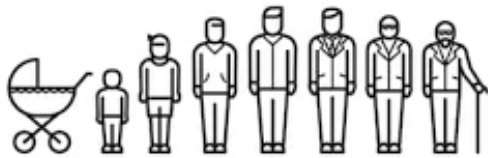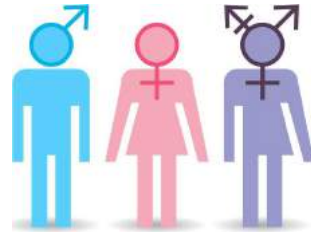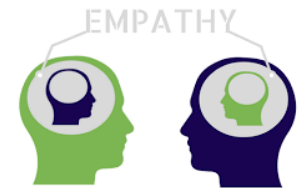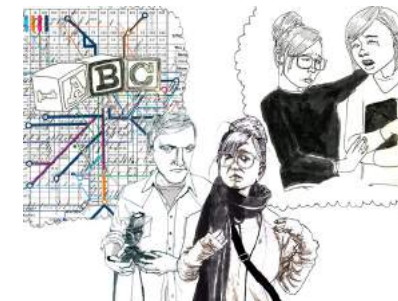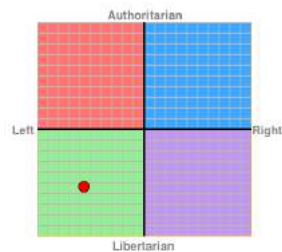# Individual Differences

age

gender

traits

skills

states/arousal level
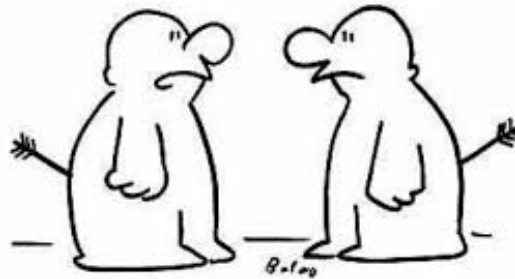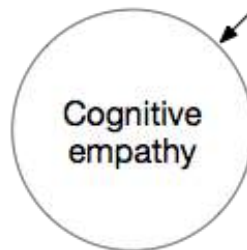
cognitive styles

political leanings

disease/brain disorders

Empathy

"I know exactly how you feel."

EMPATHY

Cognitive empathy

Rational understanding, ability to take someones perspective
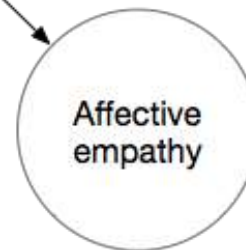
Affective empathy

Emotional connection, being able to feel what they feel

EMPATHY
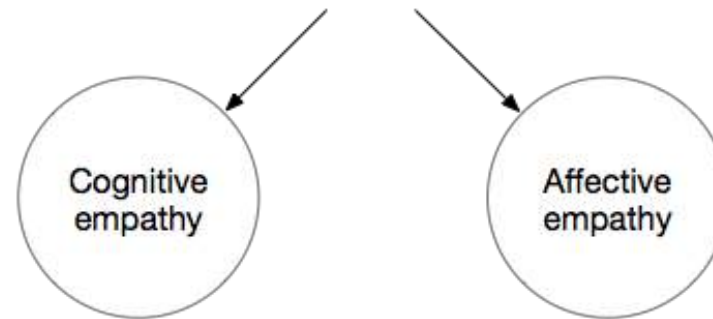
Cognitive empathy

Rational understanding, ability to take someones perspective

Affective empathy

Emotional connection, being able to feel what they feel

Interpersonal Reactivity Index

(IRI; Davis, 1983): measure of dispositional empathy that takes the notion that empathy consists of a set of separate but related constructs.

PERSPECTIVE TAKING	the tendency to spontaneously adopt the psychological point of view of others
FANTASY	Tendency to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays
EMPATHIC CONCERN	"other-oriented" feelings of sympathy and concern for unfortunate others
PERSONAL DISTRESS	"self-oriented" feelings of personal anxiety and unease in tense interpersonal settings)

MEASUREMENTS

No Empathy

Empathizing

Too Much Empathy

Subject   Object

Subject   Object

Subject   Object

Cognitive Perspective-taking

Emotional Convergence
Empathic Responding
Pro-social behaviour

Personal Distress
Mortal Salience
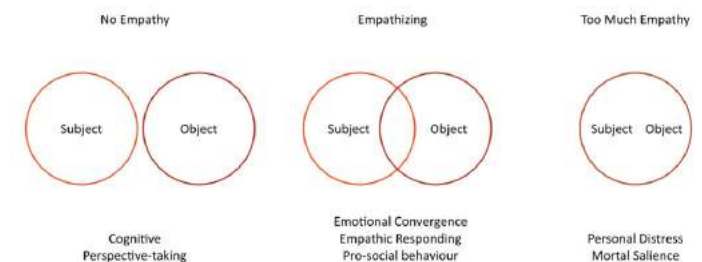
"people who feel the pain of sad songs may be better at feeling the pain of other human beings (*fantasy*)"

Vuoskoski, J. K., Thompson, B., McIlwain, D., and Eerola, T. (2012). **Who enjoys listening to sad music and why?** Music Percept. 29, 311–317
T Eerola, JK Vuoskoski, H Kautiainen (2016) **Being moved by unfamiliar sad music is associated with high empathy** Frontiers in psychology.

"trait *empathic concern* was positively associated with feeling moved or touched by music"

Vuoskoski, J. K., et al, (2022). **Feeling moved by music: Investigating continuous ratings and acoustic correlates.** PLoS One

'passive' listening to the music of an unfamiliar culture can significantly change the cultural attitudes of listeners with high dispositional empathy
(could lead to implicit positive attitudes)

Clarke et al. 2015. **Music, empathy and cultural understanding.** Physics of Life Reviews Volume 15, December 2015, Pages 61-88

Study: Music and intercultural affiliatio
(Vuoskoski, Clarke, & DeNora, 2017)
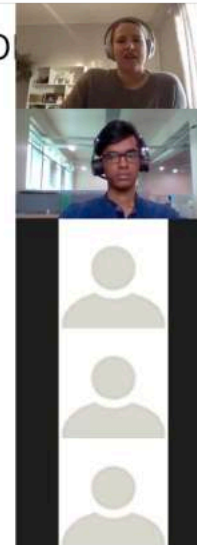
1:11 - 1:23

Can Musical tastes offer a window into how you think?

Greenberg DM, Baron-Cohen S, Stillwell DJ, Kosinski M, Rentfrow PJ (2015) **Musical Preferences are Linked to Cognitive Styles**. PLoS ONE 10(7): e0131151. https://doi.org/10.1371/journal.pone.0131151

Empathizing-systemizing theory
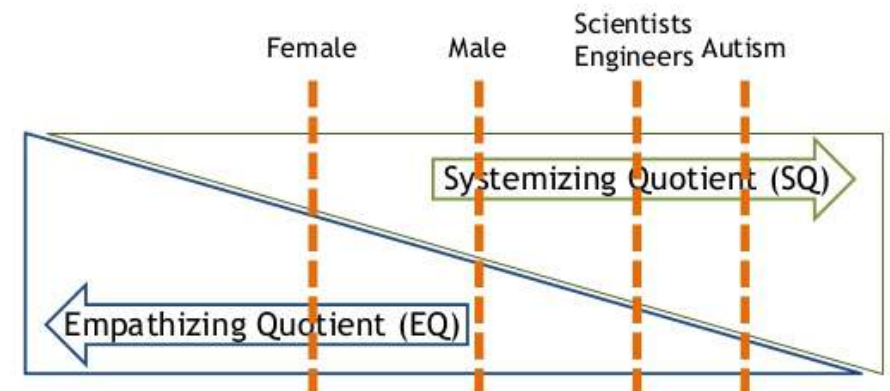
'**empathizer**' who likes to focus on and respond to the emotions of others

systemizer' who likes to analyse rules and patterns in the world

Empathizing-systemizing theory

| | Female | Male | Scientists Engineers | Autism |

Systemizing Quotient (SQ)

Empathizing Quotient (EQ)

MUSIC model of preferences

- **M**ellow (featuring romantic, relaxing, unaggressive, sad, slow, and quiet attributes; such as in the soft rock, R&B, and adult contemporary genres);
- **U**npretentious (featuring uncomplicated, relaxing, unaggressive, soft, and acoustic attributes; such as in the country, folk, and singer/songwriter genres);
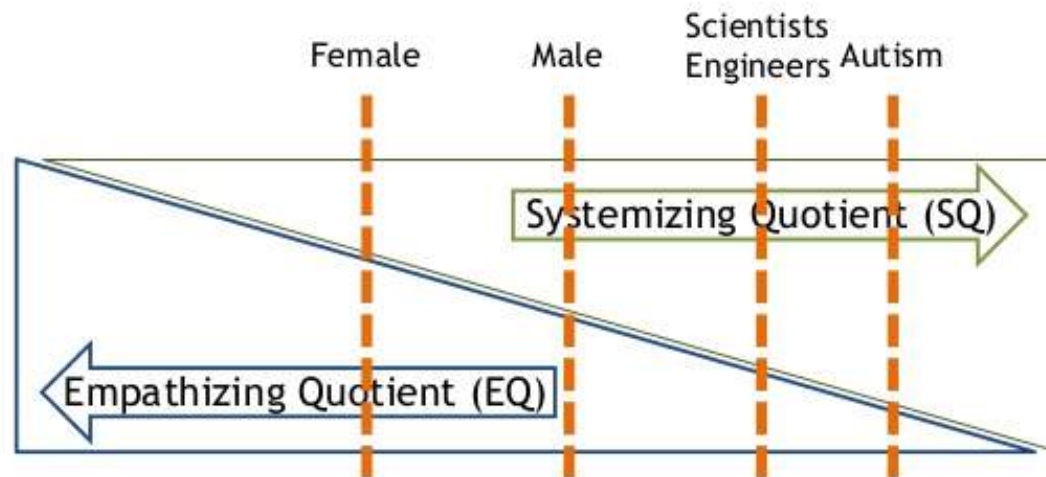- **S**ophisticated (featuring inspiring, intelligent, complex, and dynamic attributes; such as in the classical, operatic, avant-garde, world beat, and traditional jazz genres);
- **I**ntense (featuring distorted,loud, aggressive, and not relaxing, romantic, nor inspiring attributes; such as in the classic rock, punk, heavy metal, and power pop genres);
- **C**ontemporary (featuring percussive, electric, and not sad; such as in the rap, electronica, Latin, acid jazz, and Euro pop genres).

