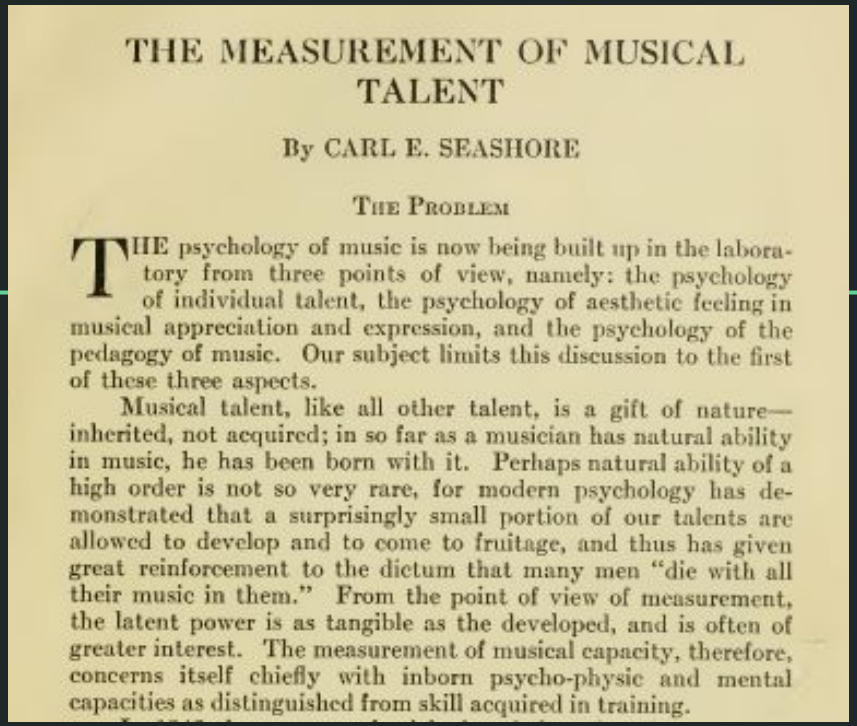
Hollander, and the instrument, inset, that she could have mastered with uncommon grace.



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Are You a Musician?

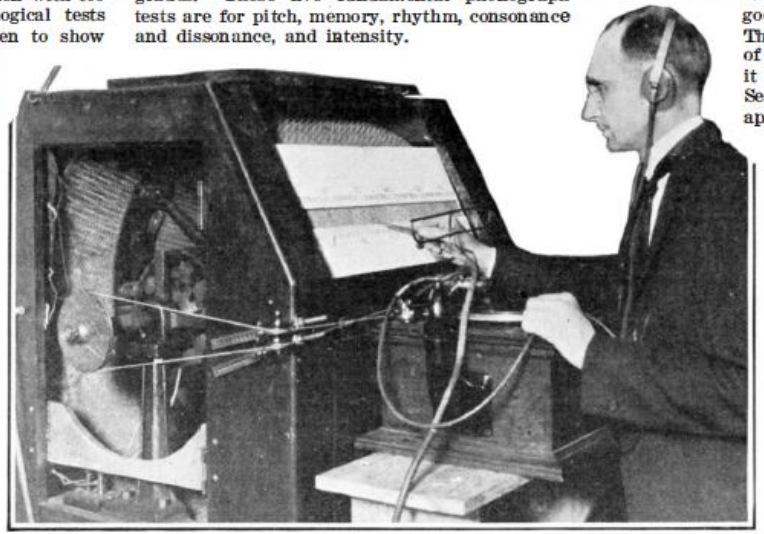
Professor Seashore's Specific Psychological Tests for Specific Musical Abilities

By Harold Cary

WHILE the sciences of physics and chemistry have become fine arts in which accurate measurements are not only possible but required, the attempts to measure the various capacities of the human mind have doddered along so far behind and remained so inaccurate that they have never been taken with too much seriousness. The best that psychological tests have been able to do in the past has been to show indications and determine rough averages. The famous army mental tests, which have been described in this magazine, were good, sound experiments which laid the groundwork for years of work by the mental experts, but even the most enthusiastic psychologists claimed no more for them than that they were rough indications.

Out of the jungle of ignorance of ways and means for precise determinations of mental abilities great things are to come in the next few years. How much we can expect is shown by the excellent work done by Professor Carl Emil Seashore. Most psychologists are agreed that he has done more and gone further to establish precisely certain particular abilities of the human mind than has any other student. His work in measuring musical talent is well-nigh flawless in so far as it goes—and he has gone much further than the layman can have dreamed possible as yet. He does not work with averages but with particular individuals. He is able to test any given subject and to say definitely how much musical talent that person has

The simplest tests which Seashore has devised are now being used in hundreds of educational institutions to rate the capacities of children. For instance, in Des Moines, Iowa, five tests, which have been incorporated into a set of phonograph records, are given to all children in the public schools in the fifth and sixth grades. These five fundamental phonograph tests are for pitch, memory, rhythm, consonance and dissonance, and intensity.



The tonoscope for analyzing the pitch of the tones on a disk phonograph record

The record for pitch is placed upon the phonograph and played through. The sounds are in pairs and the subject is to record on a ruled sheet whether the second sound is higher or lower than the first. The phonograph record is played through and the subjects make their notations. At first the differences between pairs is marked—almost a half tone. As the record goes on they become more and more difficult. The reverse side takes up the test at the point of least difference and becomes easier until it is finished. At the least difference Professor Seashore makes the two tones 1/108 of a tone apart.

