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Artistic Research Report

Student name: Belén Ruiz Vega

Main subject: Cello
Main subject teacher: Herre Jan Stegenga

Research domain: Performance Practice
Research coach: Bárbara Varassi Pega

Title of the research: A new face of the cello

Artistic Research Question: How can I arrange and perform heavy metal songs for cello, applying and expanding my knowledge on the instrument and finding new techniques to match the sonorities typical of these musical languages while capitalizing all the possibilities of the instrument?

Keywords: cello in heavy metal, heavy metal music, cello rock, heavy metal music with classical instruments, heavy metal arrangements.

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1   Abstract

As a cellist, I always enjoyed the classical repertoire but since I started to play this instrument I have tried to reproduce my favourite songs in the cello. Once I developed my cello skills, I started to write transcriptions of the songs played by my favourite bands such as Metallica or Scorpions. Years later, I had the opportunity to spend time researching this topic. So I decided to base my master research on arranging and performing heavy metal songs for cello ensemble.

In order to develop my research, I contacted experts related to this topic either for being in contact with heavy metal and rock or for being a cellist outside of the classical world. I listened to hundreds of songs and versions of those songs to take ideas and inspire myself for the arrangements and performances. Finally, I did experiments in order to get different sounds or techniques from other instruments such as slap from the bass or death growls from the singers.

As a result of my research, I did three arrangements from different styles within the heavy metal, heavy metal itself, thrash metal and melodic death metal. Throughout this research, I developed my arrangement and performing skills, starting from a basic arrangement from cellos and drums to three cellos; and ending with an arrangement from a standard heavy metal band with new techniques included, to four cellos.

During this journey, I could improve step by step my skills and show all the progress in the last part of my research combining all the knowledge acquired through the process. As this topic was unexplored, my research could be a base for musicians interested in arranging and performing heavy metal.

With it, I wanted to bring closer the cello to all the people. Nowadays, classical music is losing audience and this new point of view can be a tool to have an impact on a new public. Since the last century, the cello has been included in a lot of popular songs, from The Beatles to Pink Floyd. Bands increased the use of the cello to the moment that ensembles of cellos, such as Apocalyptica or Break of Reality, decided to do something new and bring this instrument to different styles of music and showing the versatility of the cello.

2   Introduction

Since I started to play cello, my dream was to play in a professional orchestra. When I grew up, this dream became more intense due to all the emotions that I have felt when I have played in orchestras. I have been a member of some young orchestras in Spain and nowadays I collaborate with the Chamber Orchestra of Cartagena. Considering that I love to play chamber music, I am involved with chamber music groups from Spain and from Rotterdam. All of the ensembles have made me grow in both directions, personal and musical. At this moment I am also a member of Cloud Orchestra in which we play original string arrangements for singers who want a string background in their songs.

However, two years ago, I applied to play with a folk/rock group and I remember it with the same enthusiasm and illusion as waiting for the result for an orchestra audition. So, being part of a group of this style of music is another of my wishes due to the fact that I would have the opportunity to bring the cello closer to people that either do not listen to classical music or people that do not know about this instrument.

At the end of my Bachelor degree, for my thesis, I decided to research about cello in rock music, this project showed me how the cello was used over the years, not only in rock music, but in a wide variety of genres since the 50's, such as: pop music and progressive rock. My main problem doing this research was the lack of information due to the fact that rock music or heavy metal, with the usage of cello, has been recently introduced in the music field. Therefore, the main sources of information were based on videos, CDs or opinions from people who play this style of music. Even though it was extremely difficult to find books that provided information about this topic, media resources were suitable enough.

The data gathered from my bachelor thesis triggered my curiosity regarding this topic. However, I was only able to explore it on a theoretical level. Therefore, throughout my master research I investigated techniques to aid me in playing this style of music using the knowledge acquired both in my previous thesis and during this research.

Throughout this research, I have learnt how to arrange for a cello ensemble and perform heavy metal. Furthermore, I believe that the knowledge that I gathered would allow me to increase my repertoire, translating into a wider range of variety in my performances. Also, it could help other musicians to arrange from other instruments, finding new techniques or adapting them from the original instrument. I could have achieved this goal playing alone, but the best result was playing alongside more cellos. The reason behind this is the fact that along with other instruments in this style of music, it is possible to reach a more compact and complete sound than playing only one cello. Therefore, with the data gathered from this research I obtained the knowledge regarding the main roles in a heavy metal song and how to obtain its different sounds.