MUSIC model

Attribute/genre	Music-preference factor				
	Mellow	Unpretentious	Sophisticated	Intense	Contemporary
Sound-related attributes					
Dense	−.02	−.07	−.08	.22*	−.01
Distorted	−.16*	−.31*	−.42*	.67*	.09
Electric	−.05	−.25*	−.66*	.54*	.32*
Fast	−.43*	−.22*	−.07	.41*	.08
Instrumental	.05	−.31*	.30*	.05	.04
Loud	−.38*	−.26*	−.27*	.64*	−.03
Percussive	−.11	−.11	−.53*	.49*	.17*
Psychological attributes					
Aggressive	−.47*	−.48*	−.22*	.66*	.08
Complex	−.18*	−.41*	.34*	.14	.08
Inspiring	.09	−.10	.55*	−.32*	−.11
Intelligent	.18*	−.15*	.58*	−.40*	−.08
Relaxing	.56*	.15*	.32*	−.54*	−.07
Romantic	.57*	.18*	.23*	−.49*	−.10
Sad	.32*	.15*	.01	−.10	−.24*

Rentfrow, P. J., Goldberg, L. R., & Levitin, D. J. (2011). **The structure of musical preferences: A five-factor model**. Journal of Personality and Social Psychology, 100(6), 1139–1157. doi:10.1037/a0022406

MUSIC model

Attribute/genre	Music-preference factor				
	Mellow	Unpretentious	Sophisticated	Intense	Contemporary
Genres					
Soft rock	.33*	.07	−.06	−.10	−.12
R&B/soul	.31*	.04	−.11	−.10	.06
Quiet storm	.26*	−.03	−.02	−.12	.13
Adult contemporary	.18*	.08	.05	−.15*	−.01
New country	.05	.46*	−.15	−.10	−.15
Mainstream country	.00	.36*	−.20*	−.12	−.09
Country rock	.03	.33*	−.13	−.12	−.11
Bluegrass	−.11	.33*	.00	−.11	−.16*
Rock-n-roll	−.09	.17*	−.06	−.04	.02
Classical	.04	−.19*	.37*	−.09	−.19*
Marching band	−.14	.01	.35*	−.13	−.18*
Avant-garde classical	−.05	−.13	.32*	−.05	−.10
Polka	−.23*	.01	.28*	−.12	−.06
World beat	−.06	−.10	.16*	−.07	.09
Traditional jazz	.04	−.13	.15*	−.12	.10
Celtic	−.06	−.01	.12	−.03	−.03
Classic rock	−.06	−.11	−.26*	.50*	−.16*
Punk	−.19*	−.19*	−.18*	.46*	−.09
Heavy metal	−.20*	−.21*	−.16*	.43*	−.09
Power pop	.02	−.07	−.10	.22*	−.04
Alternative rock	.03	−.02	−.15*	.14	−.10
Rap	−.17*	−.20*	−.25*	−.06	.51*
Electronica	.10	−.14	−.05	−.04	.24*
Latin	.01	−.09	.14	−.11	.20*
Acid jazz	−.13	−.10	.05	−.05	.19*
Europop	.02	−.09	−.12	.02	.19*

Empathy

"I know exactly how you feel."

HIGH SCORE
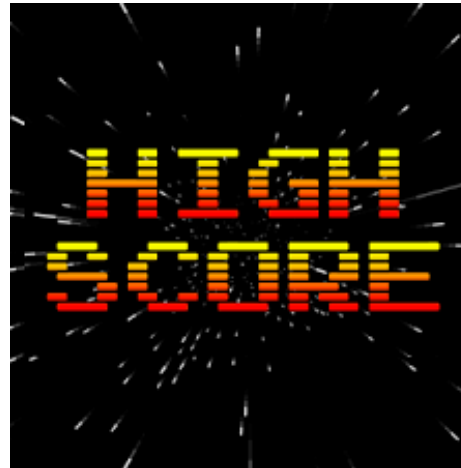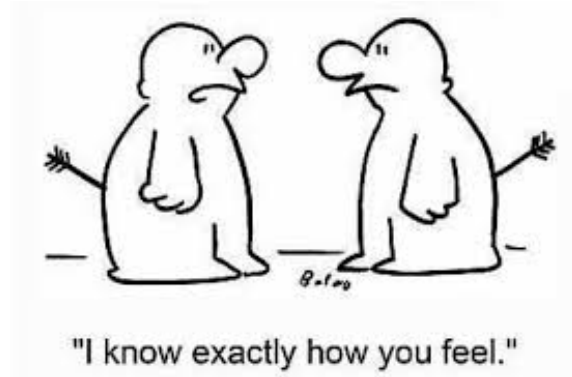
SYSTEMIZE

low energy (gentle, reflective, sensual, and warm elements), or **negative emotions** (sad and depressing characteristics), or **emotional depth** (poetic, relaxing, and thoughtful features)

high energy (strong, tense, and thrilling elements), or **positive emotions** (animated and fun features), and which also featured a high degree of **cerebral depth** (complexity)

Empathy

"I know exactly how you feel."

HIGH SCORE
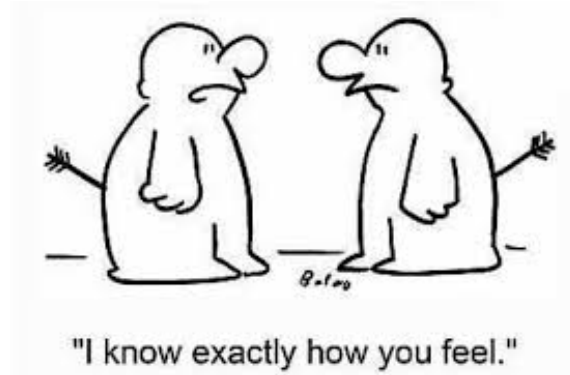
SYSTEMIZE

empathisers prefer **M**ellow music (from R&B, soft rock, and adult contemporary genres), **U**npretentious music (from country, folk, and singer/songwriter genres) and **C**ontemporary music (from electronica, Latin, acid jazz, and Euro pop). They disliked intense music, such as punk and heavy metal

systemizers favoured **I**ntense music, but disliked mellow and unpretentious musical styles (punk, heavy metal, and hard rock).
preferred music that featured high arousal (strong, tense, and thrilling), and aspects of positive valence and cerebral depth (complexity)

THERE'S TWO KINDS OF
PEOPLE IN THE WORLD -
THOSE WHO LISTEN TO THE
LYRICS

AND THOSE WHO LISTEN
TO THE MUSIC

Music or Lyrics?
Individual differences associated with listening strategies

Sidhant Subramanian[1], Anant Mittal[1,2], Jonna Vuoskoski[3], Vinoo Alluri[1]

[1]International Institute of Information Technology, Hyderabad, India [2]Vehant Technologies, Noida, India [3]University of Oslo, Norway

UiO : University of Oslo

Background

- Musical experiences and engagement strategies are known to be modulated by individual differences
- On one end, lyrics are crucial in contributing to musical enjoyment for many, while for some it is all about the way music sounds; the voice becomes yet another timbre irrespective of the content

Aim

- First formulate a tool to identify an individual's natural affinity towards appreciation of music vs lyrics.
- Identify personality traits (including empathic and emotional traits) associated with the same.

Method

Music-or-Lyrics scale

Sources: npr, Quora, odyssey

1. Lyrics are very important to me when I listen to music.
2. I almost never listen to lyrics. All I can appreciate is good music. I know some lyrics but that are just for 'singing along' purposes. May be just a good alternative to 'la la la'.
3. Music is what is important. Even the vocals are just another instrument or texture.
4. For me, lyrics are 'as important' as music in a song. I can't really appreciate music without good lyrics.
5. Good lyrics do not suddenly make bad music "good." But, good music with bad lyrics is fine with me. I probably wouldn't even notice that the lyrics are "bad" because I just simply don't care.
6. My friend is always talking about how great such and such song is. When I comment that I don't think it is anything special, she tries to convince me of how deep the meaning is, etc. I think she has finally figured out that I just don't hear words in songs.

Qualitative Research

* The 3rd and 5th items were dropped from the final scale leading to an increase in internal consistency, Cronbach Alpha value changed from 0.68 to 0.74.
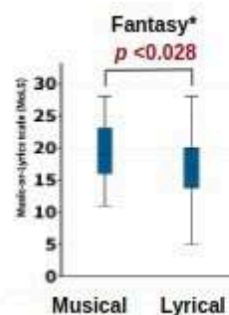
N = 318
mean = 32 yrs
sd = 12.45 yrs
138 males

Big-Five Inventory

Interpersonal Reactivity Index

MoLs

Barcelona Music Reward Questionnaire (BMRQ)

Emotional Contagion

Musical

MoLs

Lyrical

Mann-Whitney U Test

Bootstrapping
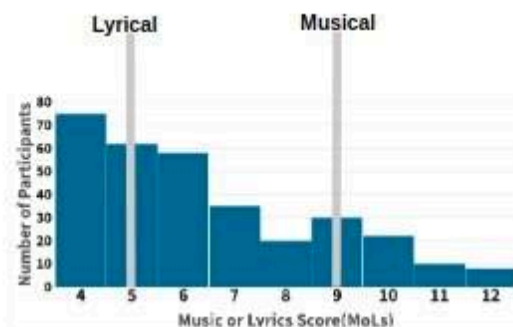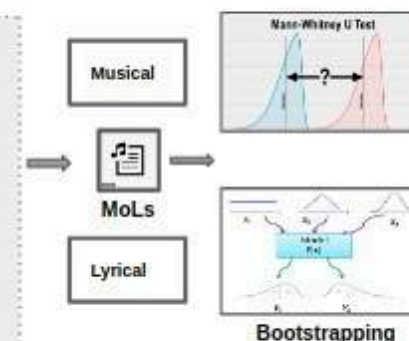
Results
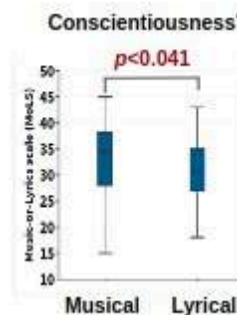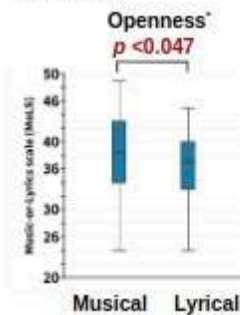
Mann-Whitney U

| Traits	U-Statistic
Openness to experience	1126.5
Conscientiousness	1117.5
Fantasy	1086

* Cronbach alpha > .7

Conclusion

- The traits *Openness to experience*, *Fantasy* and *Conscientiousness* have higher predilection for music.
- The current study extends these findings to a preferential focus on music versus lyrics from personality to empathic traits.
- These findings have significant implications for the field of music recommendation since individual differences related to personality are associated with music preferences.

References

Mas-Herrero, E., Marco-Pallares, J., Lorenzo-Seva, U., Zatorre, R. J., & Rodriguez-Fornells, A. (2013). Individual Differences in Music Reward Experiences. *Music Perception, 31*(2), 118–138. Vuoskoski, J. K., Thompson, W. F., McIlwain, D., & Eerola, T. (2011). Who enjoys listening to sad music and why? *Music Perception, 29*(3). 311-317
Anderson, I., Gil, S., Gibson, C., Wolf, S., Shapiro, W., Semerci, O., & Greenberg, D. M. (2020). "Just the Way You Are": Linking Music Listening on Spotify and Personality. *Social Psychological and Personality Science.*

Empathizing-systemizing theory
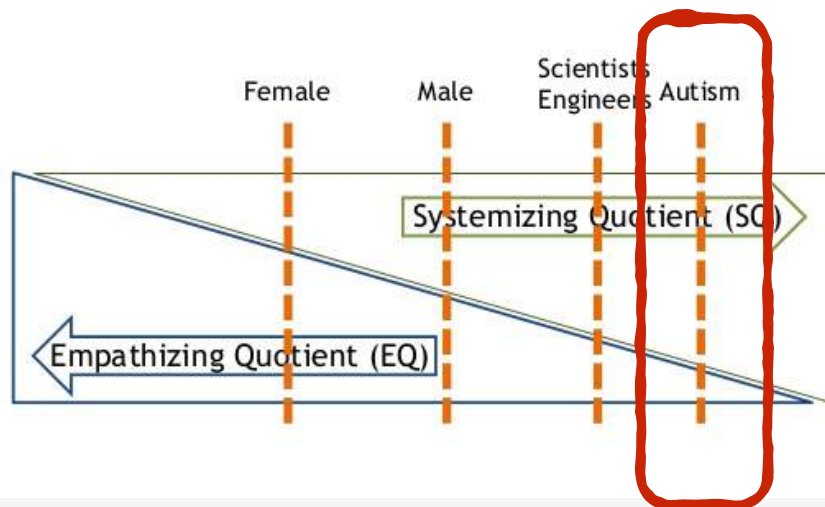
"Music is a mirror of the self. Music is an expression of who we are **emotionally**, **socially**, and **cognitively**"