The man or woman or child who can make a perfect score in this test has an abnormally fine sense of pitch, yet it does not mean that he has great capacities as a musician. It might mean merely that he would make an excellent piano tuner or adjuster of phonograph motors. The person who makes an exceedingly bad test is not out of it yet either. He probably could never be a composer; but he might be a pianist, for the notes of the piano are fixed.

The test of time is similar to the test for pitch in method. Three clicks made with cocoanuts are recorded, to make each individual test. The subject is to state or write down whether the interval between the second two clicks is shorter or longer than the interval between the first two. This is not a complete test of the sense of rhythm in that you might have a perfect score on this record and still not possess other qualifications necessary to rhythmic ac-


HUMBER COLLEGE
MUSIC DEPARTMENT
SEASHORE MEASURES
OF MUSICAL TALENTS

As Professor Seashore says: "The gift of music is inborn, and inborn in specific types which can be detected early in life, before time for beginning serious musical education."

Specific proof is presented of these facts. Some of Professor Seashore's "discoveries" have been endowed by wealthy persons. They already give promise of becoming brilliant, nationally-known musicians. 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.

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THE EFFECT OF A SYNTHETIC MARIHUANA-LIKE COMPOUND ON MUSICAL TALENT AS MEASURED BY THE SEASHORE TEST

By C. KNIGHT ALDRICH, *Assistant Surgeon, United States Public Health Service*

Musicians, particularly members of dance orchestras, are reputed to use marihuana for the purpose of enhancing their musical ability. Piel (*1*), in Life Magazine, reports that in the state of marihuana intoxication "the swing musician ascends to new peaks of virtuosity." Medical writers, however, are inclined to question this belief, and Walton (*2*) states that "there is very little probability that an individual's performance is in any degree improved over that of his best capabilities. As judged by objectively critical means, the standards of performance are no doubt lowered." In an endeavor to discover the cause of the common misapprehension, he says: "There is an increased sensitivity to sound and a keener appreciation of rhythm and timing," but he feels that "these phenomena, as judged by objective criteria, probably do not exist except during the early phases of the drug's effects." He suggests that the release of inhibitions by marihuana may result in bringing latent talents to the surface or in evoking a more intense emotional performance. He also recognizes, with Bromberg (*3*) and others, that a subject's evaluation of his own performance is enhanced.

SUMMARY OF RESULTS

No improvement was observed in the musical capability, as tested by the Seashore measures of musical talents, of 12 former users of marihuana after ingestion of satisfying amounts of pyra-hexyl compound, a synthetic, marihuana-like substance.

Although 9 out of 12 subjects achieved poorer scores after using the drug than on the previous trial, 8 out of 12 expressed the opinion that their scores had improved, and none recognized a loss in efficiency.

CONCLUSION

Pyra-hexyl compound, 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.

"...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."

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The Musical Ear Test, a new reliable test for measuring musical competence

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This paper reports results from three experiments using the Musical Ear Test (MET), a new test designed for measuring musical abilities in both musicians and non-musicians in an objective way with a relatively short duration (<20 min.). In the first experiment we show how the MET is capable of clearly distinguishing between a group of professional musicians and a group of non-musicians. In the second experiment we demonstrate that results from the MET are strongly correlated with measures of musical expertise obtained using an imitation test. In the third experiment we show that the MET also clearly distinguishes groups of non-musicians, amateurs and professional musicians. The test is found to have a large internal consistency (Cronbach alpha: 0.87). We further show a correlation with amount of practice within the group of professionals as well as a correlation with a forward digit span test.

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Lily N. C. Law, Marcel Zentner

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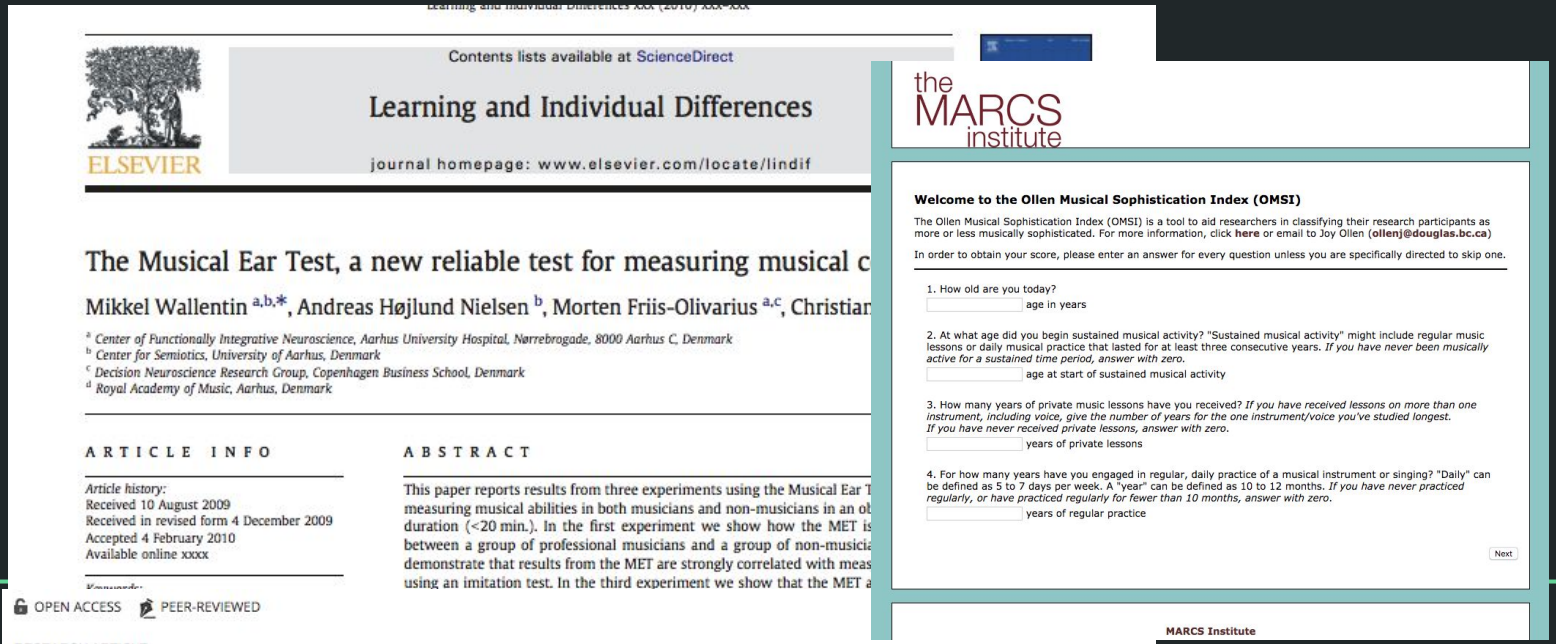

