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BETWEEN FLUTE AND PICCOLO

Exploring Switching Between Flute and Piccolo with Stravinsky's The Firebird Suite as an Interpretational Case Study

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ABSTRACT

In this thesis I have explored what happens in my playing when I change between the flute and the piccolo. This thesis supported my daily practice and gave me ideas how to improve my playing technique when switching between the two instruments. I also included a symphony orchestra setting, where a flutist often has to change between instruments, and used Stravinsky's The Firebird as a case study. To analyze my playing, I recorded audio materials from my seat in the orchestra, so I could have a better understanding what my playing really sounds like. Since I have played the flute much longer, and already had a good technical competence, this thesis focuses more on the piccolo. Especially on the moment when I change from flute to piccolo. The purpose of this thesis was to help me gather my own realizations in my playing technique and interpretation of my part in orchestra and at the same time offer inspiration and insight for anyone interested on the subject. My realizations in this thesis come from an individual perspective that is based on my own anatomy and to the instruments I use. I gathered information focusing on the technical aspects of playing my instruments, and what happens physically when I change instruments. Exploring these aspects gave me an understanding of what are the most important things I should focus on. These include for example embouchure flexibility and air support.

Keywords:
Flute, Piccolo, Orchestra Playing, Stravinsky, Firebird Suite (1945)

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1 INTRODUCTION

1.1 Background

The flute and piccolo are both known members of the woodwind family, and they both have unique characteristics which have shaped the role how they are used in orchestras and classical music. The flute has been used in classical music already for centuries, and is known for its beautiful high tone, often shining at the top of an orchestra. The piccolo, higher-pitched and smaller instrument, can both highlight and balance the full sound of an orchestra.

There are speculations when piccolo made its first appear in orchestras, and it's not always clear if it was piccolo or recorder that was used, but we know piccolo was used by for example Rameu, Mozart and Gluck in some of their operas. Later Rossini started writing extensively for piccolo in his operas, but the first composer who actually used piccolo in a symphony orchestra was Beethoven in his 5th and 9th symphonies. After that the use of piccolo in symphony orchestra grew and it became a permanent member of the symphony orchestra instrumentation like we know it today. [1]

As a today's professional flutist you are expected to be also a fluent piccolo player, who is able to switch between the two instruments effortlessly and with ease. In orchestra music, the piccolo part can be its own part, or it can be mixed, so one player will switch between flute and piccolo when needed. Sometimes these changes can be quick and technically challenging. Many other musicians also switch instruments in different instrument groups such as Brass or Percussion. Talking with my musician colleagues makes me even more aware of how important it is to know each instrument individually and the different playing techniques behind each unique instrument.

Many might think that it's easy to switch from flute to piccolo, and that piccolo is basically just a mini version of the same instrument. Even though flute and piccolo come from the same instrument family, and have some similarities, they are not the same instrument so adjustments are needed. Each have different technical aspects and features, and it will make a huge difference in the sound quality and interpretation, if a player knows how to take these differences into consideration. The

[1] Jan Gippo, *The Complete Piccolo* (Theodore Presser Company, 2009), 31.

changes happen for example in embouchure, articulation and air pressure. By exploring these changes and knowing how the two different instruments react, it's possible to find the best qualities in sound and technique with both instruments.

My interest for this topic comes from personal desire to learn more how to improve playing both instruments, focusing especially on that moment, when changing between flute and piccolo. I strongly believe that focusing on the technical aspects of what happens, or what should happen, when I change instruments, will improve my skills as an orchestra musician. I also have a pedagogical interest, because it's likely I might one day end up teaching young flutists who are starting their journey with the piccolo or need advice on their way. After having delved into this topic, I will have better abilities and more knowledge and experience to guide others interested in this topic.

1.2 Aim of the Study

The aim of this thesis is to ease that moment when a flute player changes instruments from a concert flute to a piccolo flute and back. These moments can happen when playing in an orchestra, playing chamber music or solo repertoire, participating in auditions or competitions, or rehearsing in your practice room. Many flutists usually start to practice the piccolo later, when the basic knowledge and technique of flute playing is already at a good state. This thesis is also written from the point of view, where a flute player already knows the basic technique of flute playing, and can now use that information also in piccolo playing. The aim of this thesis is to deepen this knowledge to a more precise level, and discover the differences in technique when changing between these two instruments. This thesis is written primarily to support my own learning process and research in this topic.

There are many technique books for the flute and some for piccolo, focusing on the instruments itself and the many solos in the orchestra repertoire. I find that as important it is to practice these solos and the instruments individually, it is as important to practice to change between the instrument quickly, as it often happens in an orchestra. We are all individuals and it gets highlighted also in this research. What works personally for me, might not work at all for somebody else. Also different instruments can have very different qualities, and it's very important to remember that I'm

writing from a perspective, what works for me with my own instruments. This research can however offer ideas and inspiration to every flutist who is practicing also their piccolo playing.

1.3 Research Questions

My main research question is what are the major technical differences between flute and piccolo playing, and how can I improve them so changing between the two instruments feels more smooth and secure. I hope to find out concrete changes that needs to physically happen, so I can have a better understanding of the differences in the technique. My other research question is, how can I use my realizations in symphony orchestra setting, while working with Stravinsky's Firebird Suite, to support my interpretation of the piece.

