

## Music is a

### Broadcast

- ▶ Sound is an open-ended transmission medium, difficult to confine or occlude within the range of audibility (Forrest, 1994).
- ▶ Broadcast signals attract attention, good and bad.
- ▶ **This medium makes music inherently social**, a phenomenon deliberately shared rather than a stimulus to be experience privately.
- ▶ Subsonic vibrations (seismic signals) can similarly be interpreted musically, and they are also as broadcast. (e.g., the Muse Seek Project, Battle 2015)

### What is heard as music? What is afforded by musical hearing?

- ▶ Auditory streams recognized as musical are evaluated using criteria distinct from other sound sequences, including speech (ex: Mantell & Pfordresher, 2013).
- ▶ Sounds **not intended** to be heard as musical can be heard as such, ex: construction noise.
- ▶ Some people report voluntarily engaging musical hearing of any soundscape.

**Proposal: According to our ears, music is a broadcast signal enabling sustained concurrent action.**

### Signal

- ▶ Music is a signal: information communicated from a sender to a receiver through some medium of transmission (Smith, 1965).
- ▶ At minimum, a musical signal indicates the proximity of another human being, one willingly broadcasting their presence.
- ▶ Music also conveys information about the sender's :
  - emotional state , cultural identity, intention to engage and influence a receiver.
- ▶ Music uses the physical properties of sound, parametrized in service of communication.

### Enabling

- ▶ Components of music perception are involuntary (ex: metrical entrainment, key identification.)
- ▶ A musical signal constrains but does not determine how a listener will respond or engage with it.
- ▶ Music allows for concurrent action, but it does not compel a listener to move or make sound.
- ▶ Responses and concurrent actions may be scaled down (simplified, less effortful), poorly executed, or even subversive.
- ▶ Some behaviours may only be possible when musical hearing is active.

#### Add your thoughts?

This theory is a work in progress. You are welcome to share examples and arguments for or against it.  
Please jot down your comment on a post-it and place it on the poster where-ever it best relates to the printed content. And if you would like your contribution to be acknowledged in future interactions of this theory, please include your name.

#### Is it Music?

This definition includes some activities which may not be widely considered as musical, whether or not they are perceived in such a fashion as to support sustained concurrent action. A few examples are:

- Marching
- Chanting
- Meditative humming

Depending how how some of these terms are interpreted, some sounds that we hear as musical are really tricks of the mind. To hear bird song as musical is easy, given its organisation, but it is not a signal intended to induce concurrent action in us humans.

#### Music vs Language

Despite similarities in the source and some signal qualities:

- ▶ Language does not support sustained concurrent action.
- ▶ Music is much more resilient to intermittent attention.
- ▶ Music does not efficiently transmit ideas.

How might these differences in perceptual opportunities be evaluated?

### Attention Divided

- ▶ It is difficult to act and listen at the same time, practiced motions and predictable signals make it easier.
- ▶ Music often shared during repetitive, mundane activities, adding cognitive stimulation
- ▶ Some listen to music during cognitively demanding tasks, like writing, adding predictability and continuation.
- ▶ Signal resilience and accuracy expectations support many degrees of attentiveness to music heard.
- ▶ Music has been and still is a common accompaniment to other tasks, both repetitive and mundane activities such as factory work, and cognitively and creatively demanding activities such as writing.

### Familiarity

- ▶ Well know interaction between familiarity and enjoyment: too novel and too repetitive are boring.
- ▶ Knowing a piece: more practice doing with the music, confidence in participation
- ▶ Boring music can be interesting with learning to options of doing.
- ▶ Repetition supports play, provides a solid ground for testing options of doing.
- ▶ Practiced doing allows for more confident more expressive action, thus deeper engagement and affective response
- ▶ Personality differences?
  - enjoyment to new music and tolerance of ambiguity (openness)
  - frustration with new music and perfectionism (can't act well)

### Sufficiently Competent to Play

- ▶ The same music can be enjoyed by untrained listeners and highly trained musicians.
- ▶ Music often experience in crowds of mixed competencies, each participating as they are able and willing.
- ▶ Individuals evaluate action opportunities to music with respect to their own capacity:
  - tone deaf singers can enjoy singing
  - uncoordinated babies can enjoy moving with music
- ▶ Actions associated with music change with practice (Zatorre, et al., 2007)
- ▶ hard music becomes interesting as we learn how to act with it.

### Performed Arousal

- ▶ Listeners find it easy to evaluate relative arousal levels between and within pieces of music.
  - Perhaps music is then conveying intensity of action, the performer's **apparent** effort.
- ▶ If music express a target arousal level, it can encourage hearers to act with the same degree of calm or gusto.
  - Hearers can control how and whether to move towards this target.
- ▶ Judging effort and intensity in social context:
  - Embarrassment at dancing with too much or too little enthusiasm.
  - The problem of music at the wrong intensity for the context.
  - Is turing it down (up) enough?

### Expectation

- ▶ What are the rewards of expectation: guessing right (Huron, 2006) or doing well?
    - Identifying actions which **do not** fit the musical signal seems to be easy.
    - Identifying which actions fit **best** with a musical signal seems to be hard.
- However well we know what does happen in, for example, a recording of music, we never stop considering what could happen.

## Concurrent

- ▶ Musical signals can support unison action, strict synchrony between many people.
- ▶ Musical signals can also support distinct action sequences perceived as coordinated, fit and ill-fit.
- ▶ Concurrent actions to music may also produce musical signals.
- ▶ Many aspects of actions coordinated with musical signals can be assessed for quality of fit:
  - timing, tuning, timbre, affect, etc.
- ▶ If broadcast, these assessments may depend on perception though musical listening.

#### Origins of music

- ▶ This definition is compatible with theories of entrainment for social bonding through synchronised action (ex: Fitch, 2012).
- ▶ Music may practice shared intentions, the We perspective (Tylan et al., 2012), through bodily coordination.
- ▶ In this frame, music motivated by desire to act together.
  - limitation necessary for learning to behave musically, but not sufficient.
- ▶ The power of coordinated action may be an important motivator for musical activity: intimidating to the outsider (drums of war), empowering for the participants.

## Sustained

- ▶ Musical signals are expected to continue until specific cues are employed to indicate an ending.
- ▶ Unlike other broadcast signals, there is no apparent pressure to transmit information faster.
- ▶ Activities involving sustained attention are costly. Many are justified by their benefits (eating, sleeping, etc. )

## Action

- ▶ The essential claim of this theory is that our perception of music is principally to support concurrent action.
- ▶ **We hear music so as to know how to act with it and, correspondingly, with the persons generating the signal.**
- ▶ Accurate perception of the signal heard, inference of meaning, and memorisation are of secondary importance.
- ▶ Is this testable? Action and imagined action is measurably different from observation and imagined observation (Tian & Poeppel, 2013).

#### Music without meter

Concurrent action is possible without obvious metrical regularity, so long as the listener has some sense of what to do with what they hear.

- ▶ Ex: open improvisation, in which performers listen and act according to less familiar (and less formalised) criteria.
- ▶ How do we act with soundscape music?

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