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Welcome to the Ollen Musical Sophistication Index (OMSI)

The Ollen Musical Sophistication Index (OMSI) is a tool to aid researchers in classifying their research participants as more or less musically sophisticated. For more information, click **here** or email to Joy Ollen (**ollenj@douglas.bc.ca**)

In order to obtain your score, please enter an answer for every question unless you are specifically directed to skip one.

1. How old are you today?
   _____ age in years

2. At what age did you begin sustained musical activity? "Sustained musical activity" might include regular music lessons or daily musical practice that lasted for at least three consecutive years. *If you have never been musically active for a sustained time period, answer with zero.*
   _____ age at start of sustained musical activity

3. How many years of private music lessons have you received? *If you have received lessons on more than one instrument, including voice, give the number of years for the one instrument/voice you've studied longest. If you have never received private lessons, answer with zero.*
   _____ years of private lessons

4. For how many years have you engaged in regular, daily practice of a musical instrument or singing? "Daily" can be defined as 5 to 7 days per week. A "year" can be defined as 10 to 12 months. *If you have never practiced regularly, or have practiced regularly for fewer than 10 months, answer with zero.*
   _____ years of regular practice

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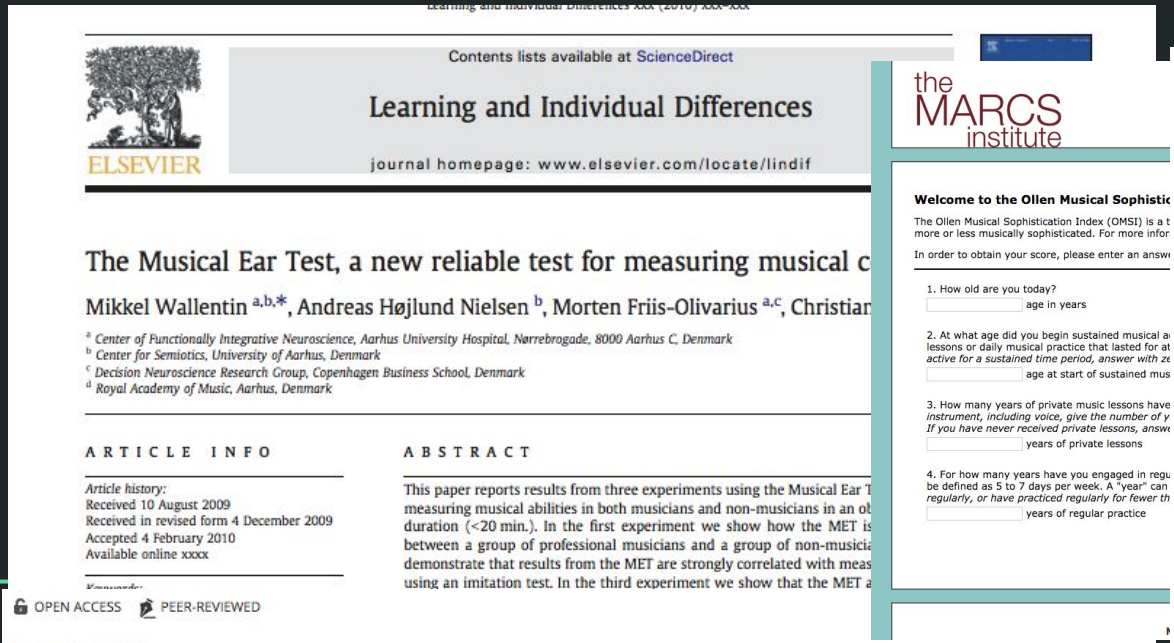

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Measurement and Development of Musical Abilities

Arnold Bentley

Some Research Interests and Findings

My research interests in music education arose from such questions as: Why are some children even as late as 11 years of age still monotones (an inaccurate euphemism for those who cannot sing in tune with others or with an accompanying instrument)? Why are some children obviously more musical than others from comparable home and school environments, and having had similar opportunities and tuition?

The search for answers led me to take more interest in children younger than those I had myself been teaching (11 years of age and upwards), to observe, as far as possible, the natural, untutored development of very young children in terms of music; to consider what are the elemental, basic factors of music itself and to relate these to the observed natural development of children; in the light of this, to establish what are the minimum basic abilities essential for any progress in music practice, and to attempt to measure these abilities by means of group tests.