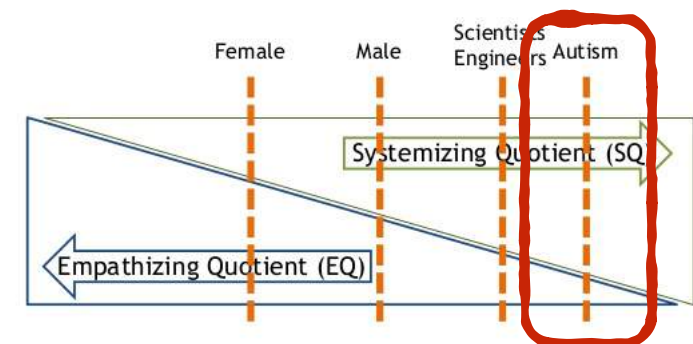Greenberg DM, Baron-Cohen S, Stillwell DJ, Kosinski M, Rentfrow PJ (2015) **Musical Preferences are Linked to Cognitive Styles**. PLoS ONE 10(7): e0131151. https://doi.org/10.1371/journal.pone.0131151

Music and Autism

	Attributes	Genres
Mellow	romantic, relaxing, unaggressive, sad, slow, and quiet musical attributes	soft rock, R&B, and adult contemporary genres
Unpretentious	uncomplicated, relaxing, unaggressive, soft, and acoustic	country, folk, and singer/songwriter genres)
Sophisticated	inspiring, intelligent, complex, and dynamic	classical, operatic, avantgarde, world beat, and traditional jazz
Intense	distorted, loud, and aggressive	classic rock, punk, heavy metal, and power pop
Contemporary	percussive and electric	rap, electronica, Latin, acid jazz, and Euro pop

hypothesis: increase empathy

ABAI — Association for Behavior Analysis International

SMPC — Society for Music Perception and Cognition

Empathizing-systemizing theory

Female | Male | Scientists Engineers | Autism

Systemizing Quotient (SQ)

Empathizing Quotient (EQ)

Musical genre preferences
in Autism Spectrum Disorder

Authors and affiliations

Anthony Levasseur[1,2], Kevin Jamey[1,2,3], Nicholas E. V. Foster[1,2,3], Krista L. Hyde[1,2,3], Simone Dalla Bella[1,2,3]

1 International Laboratory for Brain Music and Sound Research (brams.org), University of Montreal, Montreal, Canada.
2 Department of Psychology, University of Montreal, Montreal, Canada.
3 Centre for Research on Brain, Language and Music, Faculty of Medicine, McGill University, Montreal, Canada

Music and Autism

METHODS

Parent-reported questionnaire on musical taste :
What are the main types of music your child listens to? Please choose all that apply:

- Classical
- Jazz
- Pop
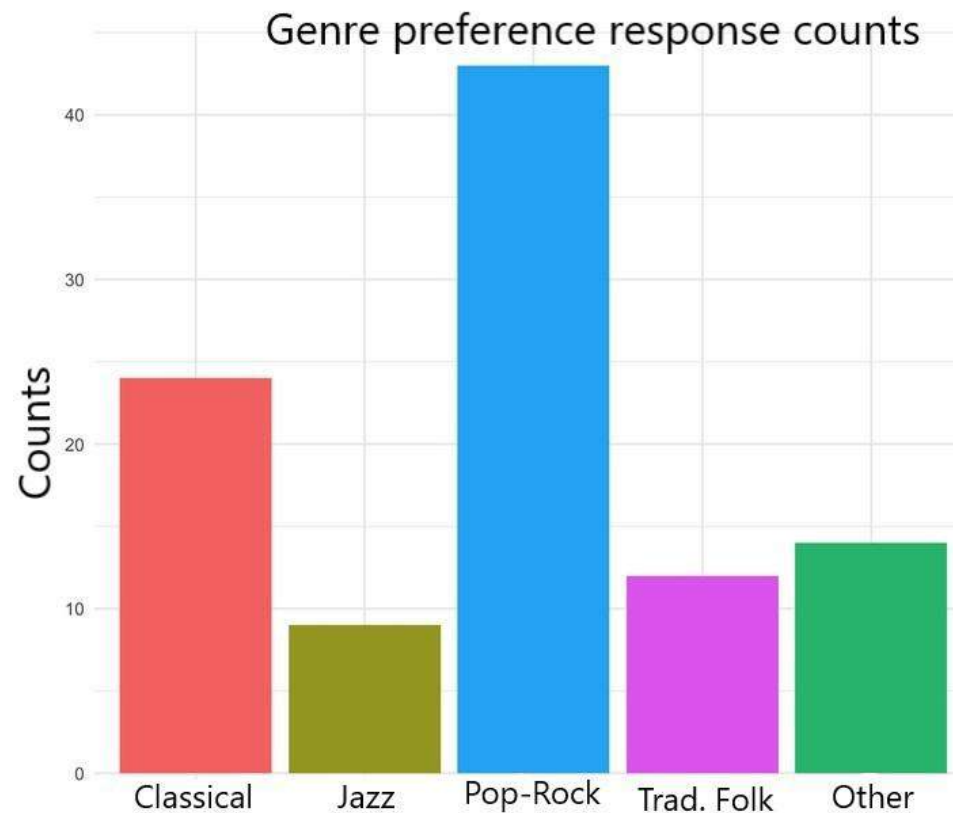- Rock
- Traditional/Folk
- Other (please specify)

Additional Measures :

|	
Symptom severity	Social Responsiveness Scale-2 (**SRS2**)
Verbal ability	Clinical Evaluation of Language Fundamentals (**CELF4**)
Spatial Reasoning	PIQ from the Wechsler Adult Intelligence Scale, Fourth Ed. (**WAIS-IV**)

Analysis :

	Analysis A (chi-square)	Analysis B (log. regression)
N	53	38
Response Counts; range	130 (1-7)	92 (1-5)
Age : mean (sd); range	10.22 (1.85); 6.17-12.94	10.19 (1.75); 6.17-12.6
SRS-2 : Mean (sd); range	NA	70.6 (9.43); 55-90
CELF-4 : Mean (sd); range	NA	5.95 (4.14); 1-14
PIQ : Mean (sd); range	NA	106.77 (18.77); 68-138

Music and Autism

Genre preference response counts

- Responses of preference were not distributed equally among genres (p<0.001)

- Pop-Rock was preferred to other genres in ASD (p<0.009)

- Pop-rock was more prefered than classical music (p<0.02), but did not pass bonferroni correction for multiple comparisons.

Music and Autism

Classical music preference according to symptom severity in logit
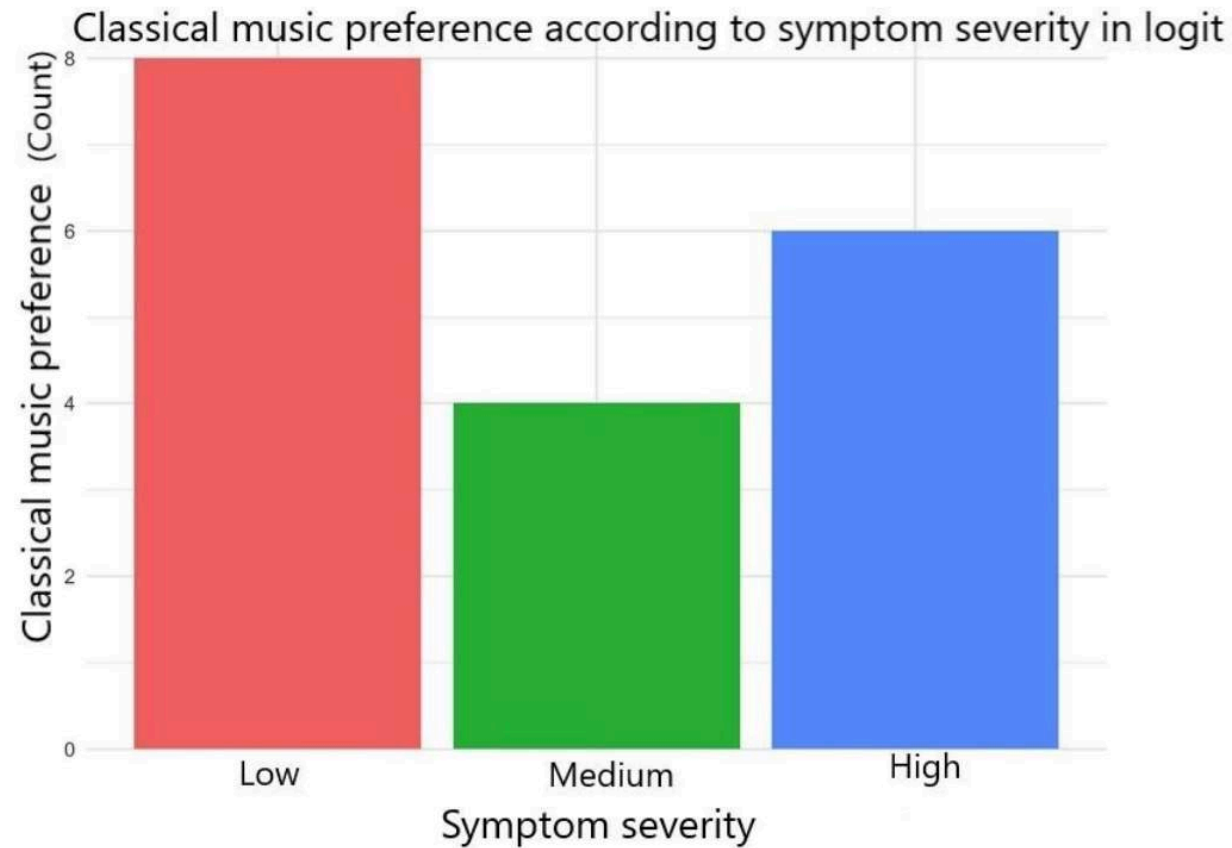
Music, Social Media and Autism/ADD

ASD:

Well, some bands and songs and concerts are special interests for me.

I literally don't know how many times I've played the new Arctic Monkeys album in the last *two days* alone. I've had it on repeat the *whole time*, including while I was sleeping and showering. I'm 100% not tired of it yet.

I can do the same thing with any Muse album, most Green Day albums, any Streetlight Manifesto album, any Fratellis album, any Black Keys album, Fleetwood Mac's self-titled and Rumours, and...I could go on and on.

Some songs I can play on repeat, especially if they help me process feelings. I can *always* put Rhapsody in Blue on repeat. Sometimes I can even loop shorter songs, notably Bravado and Liability by Lorde when I'm angsty.

Around the beginning of the year, I looped a playlist composed entirely of various versions of What Are You Doing New Year's Eve all day and overnight, because I wanted to record myself singing/playing it.

Speaking of playlists, I have a Spotify playlist consisting exclusively of *one* single song, All Of Me by John Legend, expressly created for the sole purpose of making it easier to loop that song ceaselessly until I decide I'm done with it.

When I saw the Fratellis in concert, I did not expect to fangirl *real* hard... even shrieking and *sobbing* when they played my favorite song...

Because, all the six or seven times I've seen Streetlight Manifesto, I've *never* cried, I've just shouted out the words. At least I'm not the *only* fan who memorizes the extremely complex and very long lyrics to every song! But I do seem to be the only one who is *adamant* about going to see them on every single tour, sometimes *twice*, even out-of-state, even though my friends are the ones who dragged me to my *first* Streetlight concert...

