

## Module 2- Musical Instruments

What are instruments?

**Musical instruments** are any sound producing medium used in the creation of music. This includes the human body (voice) and all electronic and chance production of musical sounds.

Musical instruments are amongst the earliest evidence of humans creating art. The oldest extant instruments are flutes found in Hohle Fels cave in Southwest Germany. These flutes are made out of the leg bone of a swan and woolly mammoth ivory. These flutes reveal musical activity at the end of the “stone” age. Visual representations of musical instruments can be found in most of the World’s ancient cultures (Egyptian sistrum, Persian ney, Chinese xun, Greek “Pan” flutes, aboriginal Australian bullroarer, log drums of the Aztecs, and so on). We also learn about instruments from myths, legends, and in art. Although there is much evidence left of musical instruments there is little information left on how they were played. Because of this ethnomusicologists must make many deductions and assumptions about how music sounded.

Perhaps the first musical instruments were used for communication. **Signaling instruments** are common even today. **Trumpets** and **drums** have a long tradition of signaling in military units both on and off of the battlefield. **Shofars** and **Kudu horns** uphold this same tradition in various older cultures. Gongs and church bells have long signaled many events. In Tibetan Buddhism monks blow into **conch shells** to signal times and call people to prayer. The drum beat of a Turkish Janissary band was used to strike fear into Christian crusaders. Electronic musical tones now signal the arrival of text messages, phone calls, the completion of a download, and any number of achievements on video games. Determining the use of an instrument helps to give insight into the meaning of it to the people who use it.

When looking into the instruments of any culture it is helpful to use a classification system. The most common used classification system for musical instruments (used in Western academia) is called the Hornbostel-Sachs instrument classification system (published in 1914). This system is based off of a Hindu system used by Belgian curator Victor Mahillion in the late 1800s. There are five categories of instruments in the Hornbostel-Sachs classification:

- Idiophones- instrument in which primary sound producing medium is the vibrating body of the instrument itself.
- Membranophones- instrument in which the primary sound producing medium is a vibrating stretched membrane (skin)
- Chordophones- instrument in which the primary sound producing medium is a vibrating chord (string)
- Aerophones- instrument in which the primary sound producing medium is a vibrating column of air
- Electrophones- instrument where the sound is differentiated electronically

Some notable examples from each category that can be used for your project:

Idiophones: cymbal, triangle, zils, slit drums, wood blocks, chimes, bells, glockenspiel, marimba, balaphone, xylophone, mbira, gongs, (Gamelan has: kenong, ageng, kempul, kempli, gansa, ugal, jublag, panyacah, jegogan), steel drums, jaw harp, shakers, rattles, guiro, bones, castanets, udu, Hang drum

Membranophones: drums of all kinds= djembe, ashiko, talking-drums, tar, tabla, mrdangam, taiko, powwow drum, bass drum, snare drum, timpani, surdo, repinique, cuica, conga, bongo, frame drums, tambourine, rik, kanjir, bodran

Aerophones: flutes (dizi, western, piccolo, shakuhachi, Native American, ocarina, recorder), trumpets and horns (French horn, bugle, shofar, kudu, trombone, trumpet, baritone, bugle, conch), pan pipes, didgeridoo, reed instruments (oboe, bassoon, clarinet, saxophone, harmonica, bagpipes, accordion, concertina), bullroarer, sirens, organ

Chordophones: zithers (autoharp, qanun, uhadi, berimbau, dulcimer), harps, kora, lutes (guitar, banjo, mandolin, ukulele, violin, viola, 'cello, double bass, bouzouki, sitar, oud, charango, guqin, koto, balalaika, ngoni, molo), piano, harpsichord

Electrophones: telharmonium, theremin, ondes Martenot, synthesizer, computer, midi-instruments, electric aerophones/ chordophones/ membranophones/ idiophones, turntables, magnetic tape, sequencers, samplers

### **Extra-Musical Associations:**

Many instruments have **extra-musical associations**. These are ideas that people have about the instruments that are supplemental to musical notes produced by the instrument. Many of these associations highlight what these instruments mean to the people who listen to them.

**Associations of location and culture** are found with instruments. The didgeridoo is typically associated with Australia. More particular knowledge of the instrument evokes thoughts of the aboriginal Australians who created and perform on it. The Brazilian **berimbau** is a chordophone associated with slaves who used the instrument to accompany capoeira. Capoeira is a martial art that is disguised as dance. Because of this the berimbau is associated with rebellion and resistance. **Steel pans/drums** are the national symbol of Trinidad and Tobago. They are 55-gallon oil "drums" that have musical notes hammered into one end. They are idiophones. Across the globe many people associate the sounds of the steelpan with idyllic island settings.