I have divided my research in three cycles taking into account different styles within heavy metal. In the first cycle, I started with a pure heavy metal song. Heavy metal is characterized by strong and distortion guitars, electric bass and drums thicker than in rock music, emphatic beats and long solos.

Then, in the second cycle, I moved into the heavy metal subgenre, thrash metal. The differences with heavy metal are faster tempo, louder electric bass and advanced technicality guitar solos. Finally, in the

third intervention cycle I conclude with the subgenre, melodic death metal. This subgenre keeps the characteristics from the death metal, such as death growls in the voice, double-bass blast beats in drums and excessive use of distortion in guitars. But it also adds melodic elements like guitar riffs or chorus.

Having said that, with the increase in demand for this genre, I was able to find research related to it. The research by Ana María Arango Mantilla (2018), "Propuesta metodológica para la inclusión del rock en la enseñanza del violonchelo" [methodological proposal for the inclusion of rock in the teaching of cello] proposed some exercises based on the classic music technique applied to this genre and other exercises taken from actual techniques of instruments involved in rock.

I also found useful research by Néstor Lasala Barcelona (2019), "The language of the electric guitar interpreted on a violin". In this research, Lasala Barcelona's goal was to reproduce the electric guitar sound, in this case the sound from Paul Gilbert, on his violin without the use of electronic devices.

Research Question:

How can I arrange and perform heavy metal songs for cello, applying and expanding my knowledge on the instrument and finding new techniques to match the sonorities typical of these musical languages while capitalizing all the possibilities of the instrument?

My objective with this research was to be able to perform heavy metal and to achieve this, get a good knowledge in transcribing. I would like to show that it is possible to use this instrument from a Bach Suite to the *Thunderstruck* by AC/DC, displaying a wide range of possibilities that might be unknown by the general public. An example of this was the concert done in 2014 during the festival Cello Biënnale, in Amsterdam where Giovanni Sollima, Mischa Maisky and the group 2Cellos performed classical music and the already mentioned, *Thunderstruck* by AC/DC.

Finally, this research is aimed at musicians who want to include heavy metal in their performances and they do not know how to start arranging or finding techniques to get similar sounds without using electronic effects. Due to this topic is not very known, my research could provide a guide to introduce people in arranging and performing heavy metal.

3   Research findings

3.1 Presentation of the artistic result

The link below is a video of the final result of my research. There I show a recording of my last arrangement for four cellos of *War Eternal* by the Swedish melodic death metal band Arch Enemy. The song is the third from the album *War Eternal* released in 2014. The video was recorded on April 9th, 2020 in Rotterdam. The length of the recording is 2:48. The four cellos were performed by myself.

https://cutt.ly/btZuYF4

Figure 1: excerpt of the arrangement[1] *War Eternal* by Arch Enemy.

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[1] See appendix 5 for the full arrangement.

3.2 Documentation of the artistic result

During this research, I acquired the knowledge to write and perform an arrangement for four cellos of a heavy metal song, in this case, *War Eternal* by Arch Enemy. The reason behind this election was the line of the subgenres chosen through the research. I wanted to show the versatility of the cello and that is why I started with a light piece, such as *Quutamo*, before moving into the deep and strong death metal.

Throughout the different intervention cycles, I worked on how to achieve a song complete in harmony, rhythm and sound in heavy metal style without the use of drums or electronic devices. The idea to avoid electronic devices came from the intention to obtain the sound from the cello itself and make accessible the combination of classical music with heavy metal in the same performance.

After my first intervention cycle, I realised that to reach that goal I needed to cover at least three main roles. They were the rhythmical line, harmonic line and the main melody. Subsequently, with this insight, I combined them and added new lines such as second voices, providing the arrangement more direction and making it more compact.

In order to get the rhythmical role, I analysed the rhythmical lines of the song and combined them with the harmony. Below, I show an example of a drums analysis from my second intervention cycle and how I moved it into the cello voice.

Figure 2: Rhythm transcription from drum to cello 3. *Afterlife* by Avenged Sevenfold.