I know I have some auditory sensitivities and I also know that I'm sometimes pretty emotionally sensitive. Some artists and music are upsetting or intolerable to me for various reasons.

The first thing that came to mind was some whiny, nasally singers that make me want to smack them upside the head and tell them to stop singing like that. That Nirvana guy and I think it's Green Day that also sings that way. The next ones are those screaming ear-piercing higher note singers that do it like Mariah Carey or Whitney Houston. I'm not sure how to explain that but it's 'messy' to my ears because a 1st Soprano opera singer hitting high notes doesn't have the same effect.

Death metal where a man is doing what sounds like demon screaming is intolerable. It makes me feel icky or makes me want to hurt people. My first husband used to say it made him feel better when he was angry. I never understood that. Rap, in general, because I either can't understand them or because when I can I don't like what I hear lyrically. It also makes me feel bad, as in negative or sometimes like a bad person. It's dark and offensive usually and I've learned long ago to be careful about anything I consume through every means. Some classical music that's too busy and messy I also find to be agitating.

I hate the electric keyboard. I prefer acoustic guitar. Love drums, banjo (especially when they put it in a rock song), and the cello. Horns too, but not really flutes and such. I like more complicated music and/or great lyrics. While some pop music is catchy, I feel stupid listening to it. Not ashamed, but like I'm actually getting dumber. Country music is also pretty dumb. Since we're talking about sound, I'll also throw in that I like Tibetan singinging bowls, harps, wind chimes, and the didgeridoo.

P.S. Country music guys, please stop trying to rap.

Music, Social Media and Autism/ADD

Harroll Morris, Diagnosed as autistic, am high functioning Asperger's
Answered May 17, 2018

That is basically unanswerable. I like many different kinds of music. I know what I like when I hear it. I want to listen to different music depending on my mood. I don't like much that is rap, and I don't like heavy metal, yet I listen to Christian versions of both on the playlist in my car. I don't care for older country that I consider to be torture of innocent instruments, and an annoying nasal twang. Much of modern country is basically yesterday's pop music. I can find that to be grating.

I like classical music, Celtic music instrumental, music from renaissance fairies, religious hymns, def leopard, Lenard skinard, Aerosmith, U2, Bon Jovi, rock that is sort of medium from the 70's and 80's. Sometimes I need the music to be soft, sometimes I need it to be fast, hard rock, but I can't listen to any of it really load as it tends to cause me to stim. If I go to a concert I can't be too near the stage or speakers, and need a person whose presence I find comforting or I stim. I hate sounds and noise on computer games which I spend an inordinate amount of time on. Music is not one of my special interests so I can't tell you everything there is to know about any musician or musical group.

i can't think of any way that particular mishmash of musical likes and dislikes is related to my autism other than being unable to tolerate certain conditions such as loud noises and flashing lights.

Andrea Nicole Williams, Autistic adult female metalhead
Answered Oct 4, 2020

I have Aspenger's and I prefer metal/hard rock music myself. Sometimes classical like Beethoven and then Southern Rock like Lynnard Skynnard and Charlie Daniels.

Christopher Hansen, I have high functioning autism.
Updated Jan 8, 2020

I love thrash metal the best and play it too on the electric guitar. I have a nice rig, which is an Engl Fireball 100 and it punches quite nicely. My signal chain is on the front end is a Wampler compressor into a ts9 into an MXR graphic equalizer, all slamming the front end of the preamp tubes creating a wonderful saturated overdrive sound with just enough gain from the amp to fill it in. I have a clean boost pedal in the fx loop also just because I like the way it sounds. The whole signal including the head go through the MXR noise clamp to keep things reasonable, all running into an Engl 4x12 cab... It sounds majestic. Also I like sometimes electronic music, bluegrass, and classical music.

Music, Social Media and Autism

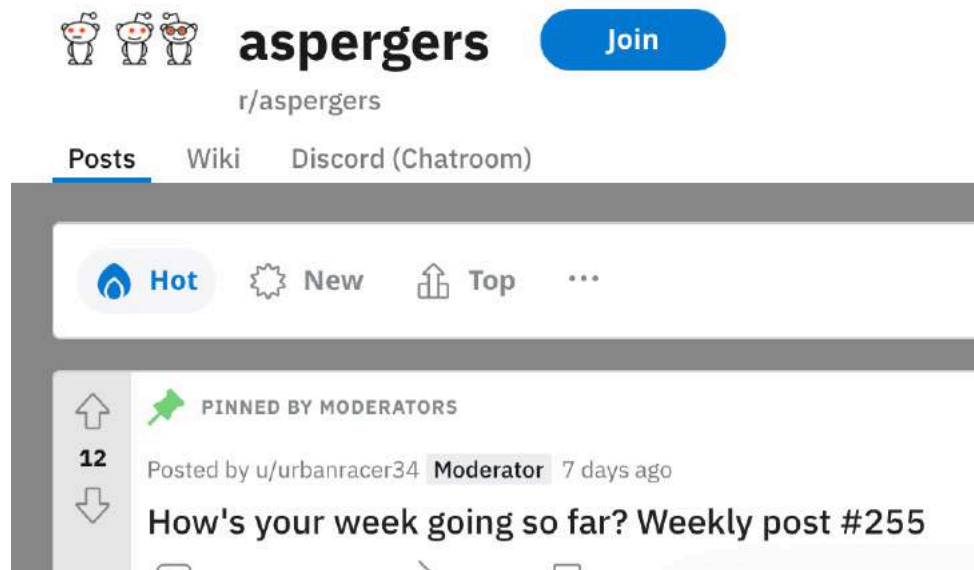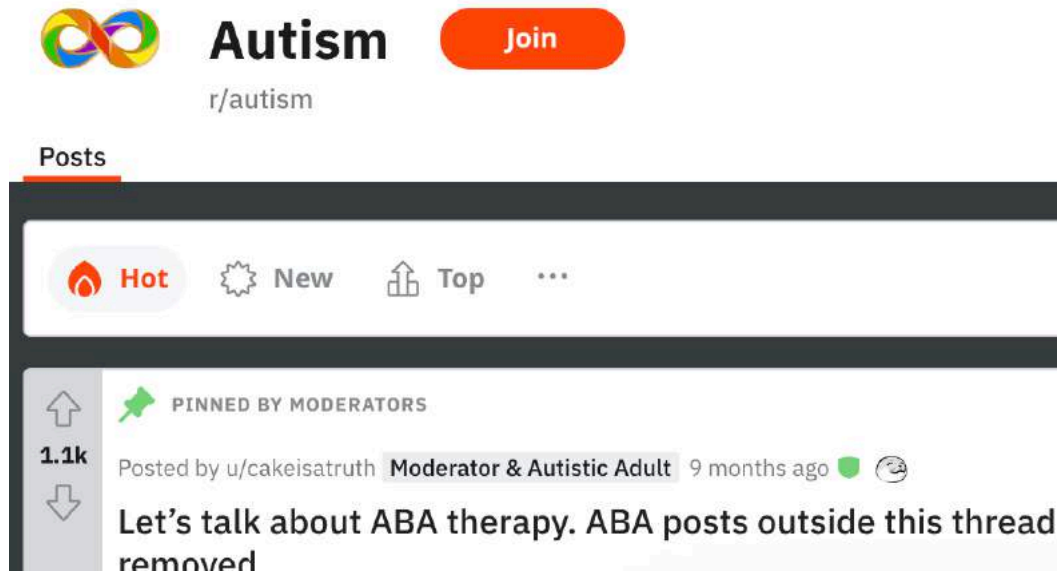| |
| --- |
| **M**ellow |
| **U**npretentious |
| **S**ophisticated |
| **I**ntense |
| **C**ontemporary |

🟥 Indians 🟦 US

Music, Social Media and Autism

Mellow

Unpretentious

Sophisticated

Intense

Contemporary

Indians   US

Music, Social Media and Autism

Metal Hip-hop Pop
Alternative Country
Folk Reggae
Blues Rock R&B
Jazz
Opera
Musical Classical
Funk Electronic

Isolation and Loneliness
Love and Connection
Emotional Turmoil and Conflicts
Positive Self-Image and Acceptance
Self-Reflection and Identity
Joy and Celebration
Struggles and Hardships
Desire for Change and Freedom
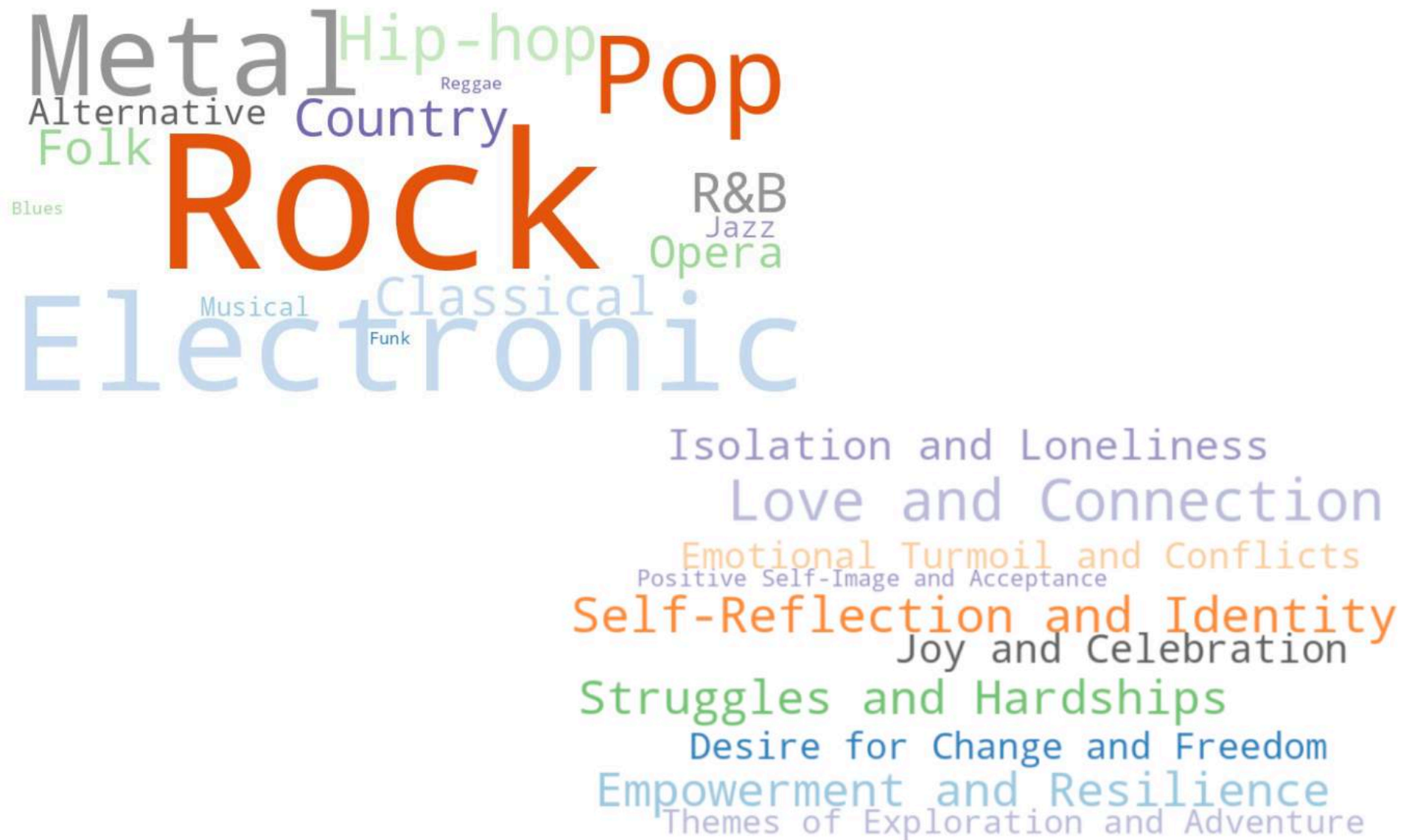Empowerment and Resilience
Themes of Exploration and Adventure