Answers to questions beginning with *why* are elusive; but in the process of investigation a little more information has been obtained as to *how* children differ in the musical abilities measured, and as to *how* monotones differ from normal-singing children in terms of such measurable musical abilities. Furthermore, an additional apparent phenomenon in the field of pitch discrimination has been revealed.

Measures of Musical Abilities

One result of my investigations was the creation of a new short battery of tests to measure musical abilities in young children (1). A description of the battery, a statement of the rationale on which it was based, and the results obtained, have been published (2). For this paper a very brief account must suffice. The battery consists of four tests:

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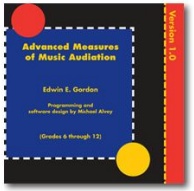
Advanced Measures of Music Audiation (AMMA) CD-ROM

(Grades 7 to Adult) Version 1.0

Edwin E. Gordon



The Advanced Measures of Music Audiation (AMMA) is a valid music aptitude test for college students (both music majors and nonmajors), high school students and junior high students. The entrie test takes less than 20 minutes to complete and yields tonal, rhythm and composite scores.

AMMA is crucial in helping music teachers adapt music instruction to the individual needs of their students. Students do not need to be able to read music or have prior music instruction to take AMMA.

The AMMA CD-ROM is self-scoring and is intended for use on a single computer. A five pack version to be run on up to five computers is available (G-3372CDROMB) at a 20% discount. A Site License may be purchased (G-3372CDROMS) which gives you 10 copies and may be loaded on an unlimited number of computers.

Edwin E. Gordon is Research Professor at the University of South Carolina and is the world's leading researcher in the music aptitude field.

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Some Research Interests and Findings

MY RESEARCH INTERESTS in music education

Tests and measurements in music. Psychological tests in all fields had their inception at the time of World War I. The history of the development of tests of musical capacities and abilities has paralleled that of psychological tests. Tests in music have been devised to measure efficiency of teaching, general musical knowledge and achievement, musical taste or preference, and innate musical capacity. They may be divided into two groups: (a) tests and measurements of musical capacities; (b) tests and measurements of musical abilities. The former are independent

The Wing Standardized Tests of Musical Intelligence (1939–60), which became available in 1948 on ten records, included chord analysis, pitch change, memory, rhythmic accent, harmony, and intensity phrasing. Piano music was used in an attempt to place each of these tests in an integral musical setting. The 1957–58 revision was in the form of two types of tape recording, standard and long-playing. German and French editions, as well as an edition for the blind, have been made available.

All the capacity tests are measures of auditory

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RESEARCH ARTICLE

Assessing Musical Abilities Objectively: Construction and Validation of the Profile of Music Perception Skills

Lily N. C. Law, Marcel Zentner

Published: December 28, 2012 • https://doi.org/10.1371/journal.pone.0052508

Article | Authors | Metrics | Comments | Related Conte

The Advanced Measures of Music Audiation (AMMA) is a valid music aptitude test for college students (both music majors and nonmajors), high school students and junior high students. The entrie test takes less than 20 minutes to complete and yields tonal, rhythm and composite scores.

AMMA is crucial in helping music teachers adapt music instruction to the individual needs of their students. Students do not need to be able to read music or have prior music instruction to take AMMA.

The AMMA CD-ROM is self-scoring and is intended for use on a single computer. A five pack version to be run on up to five computers is available (G-3372CDROMB) at a 20% discount. A Site License may be purchased (G-3372CDROMS) which gives you 10 copies and may be loaded on an unlimited number of computers.

Edwin E. Gordon is Research Professor at the University of South Carolina and is the world's leading researcher in the music aptitude field.

Contents lists available at ScienceDirect

Learning and Individual Differences

The Musicality of Non-Musicians: An Index for Assessing Musical Sophistication in the General Population

Daniel Müllensiefen[1]*, Bruno Gingras[2], Jason Musil[1], Lauren Stewart[1]

1 Department of Psychology, Goldsmiths, University of London, London, United Kingdom, 2 Department of Cognitive Biology, University of Vienna, Vienna, Austria

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PLOS ONE

Abstract

Musical skills and expertise vary greatly in Western societies. Individuals can differ in their repertoire of musical behaviours as well as in the level of skill they display for any single musical behaviour. The types of musical behaviours we refer to here are broad, ranging from performance on an instrument and listening expertise, to the ability to employ music in functional settings or to communicate about music. In this paper, we first describe the concept of 'musical sophistication' which can be used to describe the multi-faceted nature of musical expertise. Next, we develop a novel measurement instrument, the Goldsmiths Musical Sophistication Index (Gold-MSI) to assess self-reported musical skills and behaviours on multiple dimensions in the general population using a large Internet sample (n = 147,636). Thirdly, we report results from several lab studies, demonstrating that the Gold-MSI possesses good psychometric properties, and that self-reported musical sophistication is associated with performance on two listening tasks. Finally, we identify occupation, occupational status, age, gender, and wealth as the main socio-demographic factors associated with musical sophistication. Results are discussed in terms of theoretical accounts of implicit and statistical music learning and with regard to social conditions of sophisticated musical engagement.