Once I analysed the songs chosen, I realised that frequently some instruments were playing unison or octaves. This was not a problem for amplified instruments as they were using electronic effects resulting in a final sound that was not empty or poor. When I transcribed those voices and I played on the cello I decided to arrange them in order to get a fuller sound. For that, I harmonized those unison lines or I wrote a second voice.

Figure 3: octave/unison line solved. Arrangement *War Eternal* by Arch Enemy.

Finally, I did a few experiments to achieve a specific sound or technique. As I said before, the arrangements were done from electric instruments, percussion or singers; instruments completely different from a classical cello. Due to this fact, I experimented with my cello in order to get a similar result within the cello possibilities. Sometimes I could obtain a similar sound using the same technique as the original instrument, like the slap technique from the bass. However, other techniques were impossible to reproduce in the cello because of the clear differences between both instruments, like in death growls from singers. For more detailed information about slap, slide or death growls experiments, see second and third intervention cycle.

3.3 Development of the Artistic Result

The third intervention cycle of my research shows the knowledge acquired during this process. In my last arrangement, I showed not only my improvement in arranging but also my skills to bring techniques from other instruments to the cello through experiments and the capitalization of cello's possibilities.

When I compared my last recording with the first one, I could observe a lot of differences and improvements. Before starting this research, I had never done any arrangement, I wrote only transcriptions or adaptations. Once I learnt the difference between arrange and transcribe I understood what I wanted to do during these two years considering that this new knowledge could help me in my performance.

Comparing my first reference recording to my final result I noticed that:

- The rhythmical lines improved a lot from the first recording. Initially, the rhythm lost drive and also was too heavy in some moments but in the last one, I could observe clear differences in the intention of the rhythm.

- The harmony was more complete and rich. I took advantage of having four cellos to enrich the harmony, completing chords and giving more importance to some notes in order to make the final result fuller.

- In my first arrangement, the use of second voices was not effective enough or hindered the main voice. However, in the last one, these voices improved the melody and the phrasing, making a compact sound.

- I learnt how to read a drums line and adapted it to the cello playing.

- I improved my notating skills. In my last arrangement, I showed an accurate notation of articulations.

- Development of my ability to adapt techniques or sounds from other instruments.

- I showed the wide possibilities of the cello.

3.4 Assess and expert feedback

After recording my last arrangement, I sent the video to my network in order to receive feedback. They were Ana María Arango Mantilla, Pablo Sánchez, Job ter Haar, Mr. Marcaille and myself. Here is a summary:

- Keep the sound until the end of the notes.
- The alignment of the voices in the recording can improve.
- More character in medium range.
- Exaggerate even more the articulation.
- Clear beginning of the voices in "question - answer".
- Bar 24 and 74, more presence in cello 3.
- Tuning cello 2 in main theme (bar 33).
- Good improvement.
- Good idea to change the roles between the different voices.
- Continuous rhythm. The rhythmical drive is in general good.
- It sounds full at every moment. Four cellos is a big improvement over three.
- The sound is rough and works really well.
- Good use of textures, solos and special effects.
- New sounds from bar 41 work really good.
- Guitar solo sounds full together with the accompaniment.
- Determination and presence in the playing.
- Sometimes it sounds like a complete band with the advantages of the cello sound.
- To fix the alignment problem, try to increase the volume of some rhythmic parts. It will give some depth and relief.
- Perhaps include more diversity in the rhythmical accompaniment.
- In the future, explore more extended techniques and maybe electronics.

Analysing the feedback I realise the development over the intervention cycles. There were still issues to improve but comparing the comments with the ones received in the beginning of my research, I feel satisfied with my progress (see Appendix 3 for full feedback).

3.5 Conclusion

In the beginning of the master, I decided that I wanted to introduce my love for heavy metal in my education. The reason behind this idea was the objective to do something new with my instrument and to bring the cello to more people. For that, I started to arrange and perform heavy metal songs for cello ensemble.

Once I did the first arrangement, I realised that it was not only to play the main melody and to add harmony and rhythm. I also had to make it work and find a way to get a similar sound and attitude. That was the moment when I started to experiment with new sounds and techniques to achieve a sonority as close as possible to the original adding the advantages of the cello sound.

Even though I feel satisfied with my final result I believe that I can still improve my arranging and performance skills and maybe think about the possibility of adding electronic devices to bring closer the heavy metal sound. However, the objective of this research was to get a similar sound with the cello itself, without electronic devices, and in that way, I am happy with the result.