1.4 Methods and Materials

To collect my realizations, I'm compering different aspects of technique both when playing flute and piccolo, so I can notice the changes what I do with both instruments. From there I'm able to find what I should change or take in consideration when I change between the instruments. In this thesis I focus on changing instruments in a symphony orchestra setting. I have chosen a project where my university's symphony orchestra is going to perform Stravinsky's Firebird Suite, and I'll be playing the second flute part, including piccolo. In this piece I will change between flute and piccolo many times, and I get to practice my realizations in action.

To support my artistic process with changing instruments in the Firebird, I'm making an audio recording. I will place the microphone close to me, so I can listen and analyze afterwards what kind of technical changes I'm doing, and what should I improve.

I am also using books written about flute and piccolo technique to support my research. I will use the existing information and knowledge gathered form these books.

2 TECHNICAL ASPECTS OF PLAYING FLUTE AND PICCOLO

2.1 Physical Differences

The most obvious difference between flute and piccolo is the size. The small size and shorter tube of the piccolo affects the instruments pitch and range, making the piccolo sound one octave higher than the flute. With the smaller size comes also smaller embouchure hole in the mouthpiece, smaller keys which are closer to each other, that then changes finger placement. The piccolo doesn't have a separate footjoint like the flute, which makes piccolo's mechanism a bit different, and limits the lower register not to reach as low as the flute's. Piccolo is also much lighter to hold than the flute.

Other easily noticeable difference is the material of the instrument. Both instruments can be made from similar materials, usually metal or wood, but more often piccolo is made of wood. Wooden instruments are more popular especially among symphonic orchestra musician, because of the warmer and softer tone it produces. With flutes metal, such as silver and gold, is usually more popular than wood.

2.2 Embouchure, Tone Production and Vibrato

The most important adjustment to make when playing the piccolo is the increase in air speed and support for the breath.[2] It's good to remember you are playing an octave higher than with flute. The piccolo has a smaller embouchure hole, which requires more focused and precise airstream. To make this happen, a player should adjust their embouchure to create a smaller aperture for the air. To meet this need the lips will have to be trained with sound exercises.[3] The embouchure hole is too small to allow huge quantities of air, and if you are to avoid tiring the embouchure, the air speed needs to be very fast.[4] It's good to remember that the embouchure adjustments needed with piccolo

[2] Patricia Morris, *The Piccolo Study Book* (Novello Publishing Limited, 1998), 4.
[3] Trevor Wye and Patricia Morris, *Practice Book for the Piccolo* (Novello Publishing Limited, 1988), 5.
[4] Morris, *The Piccolo Study Book*, 4.

are very small, much smaller, than for the flute.[5] With piccolo, even minor changes can affect widely the tone or the pitch. When practicing, it's important to stop if your lips start to feel strained and tired, and never squeeze the notes out.[6] The support and control comes from the abdominal muscles which should be activated even more when playing the piccolo.

Piccolos don't usually have a lip plate on the mouthpiece like flute does, and this creates a different feeling when the instrument is placed on the chin. Due to this piccolo is often placed a little higher on the chin and the lower lip. On the other hand, one should be careful not to cover too much of the embouchure hole with the lower lip. This of course depends hugely on your instruments. Some piccolo models have waves or different shapes of the embouchure hole on the mouthpiece. Finding the perfect placement and angle is also affected by each person's unique anatomy of the lips. Your experience and tone exercises will help you to find the right spot. Experiment also using the mirror and your ears for help.[7] You can use the same tone exercises for piccolo, that you are using with flute. For example, playing simple long notes or different sonority exercises.

Vibrato is an important tool when making different characters and tone colors. If your vibrato is fine on the flute, it will be too wide for the piccolo. You can imagine switching from a violin to a cello, violin being the piccolo and cello being the lowest octave of the flute. Vibrato on the piccolo needs to be faster and shallower.[8] Vibrato should always be inside the tone, imagine adding focus and clarity to the tone while practicing vibrato. It should always be controlled, because too much vibrato on the piccolo can cause pitch instability.

2.3 Articulation and Finger Technique

Articulations include many different elements such as tonguing, legato, different slurs and staccatos etc., but now I want to focus especially on tonguing since it requires the most attention when changing between flute and piccolo. Overall can be said that on the flute articulations can feel more rounded and smooth do to its softer sound. With piccolo articulations are crispier and more focused, and need to have more air speed on the back especially in the higher register. Articulating softly

[5] Morris, *The Piccolo Study Book*, 4.
[6] Wye and Morris, *Practice Book for the Piccolo*, 5.
[7] Wye and Morris, *Practice Book for the Piccolo*, 6.
[8] Wye and Morris, *Practice Book for the Piccolo*, 18.

when playing pianissimo in the higher registers can be challenging, so it's a good to give this topic some special attention when practicing.

The basic technique of tonguing including single, double and triple tonguing with the flute is transferable to the piccolo. What to take into consideration when changing to piccolo is that the tongue should interfere as little as possible with the airstream. Everything is reduced in the size on the piccolo, also the movement of your tongue. The movement should be very light, the tip of the tongue moving the shortest distance, creating the minimum disturbance in the mouth. [9] If the tonguing on piccolo feels stiff or clumsy, it might be that the player is using the whole tongue when articulating, which can cause tension and activate the throat too much. Ideally, only front or tip of the tongue is active, so the articulation can stay light and smooth. It's very important not to forget a good tone when practicing the tongue articulations.

