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ISE 575b  
Music Cognition

## Week 2 Reading Summary

This week's paper by Alf Gabrielsson goes thru empirical research regarding mainly western tonal music and art music. It is important to understand that this does not refer to singular notes, chords, music without context. The material is organized in a chronological order (planning of performance, the performance itself, factors that may influence the performance and evaluation of the performance).

Performance planning is broken down into 2 parts— a genuine understanding of what the music is about, and a mastery of techniques involved with playing the instrument. Simple survey of famous pianist shows the latter is obviously true, so this leaves a lot of focus on the first point. In skilled performers, the most important aspect is in the interpretation—to have clear understanding of what the music stands for and being able to feel an objective out.

Preparation differs on many factors; including experience, the instrument used, personality, knowledge, etc. For example, when preparing for a new piece, one will need to start from scratch; although they may be able to retrieve pieces of representations in their mind and reshape those to fit the current piece. Memorized performances are more complete as it is just consist of unzipping pieces in the mind, while improv is incomplete by nature.

An interesting observation by Palmer states that there are more chord errors in homophonic performances versus single note errors in polyphonic performances. In some ways, this conforms to general music theory. Every performance involves some kind of intent and interpretation from performer in form of ideas, memories, body movements, or patterns in the sound. Markings hinder creative interpretation of pieces as evidenced by Shaffer's study of giving pieces to four performers, where one didn't have markings and ended up playing a completely different interpretation.

As much as it is mental, a lot of it is also physical as movements and motor processes define the way the music is played. Examples are especially relevant in African music and rock music where the layout of notes and guitar play a large role in conceptualization of the piece. Truslit says motion is fundamental and therefore must be correct for the music to be played correctly. He re-emphasizes music practice, especially with form. The conclusion is that preparation can come in many forms such as moods, imagery, meaning, motions, etc.

Wicinski studied and interviewed prominent Moscow pianists and found the general pattern to be 3 stages—developing ideas how it should be performed, practicing parts of the technical hand work, and the third stage is a blend of the two where they rehearse and lead to a final version.

Practice is believed to be in two forms—mental and physical. German pianist Leimer believes in mental training. A complete mastery of the mental side before even touching the physical. Must know it so that music is heard through one's mental inner ear. Requires precise technical hand motions.

A Study by Rubin Rabson compared mental learning vs physical learning and found that in a relearning experiment three weeks later, the mental training performers needed less time to play the correct performance by heart, but this advantage was nonexistent when this test was done seven months later. Another study by Ross showed that physical practice was better than mental, but that mental practice was better than no practice at all. Conclusively, the best practice is a blend of physical practice with some mental practice to support. Physical practice more important for complex pieces or less advanced players.

Studies confirm that sight reading is more efficient when the music is known, or if you know what is coming next, and knowing the general style. 5 notes on average is the optimal manageable size. Fast eye, knowing the instrument, fast ability to translate notes to music are characteristics of a good sight reader. McPherson also reported that less skilled a sight reader usually only mistake on rhythm and that more skilled players begin to scan for obstacles, signatures, and phrases. General eye studies show that skilled readers looked further ahead and used the time to interpret expressive markings while less skilled readers spent most of the time fixating every single note and rarely made translations of expressive markings.

There are no relations between good sight reading and good memory. Memory performances store in long term memory, but being one does not mean you are the other also. And being the other does not preclude you from being the other. In relation to music structure, better skilled players tend to notice small mistakes in notes and tend to actually play the correct note anyways as experimented by Sloboda.

Improvisation is no simple matter as any musician can't help but to improvise a little, even in the case of the strictest and most notated musical matters. While hard to define sometimes, Pressing defines it as "an ordered union of event clusters." These clusters are based on previous things that happened, a reference, something in memory, and the current goals of the piece.

Looking at jazz groups, basic idea is constrained by two common restrictions: The structural conventions used in jazz and certain social practices. Social practices include the way a leader decides and controls the song, the style dictated by certain soloists, and other things such as verbal and nonverbal signals that may include hand or eye communication.

In another study, researchers concluded that experts had an overall improv plan, but adopted changes on the fly based on what was going on. Being relaxed, expert

performers also fallback of certain subroutines and cliches while they worried about the overall flow and plan.

Feedback comes in visual, audio, and tactile form. Research has shown how conductors and fellow performers use the combination of the audio and visual feedback to keep each other in sync. In addition research has concluded that delayed auditory feedback has a very detrimental effect in the way a musician receives feedback and plays.

There are four theories to motor skills. The first is a closed-loop theory that believes information produced from movements is sent back to the central nervous system and checked for any discrepancies between the intended and produced effect. This is sometimes scrutinized as some believe this system is too slow for certain musical movements like trills.

An open loop theory postulates that all movements are controlled sequentially and executed without any sense of feedback. Senses may play a role in constructing or modifying the movement a little, but everything is set up and queued centrally.

The schema theory believes that there is an abstract set of rules and classes of motor action that can be put together and drawn together to create a variety of motor movements. In a sense, it believes we have a general set of rules and ways our motor skills operate by and every movement is a combination and execution of these rules.

Finally, the Bernstein approach theorizes that muscles do not work individually, but as small control groups where they come together to form a functional unit. While Bernstein himself did not discuss this in relations to music motion, other researchers have referred to it.

A researcher named LaBerge attempts to develop a composite theory that blends all four of these theories in musical context in 1981.