Citation: Müllensiefen D, Gingras B, Musil J, Stewart L (2014) The Musicality of Non-Musicians: An Index for Assessing Musical Sophistication in the General Population. PLoS ONE 9(2): e89642. doi:10.1371/journal.pone.0089642

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RESEARCH ARTICLE

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Published: December 28, 2012 • https://doi.org/10.1371/journal.pone.0052508

Article | Authors | Metrics | Comments | Related Conte

Measurement and Development of Musical Abilities

Arnold Bentley

Some Research Interests and Findings

My research interests in music education

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Learning and Individual Differences

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PLOS ONE

The Musicality of Non-Musicians: An Index for Assessing Musical Sophistication in the General Population

Daniel Müllensiefen[1]*, Bruno Gingras[2], Jason M

1 Department of Psychology, Goldsmiths, University of London, London, Unite

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Citation: Müllensiefen D, Gingras B, Musil J, Stewart L (2014) The Musical
Population. PLoS ONE 9(2): e89642. doi:10.1371/journal.pone.0089642

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RESEARCH ARTICLE

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Published: December 28, 2012 • https://doi.org/10.1371/journal.pone.0052508

Article | Authors | Metrics

Measurement and Development of Musical Abilities

Arnold Bentley

Some Research Interests and Findings

MUSEBAQ: A Modular Tool for Music Research to Assess Musicianship, Musical Capacity, Music Preferences, and Motivations for Music Use

Tan-Chyuan Chin
The University of Melbourne, Melbourne, Australia

Eduardo Coutinho
University of Liverpool, Liverpool, United Kingdom

Klaus R. Scherer
University of Geneva, Geneva, Switzerland

Nikki S. Rickard
The University of Melbourne & Monash University, Melbourne, Australia

Music engagement is complex and is influenced by music training, capacity, preferences, and motivations. A multi-modular self-report instrument (the Music Use

The impact of music on cognitive and emotional functioning is increasingly of interest to researchers and practitioners (MacDonald, Kreutz, & Mitchell, 2012; Rickard & McFerran, 2012). It is widely accepted that the effects of music are moderated by an individual's musical background and their level of engagement with music. For instance, researchers often distinguish between musicians and nonmusicians in their samples, and music therapists are likely to tailor their therapies based on a patient's music background. However, this distinction has often been limited to a gross measure of musicianship—such as years of formal music training—which fails to capture the myriad ways by which individuals engage actively with music. Several questionnaires have been developed that are designed to

Edwin E. Gordon is Research Professor at the University of South Carolina and is the world's leading researcher in the music aptitude field.

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RESEARCH ARTICLE

Musicians have better memory than nonmusicians: A meta-analysis

Francesca Talamini, Gianmarco Altoè, Barbara Carretti, Massimo Grassi

Published: October 19, 2017 • https://doi.org/10.1371/journal.pone.0186773

Correction

19 Jan 2018: Talamini F, Altoè G, Carretti B, Grassi M (2018) Correction: Musicians have better memory than nonmusicians: A meta-analysis. PLOS ONE 13(1): e0191776. https://doi.org/10.1371/journal.pone.0191776 | **View correction**

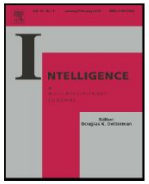
Abstract

Background

Several studies have found that musicians perform better than nonmusicians in memory tasks, but this is not always the case, and the strength of this apparent advantage is unknown. Here, we conducted a meta-analysis with the aim of clarifying whether musicians perform better than nonmusicians in memory tasks.

Contents lists available at ScienceDirect

Intelligence



Revisiting the association between music lessons and intelligence: Training effects or music aptitude?☆

Swathi Swaminathan [a], E. Glenn Schellenberg [b,*], Safia Khalil [a]

[a] Department of Psychology, University of Toronto, Toronto, ON, Canada
[b] Department of Psychology and Faculty of Music, University of Toronto, Toronto, ON, Canada

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Gene-environment interaction

ABSTRACT

We examined whether the link between intelligence and musical expertise is better explained by formal music lessons or music aptitude. Musically trained and untrained adults completed tests of nonverbal intelligence (Raven's Advanced Progressive Matrices) and music aptitude (Musical Ear Test). They also provided information about their history of music lessons and socioeconomic status (SES). Duration of music training was associated positively with SES (mother's education), nonverbal intelligence, melody aptitude, and rhythm aptitude. Intelligence and music aptitude were also positively associated. The association between music training and intelligence remained evident after controlling for SES, but it disappeared after controlling for music aptitude. By contrast, music aptitude had a strong correlation with intelligence even after accounting for music training and SES. Thus, the association between music training and intelligence may arise because high-functioning individuals are more likely than other individuals to have good aptitude for music and to take music lessons.

Journal
Psychological Inquiry ›
An International Journal for the Advancement of Psychological Theory
Volume 27, 2016 - Issue 3

Target Article

Process Overlap Theory: A Unified Account of the General Factor of Intelligence

Kristof Kovacs & Andrew R. A. Conway

Pages 151-177 | Published online: 02 Aug 2016

Download citation https://doi.org/10.1080/1047840X.2016.1153946 Check for updates

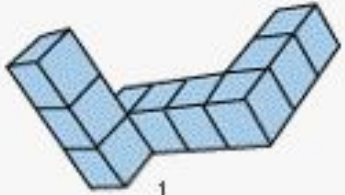
ABSTRACT

The most replicated result in the field of intelligence is the positive manifold, which refers to an all-positive pattern of correlations among diverse cognitive tests. The positive manifold is typically described by a general factor, or *g*. In turn, *g* is often identified as general intelligence, yet this explanation is contradicted by a number of results. Here we offer a new account of *g*: process overlap theory. According to the theory, cognitive tests tap domain-general executive processes, identified primarily in research on working memory, as well as more domain-specific processes. Executive processes are tapped in an overlapping manner across cognitive tests such that they are required more often than domain-specific ones. The theory provides an account of a number of findings on human intelligence. As well, it is formalized as a multidimensional item response model and as a structural model, and the neural mechanisms underlying the proposed overlapping processes are discussed.