Like mentioned before, for many players a good placement for the piccolo is a bit higher on the lower lip than the flute. This can cause that the piccolo is not so easy to balance securely and it can feel harder to keep fingers moving independently. With piccolo's smaller size the keys are closer to each other, which creates a different feeling to finger technique than with flute, and can create challenges with evenness before getting used to the change. [10] On the other hand, the piccolo can feel more easy if a player has small hands, because flute with wider spaced keys creates more finger stretch. It's very individual which instrument feels more natural in one's hands.

Finger technique on the piccolo can feel faster and more agile, because the smaller key spacing allows quicker movements and piccolo itself is a lighter instrument to hold. On the piccolo pressing the keys usually requires less force because the instrument has a lighter key mechanism. Mastering the finger technique for both instruments needs a lot of practicing on the instruments individually and then developing a balance between speed and accuracy, that can be shifted when changing between the instruments.

[9] Wye and Morris, *Practice Book for the Piccolo*, 47.
[10] Morris, *The Piccolo Study Book*, 42.

2.4 Intonation and Dynamics

Intonation is a crucial element both in flute and piccolo playing, especially when playing in an orchestra. The flute has a larger bore and a longer tube, which makes it easier to control the intonation. With piccolo intonation is much more sensitive to any tiny changes for example in embouchure, air pressure, finger positioning or even temperature and humidity. The smaller tube of the piccolo cools down or heats up faster, making it more difficult to keep in tune during long performance. Especially if there's a lot of breaks between playing. Due to the high pitch of the piccolo, intonation issues are more noticeable, while flute blends much easier with other instruments.

Unfortunately, the scale of the piccolo, meaning tone hole placements, don't seem to have been regularized. This means big differences between instruments and models. [11] Overall tuning on the lower register tends to go flat, and upper register sharp, especially in loud dynamics. To help with this challenge, there are plenty of alternative fingerings for both piccolo and flute, that can either make the notes higher or flatter, or work in different dynamics. I'm not going to go into detail about the different fingerings in this thesis, one could write a whole thesis just about that topic, but it's good to know that they exist.

What really helps is if you know your own instruments. If you are aware which notes are easily more flat or sharp on your instruments, it's easier to fix them. Most likely it's different notes with your flute and piccolo, so it's really important to know both of your instruments well, and try to remember the differences when changing instruments. You can practice intonation by playing with a tuner, it's also good for ear-training. It's a good idea to start with the perfect intervals such as octaves, fourths and fifths, and playing these intervals in different registers and keys. You can play the same passages first with flute and then with piccolo, and discover what are the tricky spots or notes. And if some notes are really difficult to get in tune, remember the alternative fingerings.

Dynamics require good control of your face muscles and embouchure. My experience is, that with piccolo you take further everything you have learned with the flute when it comes to the dynamic range. Being able to have a versatile dynamic range from the softest pianissimo to a glorious fortissimo, which are both much needed in the orchestra playing, you need to know your

[11] Wye and Morris, *Practice Book for the Piccolo*, 17.

instruments well. Then you can become an expert in the direction and amount of air you need in the different registers. Due to piccolos size and high pitch, it can be harder to play very quietly especially in the high register.

When it comes to dynamics flute is more flexible across its registers. With piccolo you have to balance air pressure and find the right embouchure to achieve the wanted dynamic while keeping a good tone and intonation. Making a small blowing hole with your lips, without too much tension, and keeping your airflow going helps with the high register on piccolo.

2.5 Ergonomics

Piccolo is smaller and lighter, so it makes sense it is less tiring for the body to play the piccolo for a long performance. Arms and hands can be closer to your body and more relaxed. It is always important to make sure you're playing in a good position, and be aware of any tensions or pain that may occur. Stretching before and after playing, and taking care of your physical shape is a good way to prevent injuries.

The most important part to take into consideration is your ears. Piccolo's high pitch and volume is no joke. It can make serious damage to your hearing, which is why it's really important to use ear protection both in the practice room and in a concert setting. There are different kinds of earplugs available, and many musicians prefer molded earplugs, that I also could recommend. They fit better than regular ones, and can be adjusted to meet a volume level of a classical orchestra. I've also heard some players like to use cotton wool in their ears, so the main point really is just to protect your ears.

3 WORKING WITH STRAVINSKY'S FIREBIRD

To test my discoveries in an orchestra setting, I wanted to take an example from the orchestral repertoire, where I had to change between flute and piccolo. My university's symphony orchestra performed Igor Stravinsky's ballet suite The Firebird (1945) in February 2025. In this project I played the second flute part including piccolo, so it was the perfect opportunity to document my process. I'm going to present excerpts from The Firebird where I change instruments. I'm also adding recorded audios of the excerpts in the appendix of this thesis. The microphone was placed next to me, so I could hear my own playing clearly and focus on analyzing it more easily.