Fig. 4. Lyric Themes of songs based on no. of occurences wherein Love and Connection has the highest number of 52 and Themes of Exploration and Adventure and "Positive Self-Image and Acceptance are 10 each

Varghese, S and Alluri, V (ongoing) **Musical Preferences and Autism**

Intelligence and Music: Lower Intelligent Quotient Is Associated With Higher Use of Music for Experiencing Strong Sensations
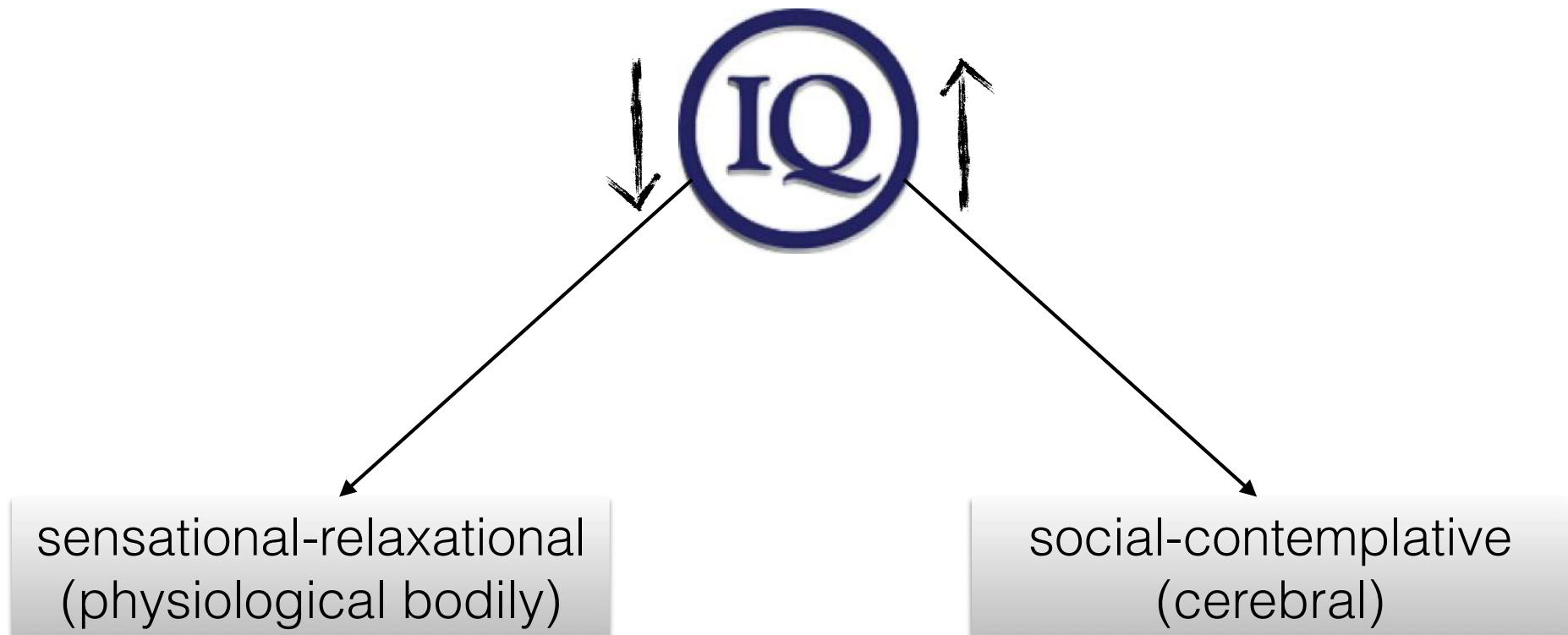
Leonardo Bonetti, Elvira Brattico, Peter Vuust, more...

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https://doi.org/10.1177/0276237420951414

Article information

IQ

sensational-relaxational
(physiological bodily)

social-contemplative
(cerebral)

Saarikallio, S. H., Maksimainen, J. P., & Randall, W. M. (2019). Relaxed and connected: Insights into the emotional-motivational constituents of musical pleasure. Psychology of Music, 47(5), 644–662. https://doi.org/10.1177/0305735618778768

Case Study: Appreciation of Complex Music in a Cognitively Impaired Subject

Muhammed Yaseen Harris, Dr. Vinoo Alluri

Background

- Typically enjoyment of "reflective and complex" music has been associated with individuals with:
    - higher intelligence[1,2]
    - musical training[3]
- Complex music: defined in light of previous studies that characterize it as intelligent and reflective typical of genres such as classical and jazz[5,6]
- However, Bonetti et al. (2020)[4] argue that less intelligent individuals are more likely to use music for experiencing strong sensations

Aims

To provide supporting evidence correlating low intelligence and sensory-motor appreciation for complex music via a case study of Ms. X, an individual diagnosed with congenital cerebral atrophy and severe mental retardation

Methods

- semi-structured interviews (~ 1 hour) of primary caregivers
- questions related to
    - general cognitive functioning and extent of cognitive impairment
    - describe experiences with the subject and response to music throughout her life
    - nature of music played for her and responses elicited thereof
    - responses to other stimuli
- thematic analysis of interview responses

Patient Background

- Cerebral atrophy observed at age of 6 months which progressed until the age of 15 years
- Diagnosed with Severe Mental Retardation and generalized cortical atrophy with normal cerebellum and brainstem

Results

Cognitive Functioning and Impairment
- significant cognitive impairments with minimal responsiveness to sensory stimuli
- observable responses to auditory and tactile stimuli only, especially to those gentle and tender in nature
- auditory spatial perception
- nearsightedness

Response to Music
When in distress, music had a uniquely significant soothing effect, eliciting responses from the subject including:
- pause in crying
- stillness as if paying attention
- changes in facial expression, smiling
- head swaying
- basic vocal responses

Types of Music
- Subject responded best to:
    - Indian classical music (Shivkumar Sharma's santoor compositions)
    - Western classical music (ex: Beethoven's Fur Elise, Mozart's piano concertos, chamber music) typically characterized by slower tempi and bright timbres (ex: keys, xylophone)
    - Jazz music (Fausto Papetti)
- She also responded specifically to bright environmental sounds like:
    - jangling of key chains, utensils, anklets
    - children's voices.
- No pronounced responses were elicited for:
    - generic pop, rock, country music (ex: Tracy Chapman, Neil Diamond)
    - non-bright percussive music (ex: Zakir Hussein)

Brain Scans at Age 15
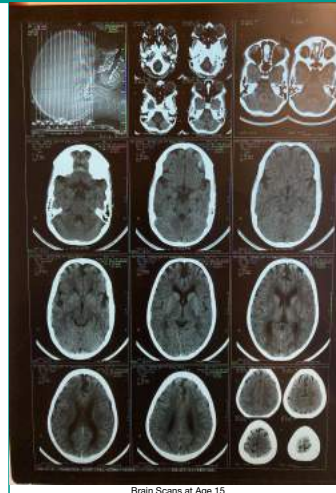
Conclusion

- We provide evidence of an individual with compromised cognitive abilities exhibiting basic sensorimotor responses and positive affective reactions particularly to "complex" instrumental music when compared to mainstream
- This further bolsters Bonetti's claim that intelligence modulates the use of music for experiencing strong sensations, particularly that they are inversely correlated
- This result is particularly interesting in light of Saarikallio et al.(2019)[7]'s proposition of two underlying emotional motivational dimensions to enjoying music, namely relaxation-sensational, a more low-level physiological response that Ms. X demonstrated, versus the social-contemplative, a more cerebral affair and associated with high IQ

Limitations

- Recall bias due to the time between observation and interviews
- Assigning "complexity" to entire genres, is fraught with issues of class, race, and status. Nevertheless, we base it on accepted norms of existing studies[5,6]

References

1. Kanazawa et al., S., & Perina, K. (2011). Why More Intelligent Individuals Like Classical Music. Journal of Behavioral Decision Making, 25(3), 264-275. doi:10.1002/bdm.730
2. Račevska et al., E., & Tadinac, M. (2019). Intelligence, music preferences, and uses of music from the perspective of evolutionary psychology. Evolutionary Behavioral Sciences, 13(2), 101-110. doi:10.1037/ebs0000124
3. North, A. C., & Hargreaves, D. J. (2010). The social and applied psychology of music. Oxford University Press.
4. Bonetti, L., Brattico, E., Vuust, P., Kliuchko, M., & Saarikallio, S. (2020). Intelligence and Music: Lower Intelligent Quotient Is Associated With Higher Use of Music for Experiencing Strong Sensations. Empirical Studies of the Arts. doi:10.1177/0276237420951414
5. Rentfrow, P. J., Goldberg, L. R., & Levitin, D. J. (2011). The structure of musical preferences: A five-factor model. Journal of Personality and Social Psychology, 100(6), 1139–1157. doi:10.1037/a0022406
6. Rentfrow, P. J., & Gosling, S. D. (2003). The do re mi's of everyday life: The structure and personality correlates of music preferences. Journal of Personality and Social Psychology, 84(6), 1236–1256. https://doi.org/10.1037/0022-3514.84.6.1236
7. Saarikallio, S. H., Maksimainen, J. P., & Randall, W. M. (2019). Relaxed and connected: Insights into the emotional-motivational constituents of musical pleasure. Psychology of Music, 47(5), 644–662. https://doi.org/10.1177/0305735618778768

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Connectivity and diversity in music cognition.
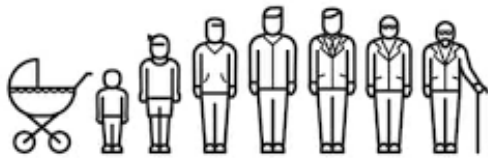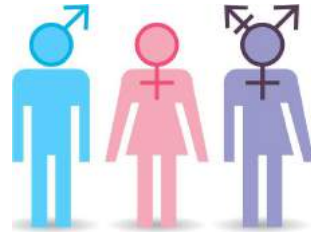
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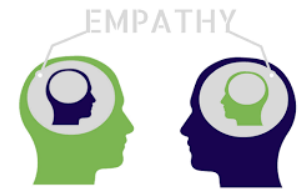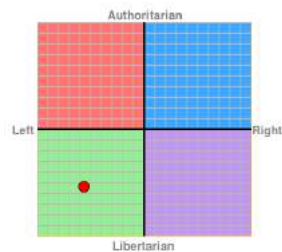# Individual Differences

age

gender

traits

skills

states/arousal level

cognitive styles

political leanings

disease/brain disorders

# Individual Traits, States & Well-Being

- **neuroticism** related to risk of depression (Paulus et al., 2016)

- rumination on cause of sadness associated with more symptoms of depression and anxiety (Roelofs et al., 2008)

- higher musical engagement for emotion focused-coping especially during periods of depression (Stewart et al., 2019; Miranda et al., 2012)

