

Music Psychology Notes

Lecture 1

History

First work associated with music psychology was by **Helmholtz (1863)** and concerned sensory perception of tones on human physiology. Scientific.

Carl Seashore “father of music psychology” (1919).

- first objective test of musical aptitude (natural ability to do something).
- test involved observing if a person could determine differences or similarities in pitch, timbre, duration and rhythmic patterns.
- aimed to be scientific to avoid bias.
- more about acoustical acuity than the complex nature of musical abilities.

1920's-30's

- focus shift from psychology of tone to psychology of music.
- speech is only sequential info. Music is sequential and simultaneous.
- music can evoke affective responses (emotions, moods).

Physiological data as well as affective was recorded. Physiological responses of autonomic NS, heart rate, BP, GSR.

Leonard Meyer (1950)

- suspense in music evokes arousal
- ^ arousal = ^ emotional response
- accounting for the differences between peoples response to the same music

We don't all respond in the same way to the same music.

Music has 'floating intentionality' = the ability to have various meanings in various contexts. 'Shared intentionality' = music's power of entrainment (eg. Italian tuna fishing song to help coordinate raising the net).

Reading 1 – Music, the food of neuroscience?

- Listening to/producing music uses practically every human cognitive function.
- humming a familiar tune, necessitates complex auditory pattern-processing mechanisms, attention, memory storage and retrieval, motor programming, sensory-motor integration, and so forth.
- Lesions of certain auditory cortical regions result in a highly selective problem with perceiving and interpreting music.
- These people can speak and understand words but cannot notice wrong notes inserted into tunes or recognise melodies.

- **Amusia = tone deafness.** The inability to recognize musical tones or to reproduce them.
- music and speech processing do not use completely overlapping neural substrates.
- some functions, such as syntax, may require common neural resources for both speech and music
- music processes thought to be primarily in right hemisphere
- ability to perceive music comes early.
- Training in music enhances activity of certain neural systems: motor cortex
- Degree of change depends on age of child in training (more in childhood)
- Cultural and social factors have roles in our emotional response to music

Lecture 2

- Auditory processing
- Musical processing
- Music and language processing – distinct and overlapping processes
- Music neuroplasticity

Principles of Auditory processing

Sensation – sensori- neural encoding incoming stimuli from your environment

Perception – transforming and interpreting sensory information to construct meaningful percepts

Higher level cognition – representation of goals

Broad framework

Bottom up – basic to complex

Top down – higher level to basic levels

Ear – pitch, loudness, timing, complex patterns

Translates vibration of air into nerve impulses; vibration of fluid detected by nerve cells; sent for deeper processing

Auditory processing is what happens in the brain when it **recognises, interprets and can respond** to the varied sounds around us such as music, language and the environment in which we live

Extensive binaural interaction (from both ears)

Info from cochlea is sent to cochlea nucleus

Pathway: cochlea → brainstem → cortex

Superior Olivary Complex – first place where info from left and right ear converges onto single neurons. Locates sound sources

medial – time differences/ lateral: intensity differences

Medial geniculate – relay station to cortex.

Auditory info processed in cortex.

Wernicke – comprehension and understanding of language

Primary auditory cortex – temporal lobe

Gets info from thalamus

Tonotopic representation (pitch)

Secondary and auditory association cortex – no tonotopic representation
streams sound sequences (language, melodies)

Music is bilateral

Listening to unfamiliar music – temporal cortical activations associated with the perceptual and cognitive representations of music

Activation in – primary auditory cortex, auditory association cortex, superior temporal sulcus, right middle temporal gyrus and right superior temporal pole

Paralimbic and limbic systems also activated (emotions)

Right auditory cortex is sensitive to small pitch changes relative to the left.

Music and memory – why do we remember every word from a song but can't remember where we went yesterday?

Right regions – perceptive melodic traces of familiar tunes

left regions – access to semantic attributes and associative memories

Memory

Some overlap in music semantic memory and verb semantic memory

Semantic memory – recognise it, know how it goes, know who sings it

Episodic memory – an association between a personal event at a specific time, event and emotional context

a unique personal episode – “theyre playing our song”

Located in mesial temporal lobe.