3.1 Brief Background of the Firebird

Igor Stravinsky (1882-1971) was a Russian-born composer, who is considered one of the most important and influential composers of the 20th century. He composed during the modern era and is best known for his groundbreaking ballets including The Firebird, Petrushka and The Rite of Spring, which all shocked audiences with bold rhythms and harmonies during the time. The Firebird is based on Russian folk stories and it tells the story of a prince, who wanders into a magical garden and captures and frees the magical Firebird. The Firebird later helps the prince to defeat an evil sorcerer and break a spell over enchanted princesses. The story ends with a freed kingdom and the prince marrying the princess he loves. [12]

The most of The Firebird was composed during December 1909 and May 1910, and the 45-minute ballet had its first performance in Paris on June 1910. It's written that in the first orchestra rehearsals Stravinsky had to explain the music for the players and dancers missed entrances because the sonorities of the music were so unexpected. But The Firebird was a success and opened new doors for Stravinsky especially in Paris. Later, in a need of income, he tried to take advantage of an existing copyright score, he made a new suite of The Firebird for a bit smaller orchestra and sold it to a new publisher. Today this version is known as the 1919 version of The Firebird. Later he made

[12] Walsh, Stephen. "Stravinsky, Igor." *Grove Music Online*. 2001; Accessed 1 May. 2025. https://www.oxfordmusiconline.com/.
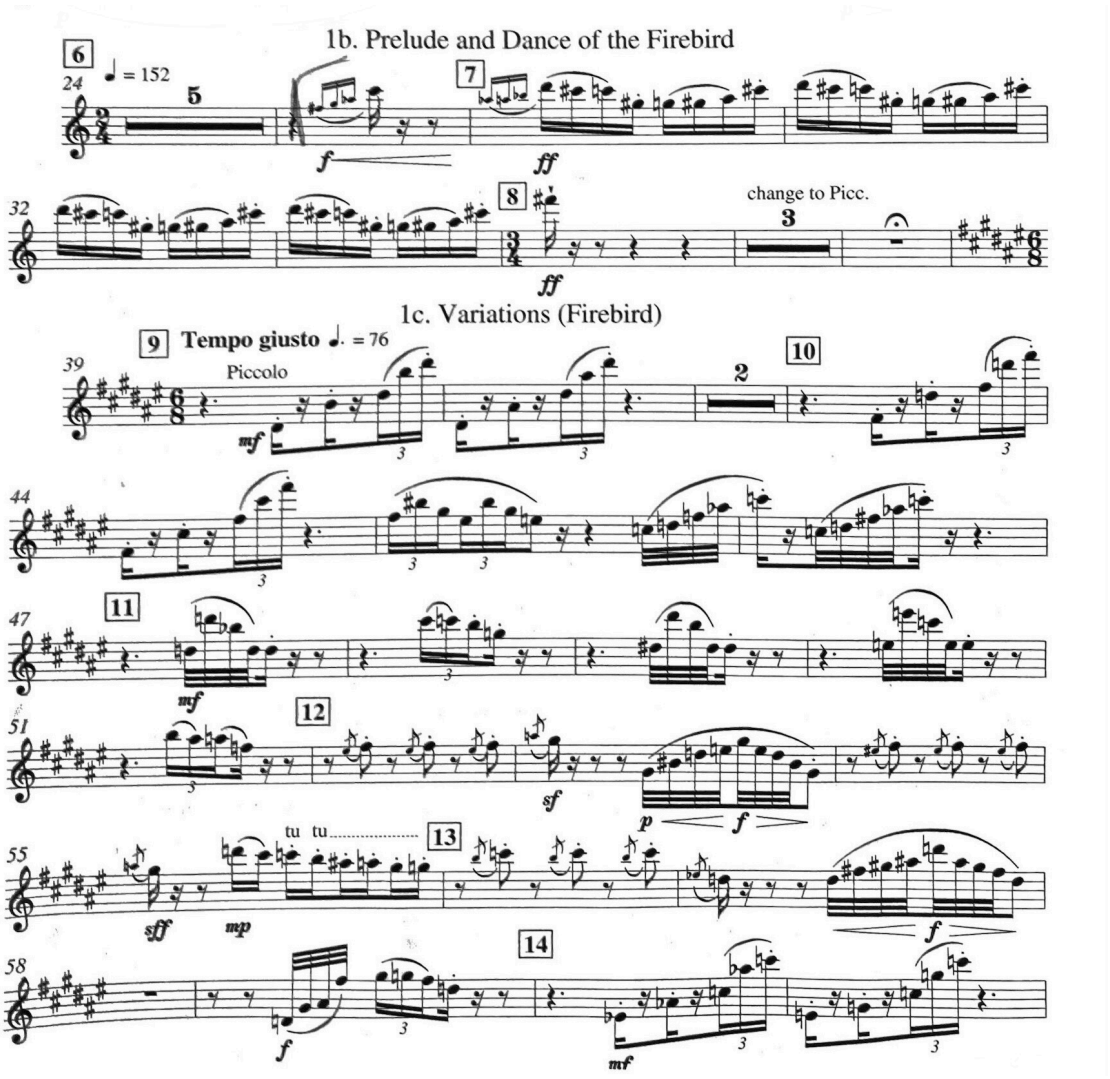
yet another suite of The Firebird that is just a bit longer than the one before, including more music from the original ballet and with a slightly different instrumentation. One could say he's purpose was to create this one for the American orchestras and to maintain copyright control in the United States. This version we know todays as the 1945 version. [13] When I refer to The Firebird from now on, I always mean the 1945 version, which was the one I was working with.
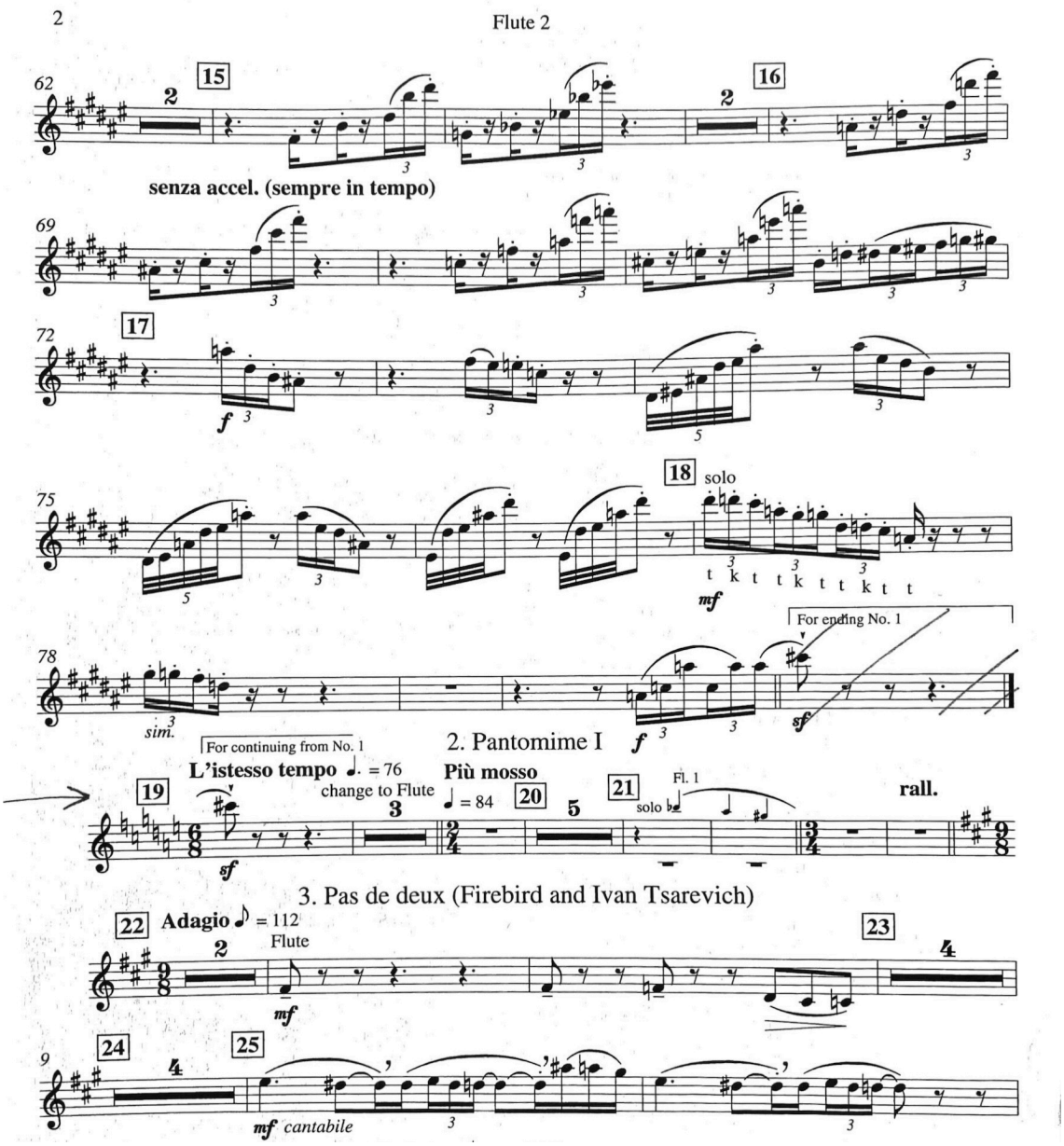
3.2 Analysis of the Excerpts