Individual Traits, States & Well-Being
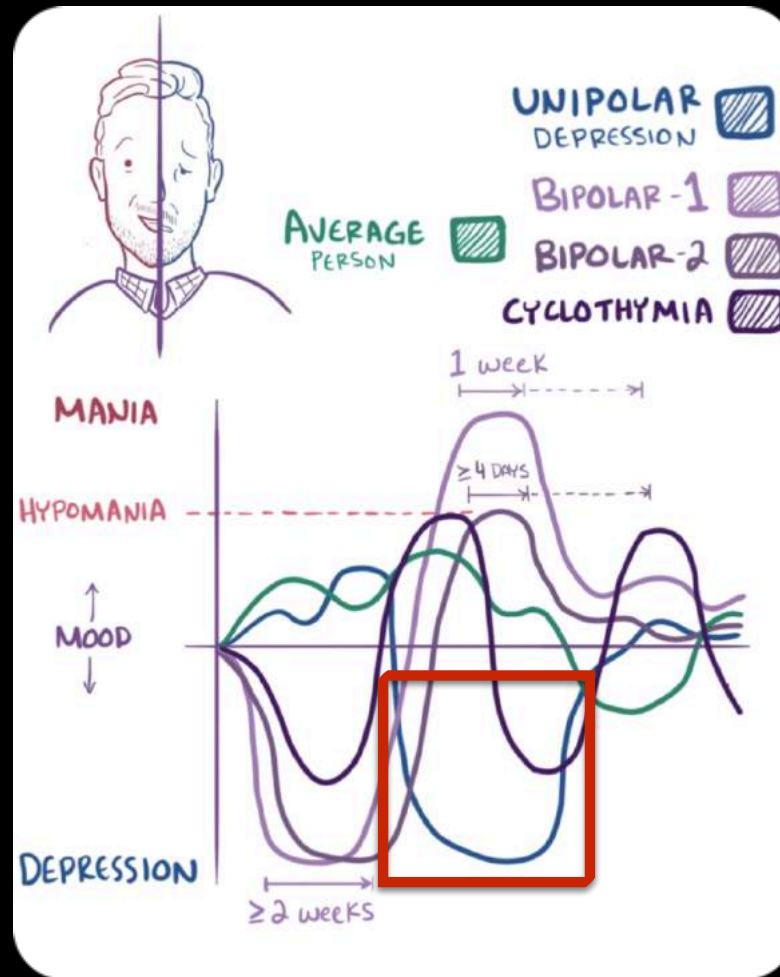
Individual Traits, States & Well-Being

- high emotional variability and emotional inertia are indicators of ill-being and forms of psychopathology such as depression, bipolar disorder, and borderline personality disorder (Kuppens, 2017)
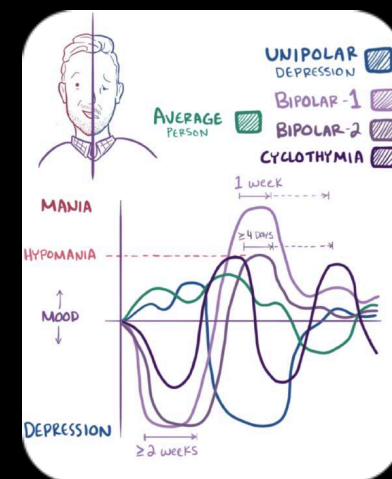
Musical Preferences & Depression

"people with a tendency for depression demonstrate a liking for sad music"

Garrido, S and Schubert, E (2015). Music and people with tendencies of depression. Music Perception, 32, 4, pp. 313–321,

why?

induce consolation (Huron, 2011)

safe place/space to accept sadness (Van Den Told et al, 2016)
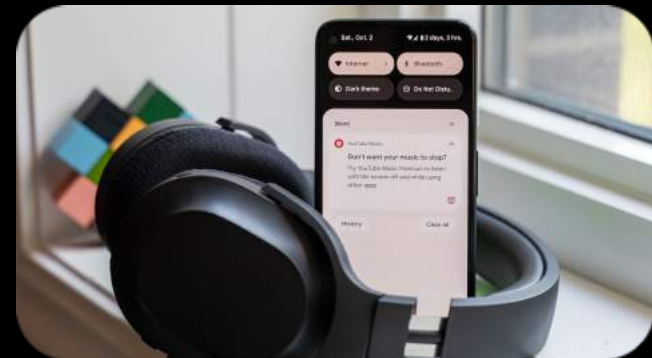
Musical Preferences & Depression

"people with a tendency for depression demonstrate a liking for sad music"

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depression group chose
- more sad and less happy music excerpts
- chose less energetic music excerpts
- "sad music is calming"

Yoon, S., & Rottenberg, J. (2021). Listening to the blues: An ecological momentary assessment of music choice in depression. Emotion, 21(6), 1177.

Musical Preferences & Depression

"people with a tendency for depression demonstrate a liking for sad music"

Garrido, S and Schubert, E (2015). Music and people with tendencies of depression. Music Perception, 32, 4, pp. 313–321,

HEALTHY-UNHEALTHY MUSIC SCALE

"an instrument to detect a risk for depression and potentially other mental health problems in a nonintrusive way"

Saarikallio S, Gold C, Mcferran K. 2015. Development and validation of the Healthy-Unhealthy Music Scale. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

Saarikallio S, Gold C, Mcferran K. 2015. **Development and validation of the Healthy-Unhealthy Music Scale**. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

Kessler Psychological Distress Scale (K10)

Mental Wellbeing

Saarikallio S, Gold C, Mcferran K. 2015. **Development and validation of the Healthy-Unhealthy Music Scale**. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

		Never	Rarely	Some-times	Often	Always
1.	When I listen to music I get stuck in bad memories	☐	☐	☐	☐	☐
2.	I hide in my music because nobody understands me, and it blocks people out	☐	☐	☐	☐	☐
3.	Music helps me to relax	☐	☐	☐	☐	☐
4.	When I try to use music to feel better I actually end up feeling worse	☐	☐	☐	☐	☐
5.	I feel happier after playing or listening to music	☐	☐	☐	☐	☐
6.	Music gives me the energy to get going	☐	☐	☐	☐	☐
7.	I like to listen to songs over and over even though it makes me feel worse	☐	☐	☐	☐	☐
8.	Music makes me feel bad about who I am	☐	☐	☐	☐	☐
9.	Music helps me to connect with other people who are like me	☐	☐	☐	☐	☐
10.	Music gives me an excuse not to face up to the real world	☐	☐	☐	☐	☐
11.	It can be hard to stop listening to music that connects me to bad memories	☐	☐	☐	☐	☐
12.	Music leads me to do things I shouldn't do	☐	☐	☐	☐	☐
13.	When I'm feeling tense or tired in my body music helps me to relax	☐	☐	☐	☐	☐

Healthy-Unhealthy Music Scale

"Music helps me relax"

"I feel happier after playing or listening to music"

"Music helps me connect with other people who are like me"

Saarikallio S, Gold C, Mcferran K. 2015. **Development and validation of the Healthy-Unhealthy Music Scale**. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

"I hide in my music because nobody understands me, and it blocks people out"

avoidance

rumination

"I like to listen to songs over and over even though it makes me feel worse"

"It can be hard to stop listening to music that connects me to bad memories"

Saarikallio S, Gold C, Mcferran K. 2015. **Development and validation of the Healthy-Unhealthy Music Scale**. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

Unhealthy Score

Kessler Psychological Distress Scale (K10)

Mental Wellbeing

Saarikallio S, Gold C, Mcferran K. 2015. **Development and validation of the Healthy-Unhealthy Music Scale**. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

"HUMS is **not a direct measure of depression** but ……

……an instrument to detect **a risk for depression** and potentially other mental health problems in a **nonintrusive** way."

"a **high HUMS Unhealthy score** could be followed up with a screening measure for **depression and suicide risk**."

Saarikallio S, Gold C, Mcferran K. 2015. **Development and validation of the Healthy-Unhealthy Music Scale**. Child Adolesc Ment Health. 20:210–217.

Healthy-Unhealthy Music Scale

n = 141

(mean age = 24.32, sd = 3.83 years, 80 males)

Subramaniam, S., Mittal, A., Alluri, V. (2018). **Indian Validation of Healthy-Unhealthy Music Scale (HUMS)** . International Conference on Music Perception and Cognition. Poster.

Healthy-Unhealthy Music Scale

n = 151

(mean age = 29.3, sd = 6.7 years, 91 males)
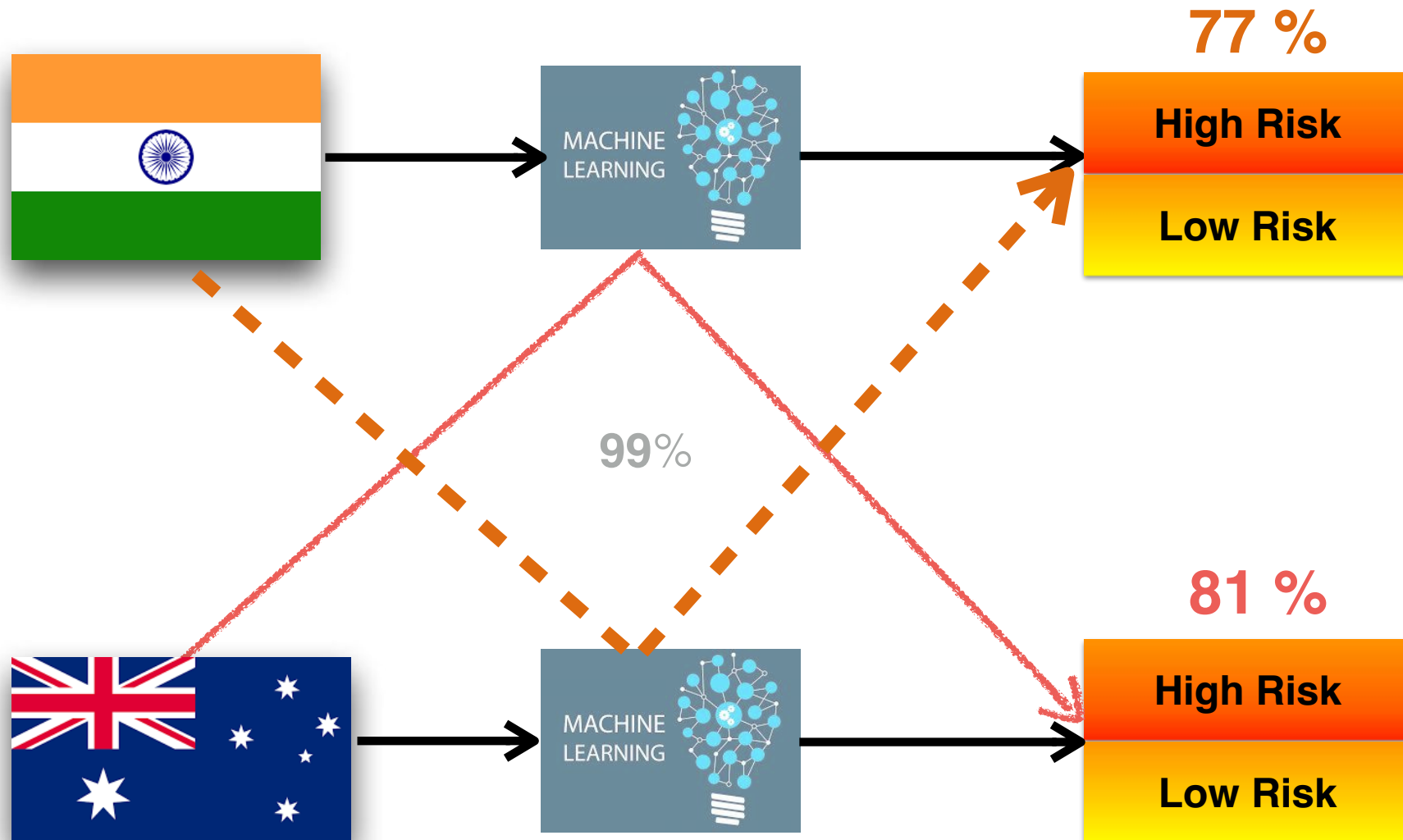
Healthy-Unhealthy Music Scale

Scales	Original Study		Current Study	
	Healthy	Unhealthy	Healthy	Unhealthy
Healthy	1		1	
Unhealthy	0.14*	1	0.21*	1
K10	0.18**	0.67**	0.01	0.54**
MHCSF	0.09	-0.48**	0.18*	-0.22*
Rumination	0.21**	0.50**	-0.06*	0.44**
Reflection	0.24**	0.01	0.01	0.03

*p < .05; **p < .01

Partial correlations (controlling gender) between various scales

Predicting Risk from Listening Strategies

Agarwal, R., Singh, R., Saarikallio, S., McFerran, K, and Alluri, V. (2019). Mining Mental States using Music Associations. In Speech, Music, and Mind with Audio Satellite Workshop, Interspeech 2019.