**Gender Associations** can be made about instruments when the instruments are designated to be played by either males or females. In many traditional African cultures many instruments are to be played only by males. The **mbira** is a plucked idiophone from the Shona people of the Zambezi valley in southern Africa. It is commonly associated with the country of Zimbabwe but has become a popular instrument across the continent and into the diaspora. In many cultural traditions this instrument is only to be performed by males. In ancient Egyptian society this

gender bias was not generally the case. The sistrum was an instrument only to be played by females. In American society traditional associations with regards to gender preference for instrumental performance exist, but are fading. The tradition used to have smaller instruments like the flute and clarinet being assigned to girls while larger instruments like the tuba and double bass were played by boys. The second way that instruments can take on gender associations is if the instrument itself is considered to be male or female. The Afro-Cuban bongos are a set of two drums where the larger drum is female (hembra) and the smaller drum is male (macho). This can be seen in American society with harps that are considered to be female.

Many instruments evoke **spiritual associations**. This can mean that the instrument is associated with prayer and worship. Examples of this include the **organ** (associated with traditional Christian worship), the **Shakuhachi flute** (associated with Zen Buddhist meditation), **kangling and conch shell** (Tibetan Buddhism=voice of Buddha), and the **mrdangam** drum (South Indian/Carnatic= association with Hindu deity Ganesh). Sometimes instruments help communication between the spirit world and the physical world. The Australian **didgeridoo** facilitates passage to “Dream Time” in Aboriginal practice. The **Bata** drums help to call down Orishas in Cuban Santeria. This is a religious practice of Afro-Cubans that combines African and European religious traditions. The **powwow** drum helps to cleanse/refresh the spirit of Native American males who play it while singing. Spiritual associations can also be generic associations of instruments with good or evil. This can be seen in American culture with the Harp association with Angels and the violin and guitar association with the devil.

When musical instruments have aesthetic associations they are often used as **visual works of art**. When instruments carry strong visual aesthetic value people often obtain them not to play music but instead to enjoy their look. Many instruments are carved or decorated in ways that make them valuable. The Tibetan conch shell is traditionally carved and encrusted with jewels. Gamelan instruments are ornately carved and become visual showpieces in temples where they are performed. Instruments can often be found on display in museums. Instruments valued for differing aesthetics can be found mounted on the walls of restaurants in the USA. Aesthetic value does not always mean “fine-art”.

**Cultural status** can sometimes be indicated by the music that one listens to or the instrument that one chooses to play. In pre-television America a favorite pastime was music making. In hollers and farmhouses of less affluent people instruments like the guitar, **banjo**, and harmonica were common because of their cost and availability. People who owned more complex and expensive instruments could show their cultural status by playing the genres associated with these instruments. To this day many Americans have pianos in homes where no one performs on them. The Korean **komungo** is a plucked zither that has fretted and non-fretted silk strings. It is traditionally associated with aristocratic courts and high-class status.

Often instruments are thought of **primarily as products to sell for profit**. If the instruments are manufactured poorly or not up to the standards needed to make music then they have an extra-musical association of being **substandard or cheap**.

When large department retailers sell musical instruments like guitars, drums, and keyboards they tend to have this association. In America inadequate versions of **West-African djembe** drums are commonly sold in import stores as “African” themed decorations. To the seller these are a marketable product. To the buyer these are generally an aesthetic visual accent.

Sometimes instruments retain (or increase) in value as time passes. If this is the case than the instruments can be thought of as **investments**. The European violin family of instruments became standardized in design and construction during the Baroque style period (1600-1750). The luthiers (violin builders) of that time (Amati, Guarneri, Stradivari) built instruments that remain renowned and sought after. These instruments have been valued for so long that often the **historical associations** add much to the value. These instruments now sell for millions of dollars at auction.

### **Ensemble basics/ranges:**

When two instruments perform together it is generally referred to as a duet or solo (instrument) with accompaniment. It is a common practice to accompany a melody on another instrument. In American Pop music there are many examples of artists accompanying their own singing by playing harmony and rhythm on guitar or piano. For this to be a duet there have to be two musicians.

When more than two instruments perform together the group is called an ensemble. Two musicians make a duet, three make a trio, four make a quartet, and so on. Instruments in an ensemble generally differ in **register** or in **timbre**.

**Register and range** refer to the “height” of a note or the height of an instrument’s **range** of notes. **Range** is the distance from the lowest to the highest notes that an instrument can play. In Western musical practice ensembles generally contain instruments that can cover the notes in four standard ranges: soprano, alto, tenor, and bass. These registers are associated with basic registers of the human voice. The basic vocal registers are:

**Soprano:** the high-female vocal range

**Alto:** the low-female vocal range

**Tenor:** the high-male vocal range

**Bass:** the low-male vocal range

Western vocal music is traditionally composed in a way that limits singers to their natural range. For western aesthetics each range is roughly two octaves. Choral music is commonly composed with four musical lines: sopranos, altos, tenors, and basses. Singers sing the line that fits their vocal range.