Here I will analyze some excerpts from The Firebird where I changed instruments from flute to piccolo. I will tell what were the most important aspects I was thinking or what I did when changing instruments, and how I practiced them. I have chosen the excerpts because they felt useful for my own research and practice. This is my personal analysis and learning experience of the excerpts, and it should be considered as such. In this edition of the score of the second flute part, I'm using the big rehearsal numbers to indicate a certain part instead of bar numbers. This is because the bar numbers are changing in every numbered movement and I think it's more clear to refer to the big rehearsal numbers since they are continuous throughout the piece.

[13] Walsh, Stephen. "Stravinsky, Igor." *Grove Music Online*. 2001; Accessed 1 May. 2025. https://www.oxfordmusiconline.com/.

Music Example 1. Flute part 2. Stravinsky, The Firebird, 1b., 1c., 2. and 3., rehearsal numbers 6-26.





The first change from flute to piccolo is to the famous flute/piccolo excerpt from the Firebird. The 1c. "*Variations (Firebird)"* is an orchestral excerpt for both flute and piccolo, which is often asked in orchestra auditions. This is a very technical place with tricky passages and rhythms in a quick tempo. In the second flute part it's also the first thing you will play with piccolo. It's really important that you have done a good warm up before the performance. There's only four bars to change your instrument, and get ready to play the piccolo part, so it's a quick change and you need to be prepared for it. The "*Variations"* begin with big interval jumps, so it's important to have a flexible embouchure, so all of the notes can speak. Main things I thought and did here when I switched to piccolo were faster airspeed, more focused and smaller embouchure, bigger support from abdominal muscles and a lighter tongue for the staccatos. Also because it's a fast passage with