Healthy-Unhealthy Music Scale

n = 65

(mean age = 27, sd = 8.3 years, 35 males)

n = 285

(mean age = 29, sd = 9.8 years, 136 males)

Mittal. et al. (under review). **Assessing the validity of the Healthy-Unhealthy Music Scale in clinically depressed individuals in India.** International Conference on Music Perception and Cognition.

Healthy-Unhealthy Music Scale

Kessler Psychological Distress Scale (K10)

Unhealthy Score

Unhealthy Score

$r = $ **0.17**

$r = $ **-0.17**   *Healthy* and *Unhealthy* $r = $ **0.23**

What do your music habits reveal about your current mental state?

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What kinds of **personality traits** (including **empathic** and **emotional** traits) best predict unhealthy and healthy relationships music listening strategies?

Healthy-Unhealthy Music Scale

Emotional Contagion

OPENNESS   CONSCIENTIOUSNESS

THE BIG FIVE

NEUROTICISM   EXTRAVERSION

AGREEABLENESS
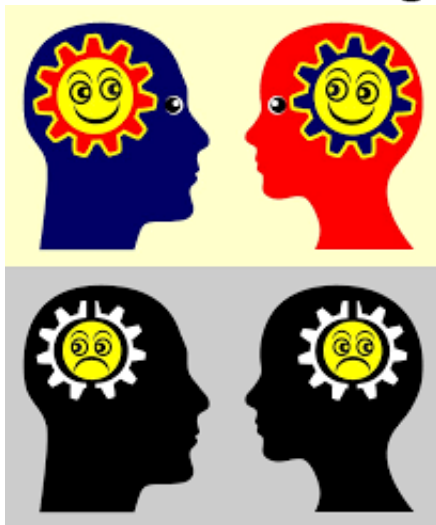
n = 318

mean = 32 years, sd = 12.45

138 males

Empathy

REWARD

"I know exactly how you feel."
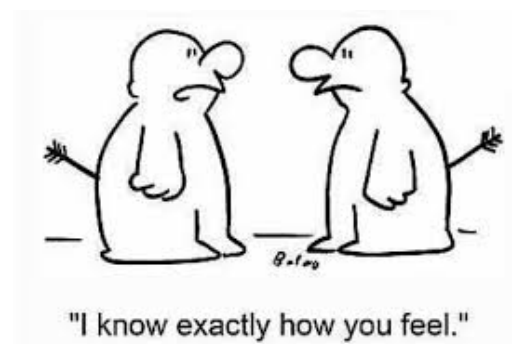
Mittal, A., Vuoskoski, J., Alluri, V. (2018). **Personality, trait empathy, and kinds of musical reward predict healthy and unhealthy music listening strategies.** International Conference on Music Perception and Cognition. Poster.

"When I hear a tune I like a lot I can't help tapping or moving to its beat"

"I like to listen music that contains emotion"

REWARD

"Music calms, relaxes & comforts me"

NEW MUSIC

"I'm always looking for new music"

"When I share music with someone I feel a special connection with that person"

Mas-Herrero E, Marco-Pallares J, Lorenzo-Seva U, Zatorre RJ, Rodriguez-Fornells A. 2013. **Individual Differences in Music Reward Experiences**. Music Percept. 31:118–138.

Unhealthy Score

Healthy Score

HUMS
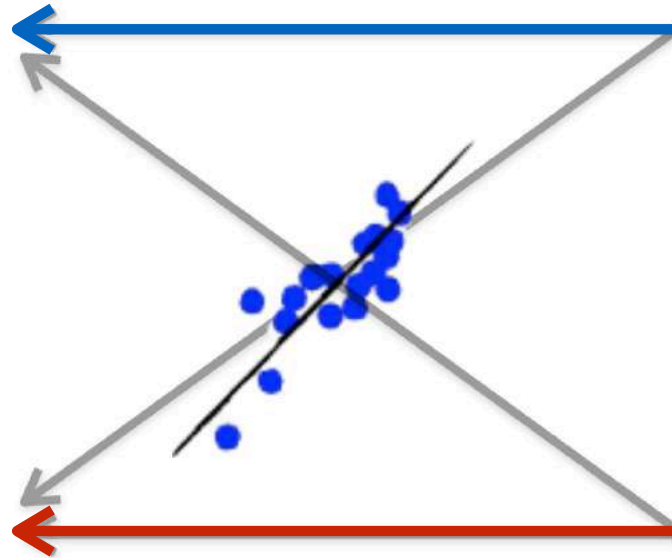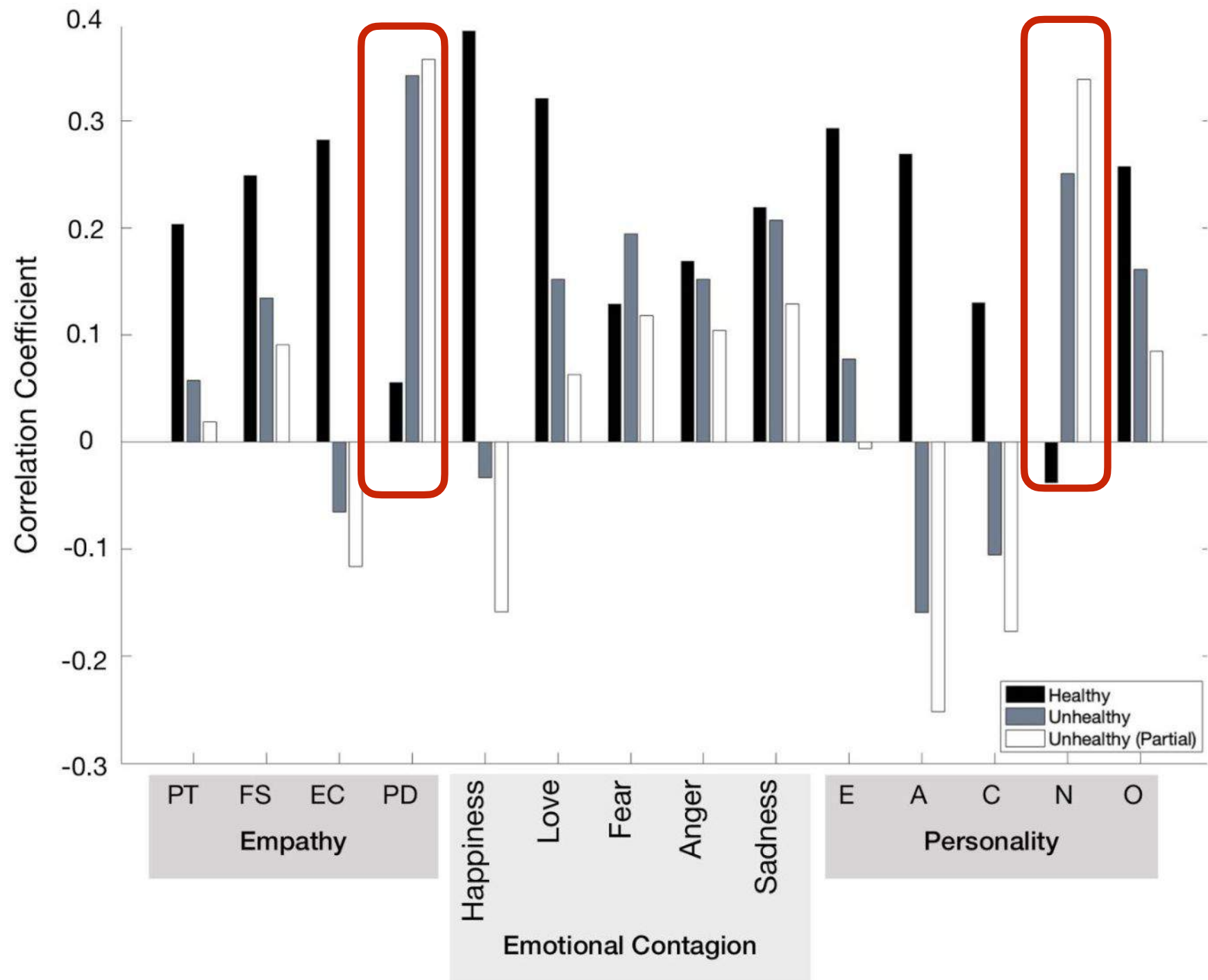
REWARD
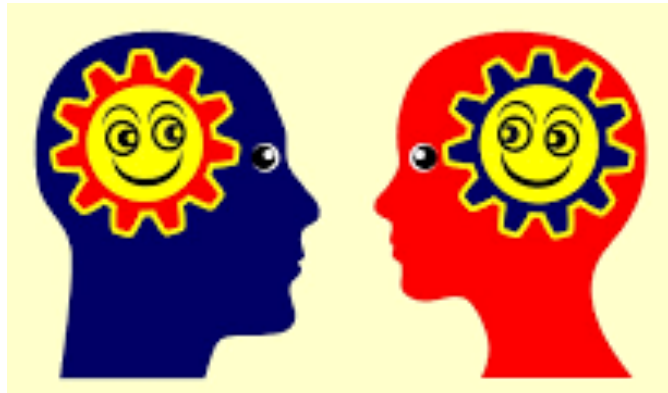
Healthy	Unhealthy