Keywords: Cognitive abilities, differentiation, factor analysis, goal neglect, individual differences, intelligence, prefrontal cortex, working memory, worst performance rule

Positive Manifold and *g*

Standard



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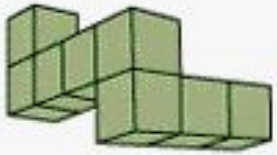

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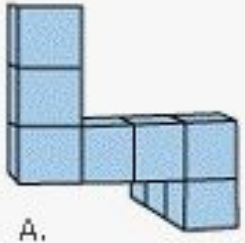

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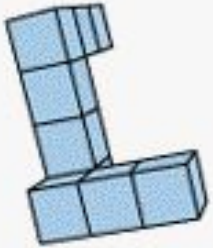

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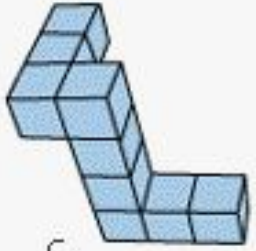

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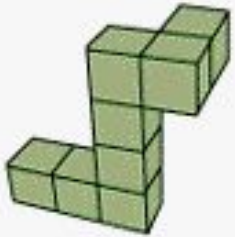

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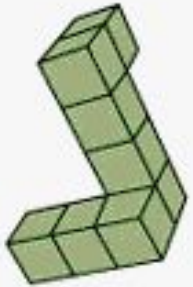

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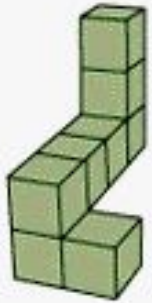