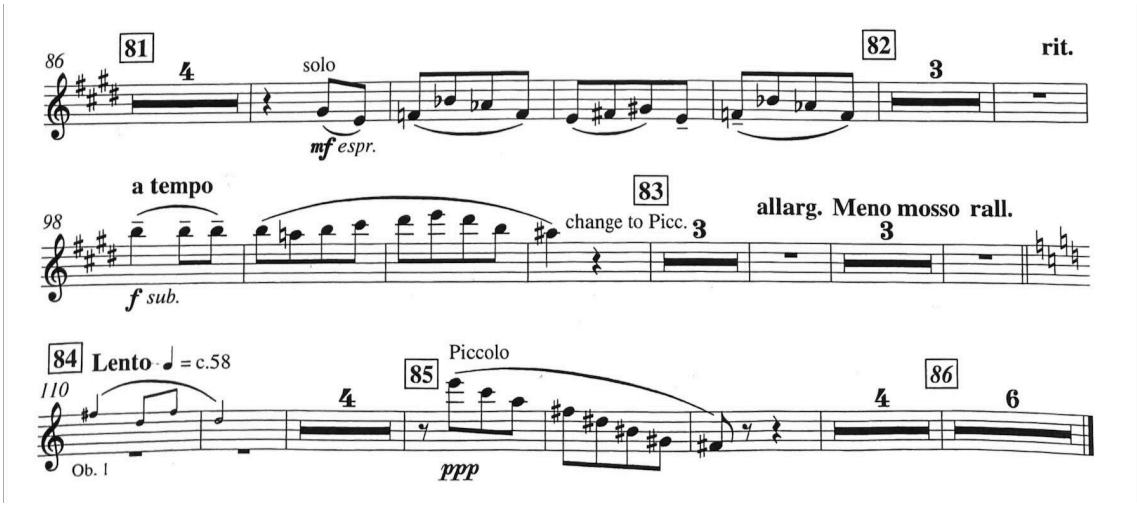
quick fingerings, it helps if you have a good muscle memory form the instruments, so your fingers won't get confused about the smaller instrument and shorter distance.

I practiced the change with a metronome, to have a clear idea how much I would actually have time to change the instruments. I also practiced a lot and for a long time with a slower tempo, especially the "*Variations"* so my finger technique and tongue would work together with the piccolo. One of the most helpful things I did was that I asked the flutist playing the first flute to play this excerpt with me, so I could practice to match my playing with theirs. I wanted to include this whole variation because of its fame in the repertoire and at least I would be disappointed as a piccolist if I couldn't hear the whole excerpt.

I am quite happy how the "*Variations"* is sounding on the audio. I like the effect we were able to create within the woodwind section and I'm satisfied with my piccolo intonation. Although it's not an easy change from the flute I'm happy how I managed to make all of the notes speak from the start, even the lowest ones that start the *"Variations".* I managed to do this by really relaxing my embouchure as much as possible yet keeping a good support for the air. I feel that sometimes the articulation could have been even more clear. This is where the different articulation of the flute and piccolo gets highlighted, and for next time I would focus more on the piccolo articulation, and practice my tongue placement on the piccolo, which I believe could be the key. In rehearsal number 16 (Sound Recording 1, 01:08) it's hearable on the audio recording that I'm lacking airflow and air support and the highest notes in the bar are not coming out as shiny as I would hope. But I'm glad to notice I immediately fix it in the next bar. I wanted to record only the "*Variations"* since I there's a long brake coming and the next switch to flute is quite easy. In the next chapter I will analyze the change I did, but I decided to leave it out from the audio recording since it is not so relevant.

The next change back to flute is nice and easy with a lot of time, because the 2nd flutist doesn't play anything in the 2. "*Pantomime I"*. The first notes in 3. "*Firebird and Ivan Tsarevich*" are in the low register so I changed my embouchure to fit the low register of the flute. I aimed for a relaxed and resonant embouchure, placing my chin lower than I just had with the piccolo. I felt it easier to approach also the technical aspects by thinking about the character change. In rehearsal number 25, I wanted to play a relaxed, singing long legato line with a warm sound on the flute. I practiced this like it was a sound exercise, and sometimes I played the line first with piccolo and then with flute, to find the right embouchure for both instruments.

Music Example 2. Flute part 2. Stravinsky, The Firebird, 7., rehearsal numbers 81-86.