music reward: mood regulation, musical seeking, social reward
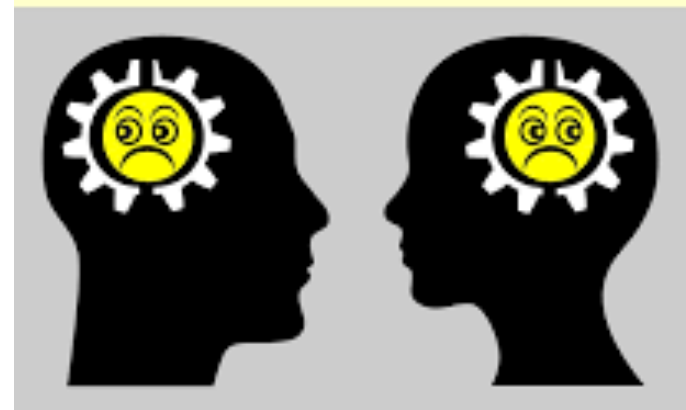
music reward: emotion evocation, low sensory-motor
traits: catch "**negative**" emotions (sadness, fear), empathy (high personal distress & perspective taking, low empathic concern), high extraversion
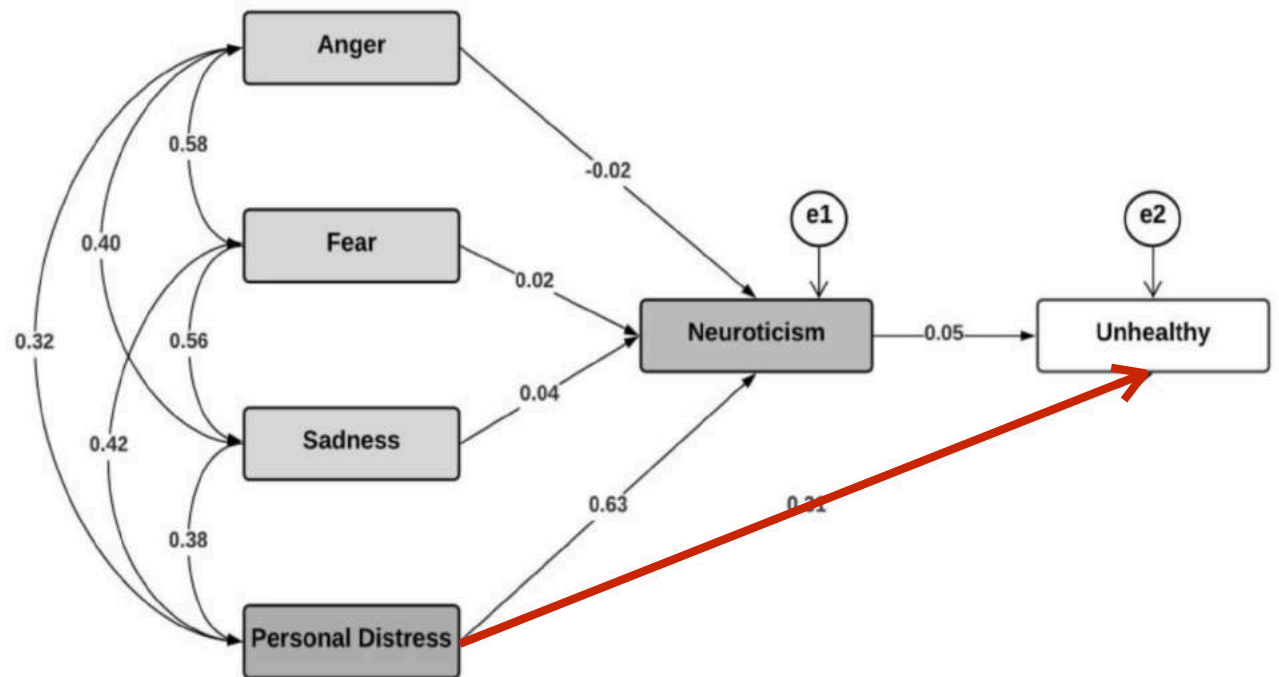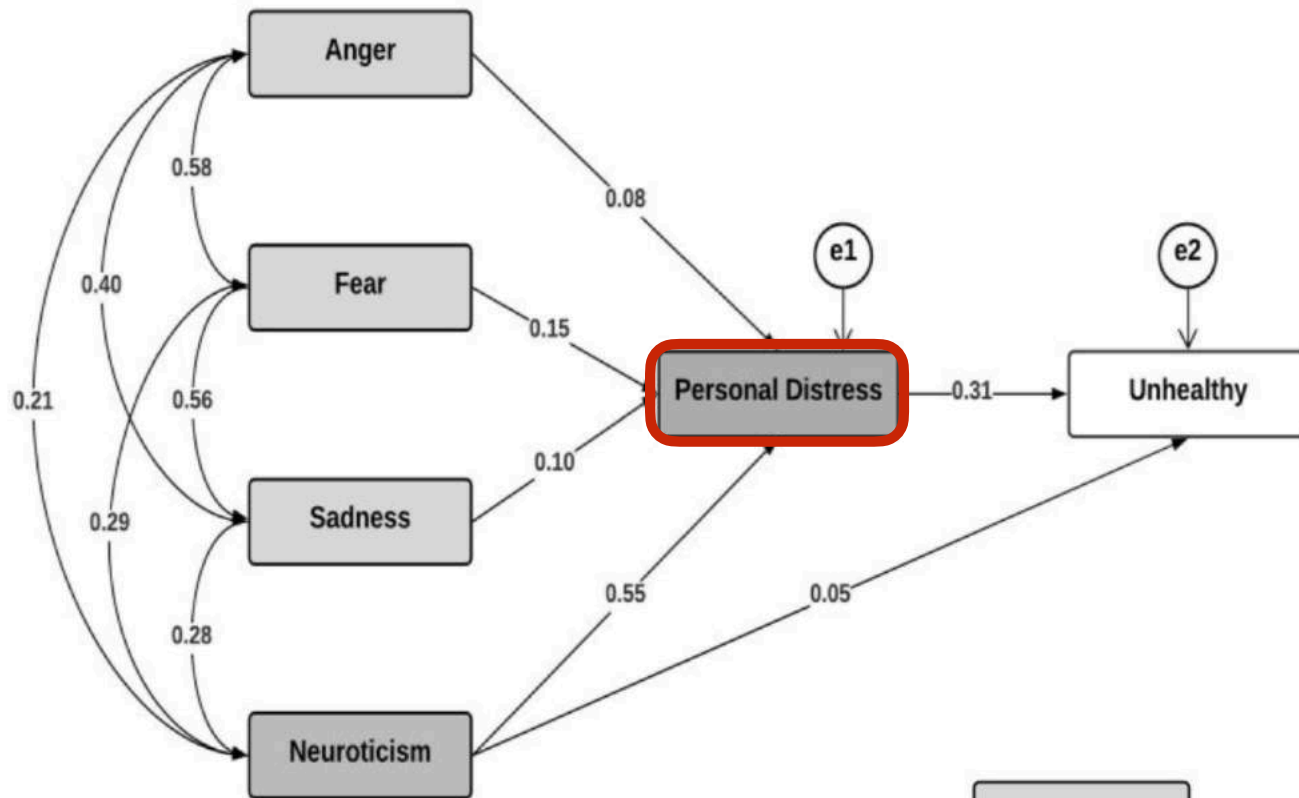
Structural equation modelling
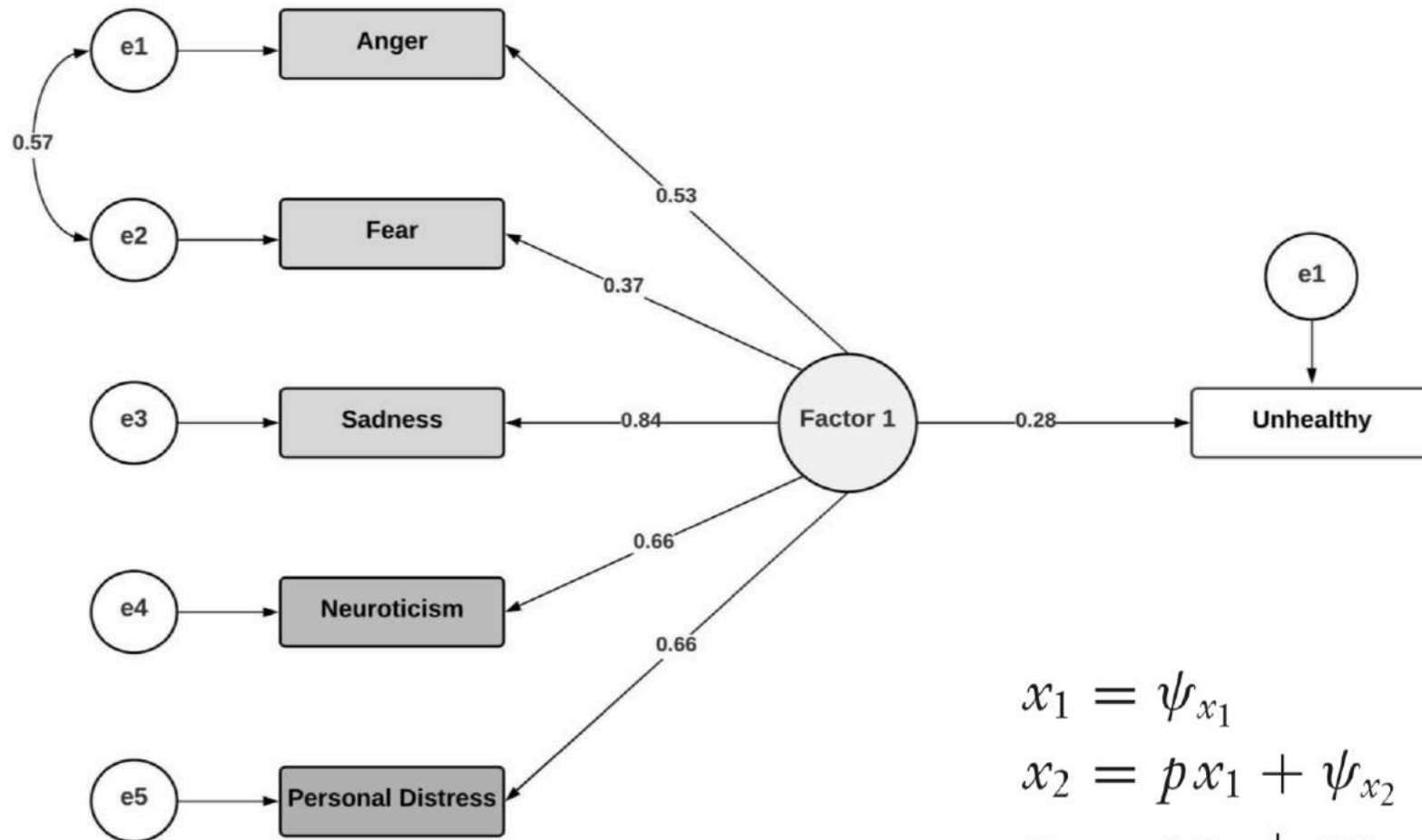
$$x_1 = \psi_{x_1}$$
$$x_2 = p x_1 + \psi_{x_2}$$
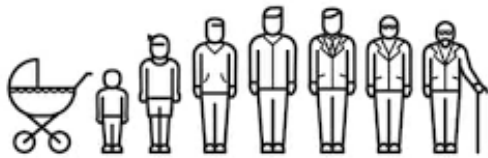$$x_3 = q x_1 + r x_2 + \psi_{x_3}$$
$$x_4 = s x_2 + t x_3 + \psi_{x_4}.$$

Conclusions

"….**unhealthy** listening strategies associated with **sensitivity to negative emotions** suggesting **dysfunctional regulation of negative emotions** and hence proneness to depression"
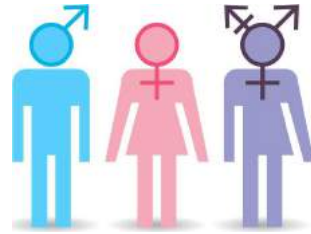
" …. importance of the empathic trait **Personal Distress** in mediating Unhealthy musical engagement "

"maladaptive" or "adaptive" strategies for such individuals aiding to combat depressive and anxious states thereby preventing them from "tipping over" into depression?"
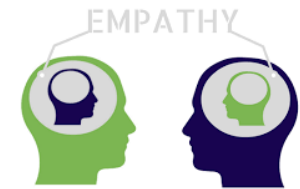
Alluri, V. et al. (2022). **Maladaptive music listening strategies are modulated by individual traits.** Psychology of Music

Individual Differences

age

gender

traits
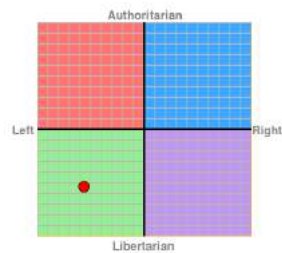
skills

states/arousal level

cognitive styles

political leanings

disease/brain disorders

Musical Expertise/Ability and Music Preferences

• musicians vs non-musicians?

• amateur vs professional vs sleeping musicians?

• genre associations?

• how well can preferences determine musical abilities?