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Case Study: Orchestra Seating Arrangements

Overview. If you attend a symphony concert at any theatre or hall around the world, you will find one of two standard seating arrangements for a symphony orchestra. The first violins are always to the left of the conductor, while the second violins and the cellos may switch positions depending on the conductor's preference and the musical piece. The strings complete the first half-circle around the conductor, followed by rows of wind instruments, brass instruments, and finally percussion instruments. These two seating arrangements only became standardized in the 20th century; they are barely 100 years old. The history behind why musicians sit where they do is as much a story about acoustics and experimentation as it is about the music itself.

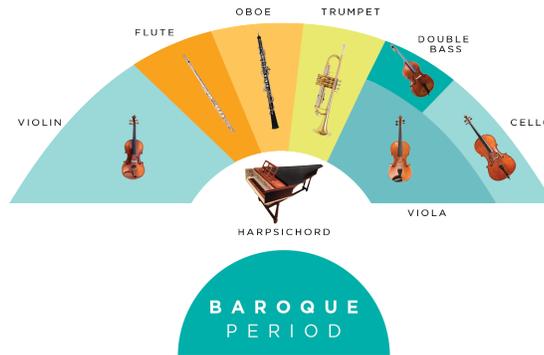
What is being organized? At first glance, it seems like the musicians are the physical objects being organized, but the organization is really based on the instrument each musician plays. Musicians that play similar type instruments (strings, woodwinds, brass, and percussion) are grouped together so they can hear each other. Strings often sit closer to the conductor, followed by woodwinds, brass, and percussion because of how far the sounds produced by these instruments travel. The conductor must be able to hear all of the instruments.

It would be unfair to regard musicians only as physical entities. Musicians embody much more than just their own individual selves and instruments. They are a part of an orchestra and are storytellers of a musical piece. Their notes are words that become sentences, and each time they perform, they are retelling the story. So it can also be said that the musical piece is being organized, and seating arrangements are one way conductors get to make reality their own interpretation of the story.

Why is it being organized? Musicians must be able to hear and see each other while they are playing in order to stay together in time. Sitting together in sections allows each distinct melody to come from one direction, making it easier for the conductor to give cues. When two sections have conversations, they repeat the same melody in response to one another, and placing two sections in close proximity where they can see or hear each other allows musicians to mimic each other's playing styles and dynamics for a more powerful exchange. This conversational exchange is known as antiphony, which is "a term for music in which an ensemble is divided into distinct groups, used in opposition, often spatial, and using contrasts of volume, pitch, timbre, etc."¹ Organizing musicians into sections also allows the audience to hear the melodies and harmonies from each section equally. Among other elements that add to the texture of the music, antiphony can be classified as a stereo effect, achieved by placing the first and second violins on the left and right stages of the conductor so the audience can easily hear this tradeoff. As a member of the audience, there is beauty in watching the bows of the string instruments move in the same direction as they play or seeing the bright gold trumpet bells project up and out into the hall during a fanfare. This scene is only possible if each section sits together.

¹ "Antiphony." *Grove Music Online*. 2001. Oxford University Press. Date of access 23 Apr. 2018, <<http://www.oxfordmusiconline.com/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000001036>>

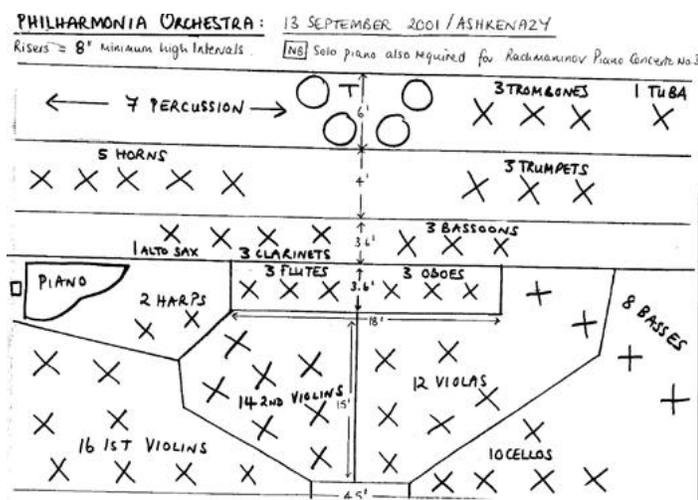
How much is it being organized? The primary organizing principle is the instrument type, but there are many other rules that fall under this main principle. There are four main types of instruments in an orchestra: strings, woodwinds, brass, and percussion. Each type contains multiple instruments. For example, strings include violins, violas, cellos, and double basses. Depending on the music period in which the piece was written, the piece will require different numbers of instruments or an instrument may not exist at all. For example, during the Baroque Period, there are no percussion instruments.



Source: <https://www.mydso.com/dso-kids/visit-the-symphony/orchestra-seating-chart>

Generally, string instruments are the largest category of instruments, so they are further grouped together into sections based on the parts they are going to play. The standard organization for string instruments is Violin I, Violin II, Viola, Cello, and Bass. Within these sections, string musicians are seated in pairs (called stand partners) and they share a stand to save space on stage. Since there are fewer musicians overall in the woodwinds, brass, and percussion sections, instead of having stand partners like the strings, each musician has their own stand.

Within each section and for each instrument, musicians are given chair numbers. For strings, the numbering starts from those who sit closest to the conductor to those in the back rows. The first chair of the first violin section is called the concertmaster; the first chairs of all the other sections are principal chairs. For woodwinds and brass instruments, the numbering starts from the center of the stage and goes out toward the left and right. This is so that the principals for each instrument are right next to each other, which is important because they tend to carry similar melodies and need to hear each other. For example, in the figure below, you can see that the principal flute and principal oboe are right next to each other.