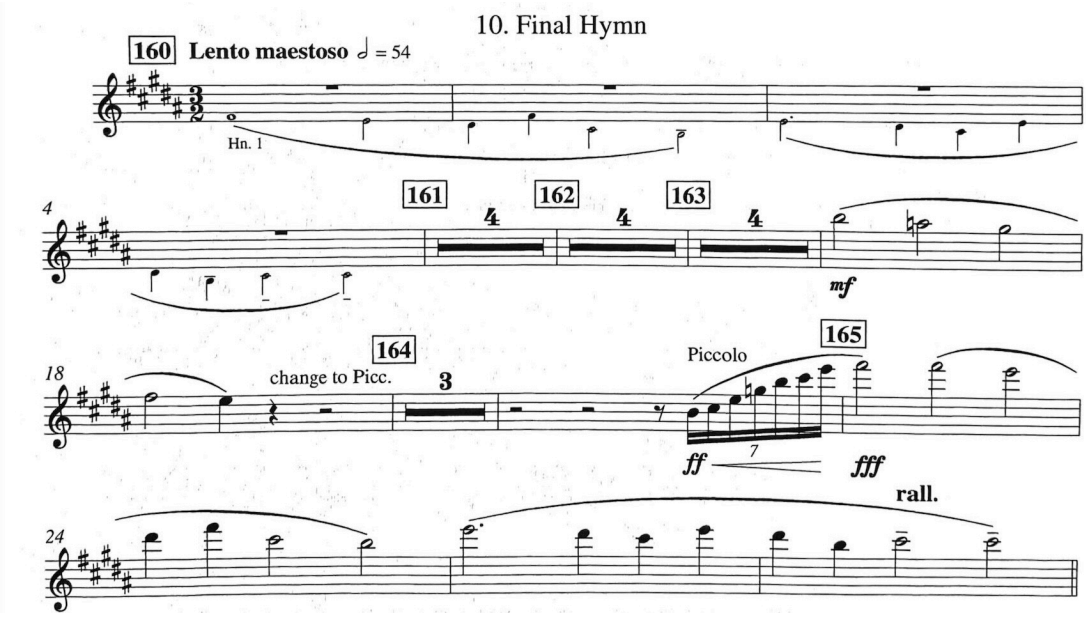
In Music Example 2. "*Rondo (Khorovod)"* rehearsal number 81 the part is played with the flute. There's a low register solo followed with a four bar break, and then a melody line supporting the first flute. This is quite easy because previously in the music there's only flute so the change to piccolo in rehearsal number 85 is the next change to piccolo after the "*Variations*". The change in rehearsal number 85 is in my opinion one of the trickiest in this whole piece. Good thing is there's time well enough to switch instruments and mentally prepare. This change is significant in dynamics, embouchure and airflow. Last thing I played with the flute was a comfortable forte and now the first thing I have to play with the piccolo is a pianississimo (ppp) starting from a high note, which can feel everything but comfortable for a player. When I played this in the orchestra I tried to listen to the intonation very carefully. This passage is very hearable, because the orchestra is very softly written there. So intonation was everything and each note had to be perfect all within a legato line. I prepared my embouchure for the high e by making my embouchure hole smaller. I had a great support from the abdominal muscles so that also my airflow would be enough to support the high note and make it speak. I did a soft articulation for the first note so that it would support the soft dynamic and character.

In the practice room I played this passage very slowly with the tuner, to check that my intonation was correct at all times. I also practiced with a recording, so I could hear the orchestra background. The switching of the instruments I practiced by playing the melody four bars before rehearsal number 83 with flute and then switching to piccolo and playing the passage from rehearsal number 85. At first I played everything without thinking about the dynamics and only focusing to a good

sound quality, and then by making slowly changes I started to reduce the dynamic on the piccolo so I could eventually reach the marked piannissisissimo dynamic. It helped me to think that instead of playing just a “piannissisissimo”, I would play a dynamic I describe as soft, quiet, fragile and airy.

To be honest I’m quite proud of this change on the audio recording. In my opinion, playing high notes softly on the piccolo is one of the hardest things there is to do on the instrument. Even though the sound comes out as soft and airy, the support a player must do behind it is greater than ever expected. The low flute register solo 5 bars after rehearsal number 81 (Sound Recording 2, 00:08) was comfortable for me because I’m already comfortable with my flute in all registers. And so was the next phrase 4 bars before rehearsal number 83 (Sound Recording 2, 00:22). But the switch to piccolo was one of the frightening moments in this piece. Like you can hear in the audio recording (Sound Recording 2, 00:48), strings play super softly on the background, and winds play these small little melodies on top of the harmonies, so there was no hiding. In rehearsal number 85 (Sound Recording 2, 01:03) I’m very pleased how the first note on the piccolo came out, without too harsh articulation. I’m also happy about the intonation. Even though I’m pleased with this excerpt, in the future I would challenge myself to make it even softer with a better legato.

Music Example 3. Flute part 2. Stravinsky, The Firebird, 10., rehearsal numbers 160-166.



In this last excerpt the first thing I played in the "*Final Hymn*" after rehearsal number 163 is a long legato line with the flute. The switch happens one bar before rehearsal number 165 and the rest of the piece is played with the piccolo. This excerpt is a great practice for piccolo intonation, the use of air including airflow and support. The switching between instruments was quite comfortable here, because I could play the ascendant scale going to the high note in rehearsal number 165. But intonation was another thing. There were many woodwinds playing the same sounding f sharp, including the first flute and clarinet. Making this unison note sound right within all of us needed some adjustment. Here the alternative fingerings of the piccolo come in very handy. Especially for the high notes, there are many variations from where I could choose the best one for me and my piccolo. For me the best fingering was actually the original one, but I know many might prefer to play it by using the right hand middle finger key instead of the ring finger key. This is a classic excerpt where the piccolo really is shining at the top of an orchestra. I tried to find a good supportive fortissimo sound, without pushing or sounding too loud. Even if shining on the top, the piccolo sound should mix with the orchestras, and especially to the woodwind sound. I used a lot of support from the abdominal muscles to create a long support for the line. I listened very carefully for intonation, getting support from first flute and clarinet and matching their sound and intonation. Compared to my previous flute embouchure, I played with a smaller embouchure hole with the piccolo and my airflow was quicker.

I practiced a lot with a tuner, and focused again to switching the instruments in the practice room. I played this excerpt with both flute and piccolo, and it helped to find the right tuning and airflow for both instruments. I also explored with a different fingering options to find the best ones for me. I found it really useful to practice just the scale going into rehearsal number 165 and playing the first note of 165 long. I did this in different keys and it was really useful to get to know my instrument better, and how every key needed different adjustments for the long high note. I really liked playing this melody from the "*Final Hymn*" (from rehearsal number 165), and explored by playing this melody in different dynamics. The original key is not the easiest so it was very useful to practice it in different dynamics and let my embouchure and airflow adjust. I will definitely keep this exercise in my repertoire also in the future.