Instruments are also given these designations based on the ranges that they play. Some use the actual terminology of the vocal ranges to show the differing registers. An example of this is the saxophone (sax) family of instruments. Saxophones are single reed instruments of the woodwind family that are usually made of brass. The common high-pitched saxophone is called a soprano. The alto saxophone has the same timbre as a soprano sax but it plays a lower pitch range.

The tenor saxophone plays lower notes than the alto sax with the baritone playing even lower. Baritone indicates a pitch range in-between tenor and bass. There are several in-between and extended ranges. A common saxophone quartet includes a soprano sax, alto sax, tenor sax and baritone sax. These instruments all have similar timbre but they differ in range. Western bowed-lutes are also differentiated by the register of each instrument. The high-pitch instrument is called a violin. A viola is slightly larger and has a lower range. The violoncello ('cello) is lower still with the double-basses playing the lowest range of notes. A common string quartet consists of two violins, a viola, and a violoncello.

Because the aforementioned ensembles were all made of the same instruments they all had similar timbres. Ensembles in which all of the instruments have similar timbers are referred to as **homogeneous** ensembles. While this is certainly an apt description for ensembles of instruments that differ only in register (like choirs, saxophone quartets, and string quartets) it can also be true of ensembles that contain different instruments. Usually these different instruments are from the same family (but not always). Examples of this include woodwind ensembles (oboe, flute, French horn, bassoon, clarinet) and brass ensembles (trumpet, trombone, baritone, French horn, tuba).

Ensembles in which instrumental timbres vary are called **heterogeneous**. There are many genres of contemporary popular music that exemplify this concept. The basic band used in much instrumental pop contains a rhythm section (drum-set/kit, bass guitar, guitar, keyboard. In itself a rhythm section is a heterogeneous ensemble. The timbre of the drums is not meant to blend with the timbre of the guitar or piano. The drum kit itself is a heterogeneous instrument. The standard components of a drum set are:

- High-hat= two cymbals played together with foot pedal or a stick
- Ride cymbal= large cymbal that is meant for consistent patterns instead of accenting important moments
- Crash cymbal= smaller cymbal that is used to accent important moments
- Snare Drum= drum that has wires (snares) stretched across the bottom head
- Tom Toms- drums of various sizes
- Bass Drum- Lowest pitched drum

The cymbals have a different timbre than the drums. The high-hat has a different timbre than the cymbals. A snare drum has a different timbre than the other drums. Add to the rhythm section a lead instrument playing a melody and the timbres vary even more. This instrument is often the human voice but it can be a melodic instrument like trumpet, saxophone, or flute as well.

Often an ensemble has aspects that are both heterogeneous and homogeneous. Symphony orchestras are the large ensembles that play many popular genres of Western Art Music (symphony, concerto, opera, soundtracks for films/games, ballet). Orchestras are made up of four sections of instruments grouped by timbre (strings, woodwinds, brass, percussion). The art of orchestration refers to how a composer (or orchestrator) creatively uses the

varying timbres. Sometimes the composer will write for only one section, creating a homogeneous ideal. This can be contrasted with sections where the entire orchestra is playing, creating a heterogeneous ideal. Orchestration can also be heard in marching bands, wind ensembles, Chinese orchestras, Brazilian samba groups, Japanese gagaku, and in Indonesian gamelan orchestras.

Musicians in ensembles practice individually and then come together to rehearse. These rehearsals require coordinated efforts by the musicians to achieve a common goal. Often this necessitates a leader. In many large ensemble genres the leader is someone who organizes activities, conceptualizes musical goals, rehearses the group, and performs with the ensemble. Many drumming groups from around the globe are led by a master drummer who preforms cues and signals that guide the ensemble and dancers through the music. Jazz bands are usually led by a prominent band member who rehearses the group, and counts off (starts) tunes. The musical leadership role of symphony orchestras has evolved from a violinist who led the group while playing (much like a jazz band director). As the music became more demanding there was a greater need for the leader to lead without performing on an instrument. The result is a conductor who rehearses the group, starts and stops the ensemble, guides them through tempo changes, and inspires the best efforts of the musicians (and the audience).

### **Digital music:**

Perhaps the most important development in the history of musical instruments was the invention of digital audio production (computers). The computer has put the sounds of all acoustic instruments in the hands of the music producer. The computer allows producers the ability to create new timbres and instruments that are not limited by physical ability to perform. As with most musical innovations of the past we currently hear these innovations in dance music and in experimental genres. There is no end to the sonic possibilities of this relatively new instrument.

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