Source: <http://andrewhugill.com/OrchestraManual/seating.html>

The second organizing principle depends on the sound projection of each instrument. Brass and percussion instruments can project farther than the strings or woodwinds. String and woodwind sounds cannot project through brass instruments, so they are placed in front. All orchestras are organized using these principles.

When is it being organized? There are two instances where the seating arrangement becomes organized. First, the seating arrangement is created while the composer is writing the music. Although the seating arrangement is not drawn out, it can be interpreted from the organization of the musical score. Depending on the story the composer wants to tell, he/she will select certain types of instruments (strings, woodwinds, brass, etc.) to carry out certain melodies and use other instruments for added color and texture. Similar type instruments are often playing either the same melody or complementary melodic lines because they produce similar sounds and add the same type of texture to the piece. When these ideas and stories get translated onto a musical score, composers will group similar type instruments together so the conductor will be able to easily identify different harmonies and melodies at any moment in the piece. The musical score is organized in a way so that any conductor can look at it and know exactly what is happening.

V.
 Songe d'une nuit du sabbat
 Hexensabbat The witches' sabbath
 Larghetto (♩ = 60)

The score is organized into four main sections, each with a color-coded bracket on the left:

- woodwinds** (red): Flauto I & piccolo, Oboi, Clarinetti I & II, Cori I, II, III, & IV, Fagotti I & II, III & IV.
- brass** (orange): Trombe in Es (Mb), Cornetti in B (Sb), Tromboni I & II, Trombone III, Tuba.
- percussion** (blue): Timpani I in H (S) E (M), Timpani II in G (S) G (M), Gran Tamburo (Grosse Caisse), Due campane (2 Glocken) in C (G) G (Sul).
- strings** (purple): Violino I (1. and 2. violini), Violino II (1. and 2. violini), Viola (1. and 2. violini), Violoncello e Contrabbasso.

At the bottom of the score, there are performance instructions in French, German, and English regarding the use of double basses for the C and G notes.

The second instance of organization takes place in real time when a conductor decides to perform a piece with his/her symphony orchestra. The conductor must take into account his/her own seating preference, the era to which the musical piece belongs (which determines the instruments that are included in the piece), and the theatre or hall in which the piece will be performed. The acoustics of a concert hall are impacted by fabric choices, chemical compositions of paint, and even the materials used for the floors. According to acoustician Robert Berens, for effective absorption and reverberation of sound, the hall cannot be too dry (or

there is no reverberation) nor too echoey.² “The sound produced on the stage not only goes directly into the hall but also bounces off everything in sight and earshot—side and rear walls and ceiling—at minutely different times. That combination—the magic formula for absorption and reverberation—is what creates the overall hearing experience.”³ This also explains why most concert halls have similar structural elements, regardless of when they were built.⁴

How or by whom is it being organized? Conductors are the primary organizers. Most composers did not explicitly state how they wanted the orchestra to be arranged and are not alive to consult each conductor, so conductors have experimented over time with their respective orchestras to arrive at the most common seating arrangements we know today.

Orchestras did not always have conductors. They started off as small chamber groups and ensembles comprised of mainly string instruments and the harpsichord. They were mostly led by the concertmaster (first chair of the first violin section) or by the composer, who sat at a piano or harpsichord in the center (where the conductor stands today). Cellos and double basses were sometimes found in the center of the orchestra, since their deep sound provided a foundation for the other instruments to build upon. During the Classical Period, Austrian composer Joseph Haydn organized his 40-member orchestra by placing the first and second violins across from each other to personify antiphonic texture, so their phrases could be heard from opposite sides of the stage. It made sense musically and visually. In many musical scores, composers wrote passages for the two violin sections that traded off. Throughout the 18th and 19th century, these two sections remained in the same location while other instrument sections moved around.

As cities expanded during the Industrial Revolution, orchestras did too. Orchestras were now made up of 100 musicians, and the role of the conductor became more important to make sure everyone was playing together. Conductors began to experiment with seating arrangements. The influential conductor Leopold Stokowski “tried seating the orchestra in every imaginable way, always trying to find the ideal blend of sounds. On one occasion he horrified Philadelphians by placing the winds and brass in front of the strings...but in the 1920s he made one change that stuck: he arranged the strings from high to low, left to right, arguing that placing all the violins together helped the musicians to hear one another better. The ‘Stokowski Shift,’ as it became known, was adopted by orchestras all over America.”⁵ As this seating arrangement became more common, composers also began experimenting with their music. Shostakovich’s Symphony No. 5 contains three parts for the two violin sections, which only works for the musicians if the first violins and second violins are sitting together. Ultimately, orchestra seating arrangements reflect a relationship between the conductor, the concert hall, and the musical score. It gives the audience a timeless experience that they otherwise would not be able to have through a recording.

² Sandvig, John, “What Do Acoustical Consultants Actually Do?” *ABD Engineering & Design*, April 17, 2018, <https://www.abdengineering.com/blog/what-acoustical-consultants-actually-do/>

³ Schwartz, Lloyd, “Seen and Heard: Boston Symphony Hall,” *ArchitectureBoston*, 2012, <https://www.architects.org/architectureboston/articles/seen-and-heard-boston-symphony-hall>

⁴ Taka, Tomo and Emma Tucker, “21 of the world’s most beautiful concert halls,” *The Spaces*, August 30, 2016, <https://thespaces.com/2016/08/30/21-of-the-worlds-most-beautiful-concert-halls/>

⁵ Lewis, Courtney, “Conducting Electricity: There’s a science behind where symphony musicians sit on stage,” *Jacksonville*, April 30, 2017, <http://www.jacksonville.com/entertainment/music/arts/2017-04-30/conducting-electricity-there-s-science-behind-where-symphony>