Listening the audio recording, the intonation is the first thing that comes to my attention. Five bars after rehearsal number 163 (Sound Recording 3, 00:18) the flute line sounds again as comfortable as I remember it felt when I played it, but the switch to piccolo was not so comfortable. And that's mainly because of the intonation. Like I wrote before, the scale going to rehearsal number 165

helps a lot with the change of instruments (Sound Recording 3, 00:38). I think it would be more challenging to play the high f sharp in 165 without the scale leading for it. In rehearsal number 165 (Sound Recording 3, 00:39) I'm happy about the legato and calm character of the line, but I do think the intonation could be a bit more on point. On the other hand, it's good to remind myself that I had my microphone just next to me, so probably to the audience it sounded okay. But playing high unison with woodwinds, this case with first flute, first clarinet and piccolo, is always challenging. I wouldn't change the fingerings I used, but maybe for next time I would ask the mentioned principals play with me so we could all find a common ground for the intonation. I think the dynamic choice is quite good, even if the music has a triple forte, I'm not playing too loud. I believe I gave a color of the top register without overpowering the orchestra, which was what I aimed for.

Over all, I'm glad I did the audio recordings because it gave so much more information about my playing. Sometimes it was a lot easier to analyze afterwards what to do with the technique and what things should I adjust. It also gave me a clearer idea of what to pursue musically, when I could hear the orchestra around me. Next time I would add a microphone also further, maybe into the audience, so I could also have a recording what it sounds to the audience. I think it's easier to analyze my own playing and technical matters from the audio recorded close to me, but sometimes it would also be useful to hear the bigger picture.

I feel like the most important technical differences that are hearable in the orchestra when I switch instruments are found in the airflow, support and intonation. When I paid attention to these aspects in the orchestra, the change between my instruments felt smoother. Also many times if I had a problem or a struggle, checking these three factors was very helpful for me. I believe that the improvement with switching between flute and piccolo comes from practicing the change very attentively and being very aware of what you are doing as a player. Playing both instruments slowly in a practice room and being aware of the intonation, good sound quality and taking care of the embouchure, airflow and support when switching between instruments, will help me improve also in the orchestra. If I am in doubt when playing in an orchestra setting with the instrument change, recording is good tool to use so I can analyze my playing afterwards. Sometimes the music passes by so quickly it might be difficult to analyze what to improve in that moment, or remember afterwards what feeling I had when I was playing. Recordings can give more concrete material to work with.

4 CONCLUSION

Switching between flute and piccolo requires much more than just picking up a smaller flute. It needs knowledge, skills and a lot of adjusting. Doing this quickly in a performance setting, where nerves might kick in, needs a lot of practicing and learning the differences of the two instruments. It is important to remember that my research is based on my own playing and anatomy, so I'm writing from an individual perspective, which cannot be generalized to all players.

There are many factors that make playing a very personal experience such as previous experience, the instrument one plays and individual anatomy. But I believe there are also general aspects that are useful to every player. After doing this research, I would say the most critical aspects in general when switching from flute to piccolo include the embouchure flexibility, air control and intonation. Practicing these elements and finding what works best for you and your instrument makes the smoothest change between the instruments while keeping the musical characters on point. To make the best out of practicing, I would invent different exercises focusing on one technical aspect of playing at the time, and then play it on both instruments after each other. First slowly, exploring and always listening carefully.

In my own playing and working with Stravinsky's *Firebird Suite*, I noticed how quickly I need to make these changes sometimes in an orchestra. So the importance of conscious practice gets highlighted. The better I had practiced all the technics in changing the instruments, the easier and stress-free it was to do it in orchestra. I also noticed that sometimes thinking more about the musical characters and musicality was more helpful to create what I want on the instrument, rather than thinking all the technical thing I should do. Next time when I play an orchestra part where I change between flute and piccolo, I will first think about the music and what sounds or characters I want to achieve, and then add the technicality of how to do it on the instruments. In the end, the music is always the goal and matters the most.

This research has deepened my knowledge and skills on the piccolo and I am much more aware now of all the things I'm doing when playing or switching between instruments. I know how to respond to challenges faster and I have much more tools and tips how to improve my playing on the spot. I believe my thesis shows that flute and piccolo cannot be treated as the same instrument. They differ not only in size and material but in sound production, embouchure, articulation and

overall playing technique. Switching between flute and piccolo requires knowledge of the differences between the instruments and their characters, especially when playing on a professional level. I believe that my thesis shows that mastering both of these instruments means learning the different approaches that each instrument needs. Although this thesis helped me clarify many aspects of the flute and piccolo playing, I see it as one phase of a forever lasting process of playing, learning and exploring.

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APPENDIX

Sound Recording 1. Stravinsky, *The Firebird, 1b. Prelude and Dance of the Firebird, 1c. Variations (Firebird),* rehearsal numbers 6-19, flute2/piccolo. 1c. Variations (Firebird)

Sound Recording 2. Stravinsky, *The Firebird, 7. Rondo (Khorovod),* rehearsal numbers 81-86, flute2/piccolo. 7. Rondo (Khorovod)

Sound Recording 3. Stravinsky, *The Firebird, 10. Final Hymn,* rehearsal numbers 163-166, flute2/piccolo. 10. Final Hymn