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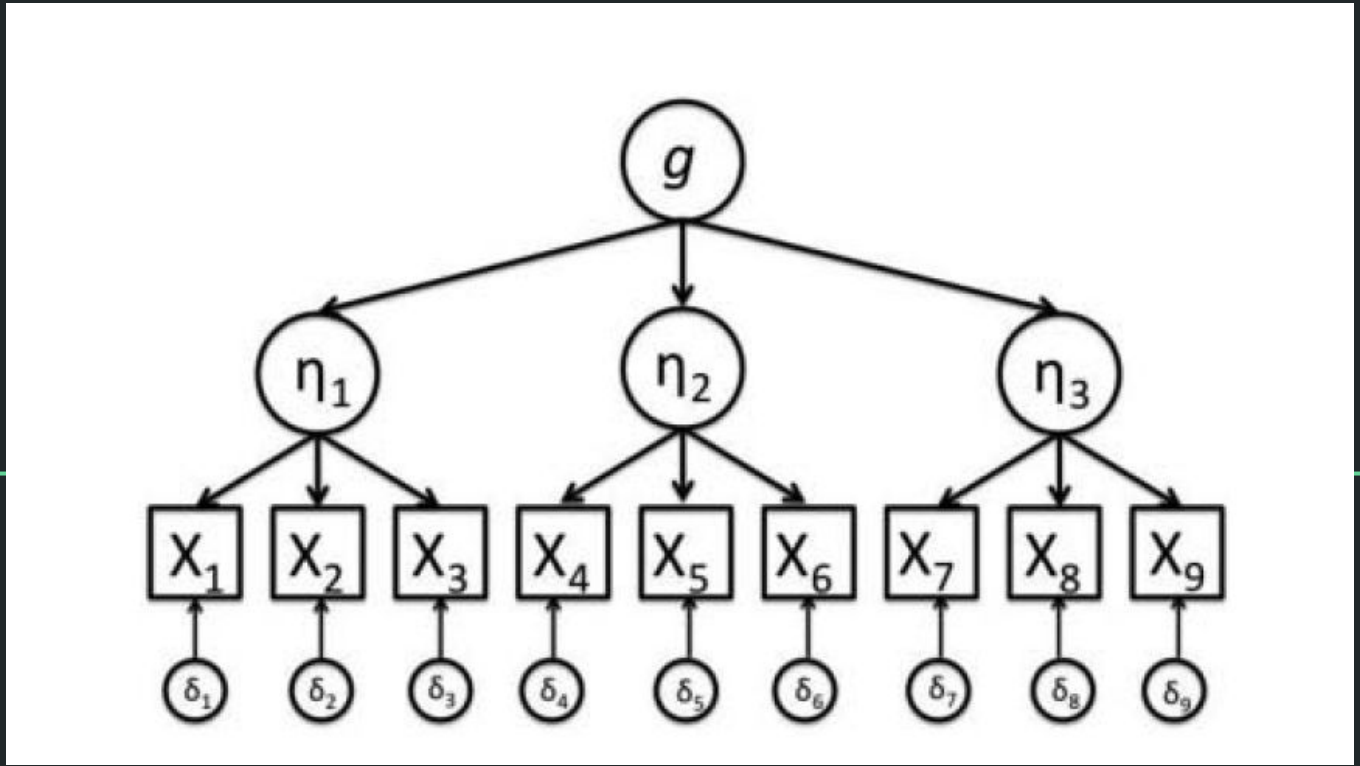
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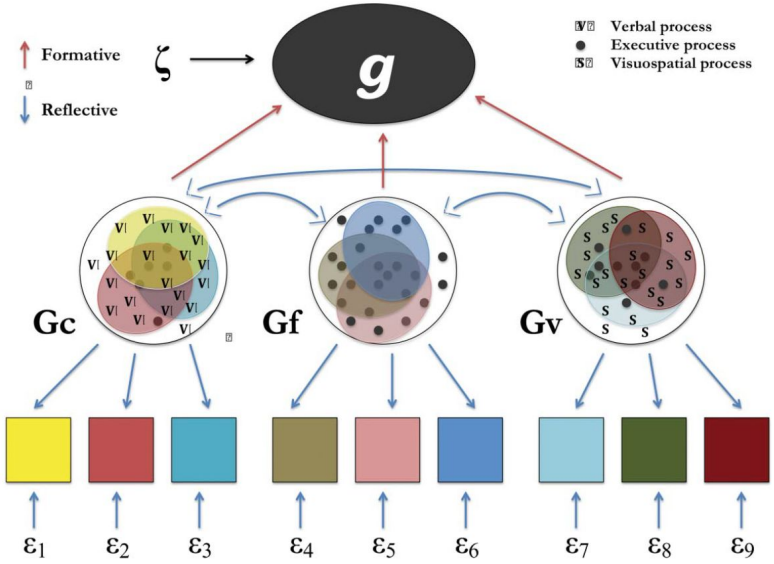
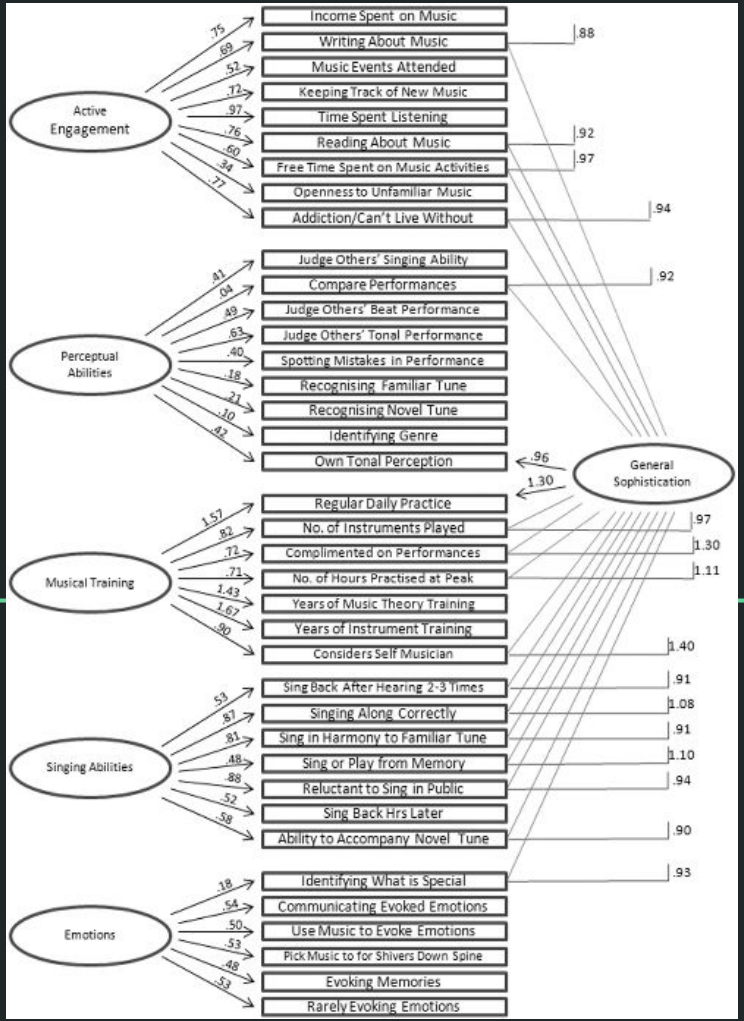


Figure 8. Process overlap theory as a latent variable model.



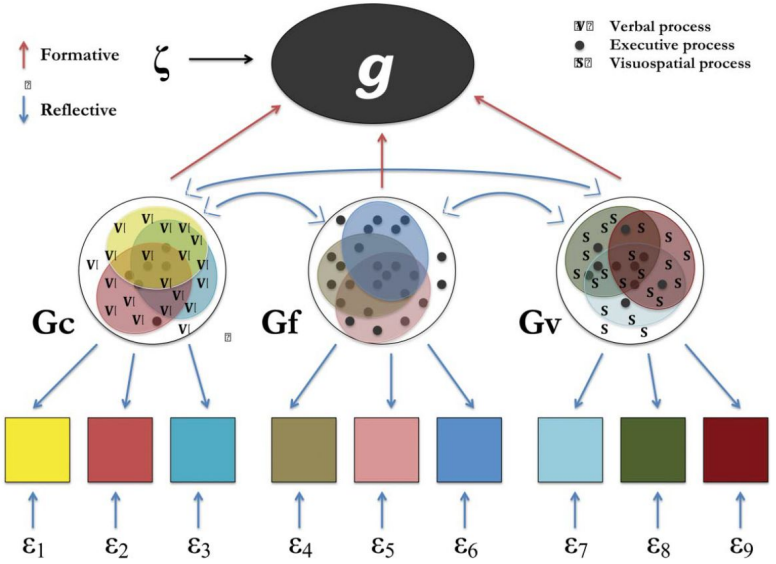


Figure 8. Process overlap theory as a latent variable model.

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.

Neuron
NeuroView

What Does It Mean to Be Musical?

Daniel J. Levitin[1,*]
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*Correspondence: dlevitin@psych.mcgill.ca
DOI 10.1016/j.neuron.2012.01.017

Music can be seen as a model system for understanding gene × environment interactions and how these can influence neurocognitive development. The concept of musicality, however, is underspecified and not well understood. Here, I propose a framework for defining musicality to provide a foundation for studying the contributions of biological and environmental factors.

Musical ability is popularly regarded to be innate: one either is or is not born with musical talent. Increasingly, neuroscientists are collaborating with geneticists to understand the links between genes, brain development, cognition, and behavior (Ebstein et al., 2010; Posner et al., 2011). Music can be seen as a model system for understanding what genes can accomplish and how they relate to experience

brain centers bring this information together, binding it into representations of contour, melody, rhythm, tempo, meter, and, ultimately, phrases and whole compositions. The idea that music processing can be broken down into component operations was first proposed as a conceptual tool by cognitive theorists and has been confirmed by neuroimaging studies (Levitin and Tirovolas, 2009)

and harmonic structure, have been linked to particular neural processing networks. Listening to music activates reward and pleasure circuits in the nucleus accumbens, ventral tegmental area, and amygdala, modulating production of dopamine (Menon and Levitin, 2005). The generation of musical expectations is a largely automatic process in adults, developing in childhood, and is believed to be critical

Neuron
NeuroView

What Does It Mean to Be Musical?

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Montreal QC H3A 1B1, Canada
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nature neuroscience

Review

Modularity of music processing

Isabelle Peretz & Max Coltheart

Nature Neuroscience **6**, 688–691 (2003)
doi:10.1038/nn1083
Download Citation

Received: 18 March 2003
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Abstract

The music faculty is not a monolithic entity that a person either has or does not. Rather, it comprises a set of neurally isolable processing components, each having the potential to be specialized for music. Here we propose a functional architecture for music processing that captures the typical properties of modular organization. The model rests essentially on the analysis of music-related deficits in neurologically impaired individuals, but provides useful guidelines for

Positive Returns

PLOS ONE

RESEARCH ARTICLE

"If You Have to Ask, You'll Never Know": Effects of Specialised Stylistic Expertise on Predictive Processing of Music

Niels Chr. Hansen[1,2,3,4]*, **Peter Vuust**[1], **Marcus Pearce**[3]

1 Center for Music in the Brain, Department of Clinical Medicine, Aarhus University & The Royal Academy of Music Aarhus/Aalborg, Aarhus, Denmark, **2** School of Communication and Culture, Aarhus University, Aarhus, Denmark, **3** Cognitive Science Research Group and Centre for Digital Music, Queen Mary, University of London, London, United Kingdom, **4** Cognitive and Systematic Musicology Laboratory, School of Music, Ohio State University, Columbus, OH, United States of America

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frontiers in Psychology

ORIGINAL RESEARCH
published: 04 May 2017
doi: 10.3389/fpsyg.2017.00662

Perception of Leitmotives in Richard Wagner's Der Ring des Nibelungen

David J. Baker[1]* *and Daniel Müllensiefen*[2]

[1] *Music Cognition and Computation Lab, School of Music and Dramatic Arts, Louisiana State University, Baton Rouge, LA, USA,* [2] *Music, Mind and Brain Lab, Department of Psychology, Goldsmiths, University of London, London, UK*

The music of Richard Wagner tends to generate very diverse judgments indicative of the complex relationship between listeners and the sophisticated musical structures in Wagner's music. This paper presents findings from two listening experiments using the music from Wagner's *Der Ring des Nibelungen* that explores musical as well as individual listener parameters to better understand how listeners are able to hear leitmotives, a compositional device closely associated with Wagner's music. Results confirm findings from a previous experiment showing that specific expertise with Wagner's music can account for a greater portion of the variance in an individual's ability to recognize and remember musical material compared to measures of generic musical training. Results also explore how acoustical distance of the leitmotives affects memory recognition using a chroma similarity measure. In addition, we show how characteristics of the compositional structure of the leitmotives contributes to their salience and memorability. A final model is then presented that accounts for the aforementioned individual differences factors, as well as parameters of musical surface and structure. Our results suggest that that future work in music perception may consider both individual differences variables beyond musical training, as well as symbolic features and audio commonly used in music information retrieval in order to build robust models of musical perception and cognition.

Keywords: musical memory, leitmotives, opera, symbolic notation, computational Modeling

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1. INTRODUCTION

While Richard Wagner and his music have been the topic of a wide range of musicological and music theoretic research (Bailey, 1977; Deathridge and Dahlhaus, 1984; Dreyfus, 2012), the compositional techniques Wagner developed and their effect on listeners has not received nearly as much attention from the music psychology community. This may be due to the fact that Wagner's music does not make use of tonality in the traditional sense, but rather has been aptly described by David Huron as "contracadential" and very harmonically sophisticated (Huron, 2006). Huron notes that the complexity in Wagner's music may be attributed to its cadential content in that his cadences are "almost entirely divorced from perceptual or formal segmentation" (Huron, 2006, p. 338) making his music difficult to process for listeners who do not have prior listening experience.

In addition to the difficulty delineating cadential structures in his music, Wagner also composed his melodic material in order to avoid the regularity that is found in other 19th century composers (Dahlhaus, 1980; Grey, 2007). This conscious choice to write melodic material that seems to be endless and avoids easy segmentation often leads to difficulties for listeners, which results in thwarted and delayed expectations of musical events. Despite these inherent difficulties in parsing his cadential and melodic material, the continued popularity of his music for people at various

Musical Flynn Effects?

Questions?
@DavidJohnBaker
#musiCola