Thanks to this research I have improved my arranging knowledge and now I want to continue developing my skills. In this line, I could include different instruments in order to get my work to other ensembles. Also, I showed the wide possibilities of the cello and maybe it could influence someone else.

I hope my research can provide other musicians with the aid to create and perform arrangements for any instruments and to inspire them to choose new and daring topics. Also, I would like to bring closer the cello to more people and renew the view of the classical instruments.

4 Documentation of the intervention cycles

4.1 First intervention cycle

4.1.1 Overview of first intervention cycle

In my first intervention cycle, I decided to start with the main genre and record an excerpt from a heavy metal song. Heavy metal is characterized by strong and distorted guitars, electric bass and drums thicker than in rock music, emphatic beats and long solos.

The idea of this intervention cycle was to record the piece as it was written in the score, fix the main problems (tuning, rhythm, articulation, phrasing, etc) and find a way to get a similar sound of electronic devices without the use of them. Moreover, with this intervention, I had my first real experience playing heavy metal music with the cello.

4.1.2 Reference recording

In this case, I have used for my reference recording an excerpt of a piece from the Finnish cello metal band Apocalyptica. The name of the piece is *Quutamo*. It is the second song of the album *Apocalyptica* that the group released in 2005.

The recording was made on November 6th, 2018 in Rotterdam, the length of the recording is 1:25. It was performed by myself. The link of the recording is below:
https://youtu.be/ykPCXaAQBSg

The reason behind my choice for this piece was that in the original song it was possible to listen clearly to several electronic effects and considering that I was new in this field, the sounds had to be clear to help with my comprehension. In addition, there were some versions of this piece that would allow me to gain insights that could be used for my own performance.

4.1.3 Reflect & assess

In order to assess my reference recording, I asked different musicians for feedback. They were the double bass player Silvia Gallego, the cellist Laura Gónzalez Badenes and myself. In the table below it is possible to see a summary of the most important feedback, grouped in main categories:

TUNING	ARTICULATION	PHRASING	RHYTHM	TECHNIQUE	STYLE
Cello 1 bar 10, 16, 17, 27 and 31.	Motif bar 1 and 2, slur per bar.	Cello 1, bar 3 to 10 long phrase.	Cello 2, motif bar 1 and 2, is not regular.	Cello 1, main theme, intense and big vibrato.	Main theme more melancholic.
Cello 2, bar 21 with cello 1.	Cello 2, soft left hand articulation motif bar 1 and 2.	Cello 1, main theme less fragmented.	Cello 3, keep the sixteenths.	Cello 1, use 2nd string.	Cello 2, motif bar 1 and 2, near the bridge.
Cello 2, fifths out of tune.	Cello 3, soft bow articulation	Cello 3, stand out harmonic changes.			Cello 3, play closer rock style.
					Compact sound between the 3 cellos.

After analysing this chart, I was able to deduce that the main issue, besides tuning problems, the piece was played very softly without strong articulation or enough strength. The melody should be played closing every phrase and the lines had to be played less fragmented by making long phrases. Additionally, I should take into consideration the balance between the three cellos in each part of the piece (see appendix 3 for the full feedback).

4.1.4 Data collection

For the first intervention cycle I used the following strategies: desk research, parametric experiment and interview.

- Desk research.
  - Recording analysis and transcriptions.
    I have analysed three different recordings of the same piece.
    - *Quutamo*[2]
    - *How far*[3]
    - https://youtu.be/KZAonkA-M_0 acoustic version of *Quutamo*.

    The reason behind the choice of these three versions was the fact that even being the same they were substantially different. The first option is the original version and it is only instrumental. In the second, a singer is added (the vocalist Marta Jandova), this voice makes a melody similar to the first cello but with a few rhythmical variations. Lastly, the third one is an acoustic version of the piece in which we can find both rhythmic and melodic variations.

    Firstly, I did the transcriptions from the three options (excerpt of the transcriptions Appendix 5) to understand the different variations of the voices from the singer and other instruments. This

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[2] Apocalyptica (2005). Apocalyptica. (CD). Finland: Universal Music Germany/Vertigo.
[3] Apocalyptica (2005). Apocalyptica (CD). Finland: Universal Music Germany/Vertigo.

allowed me to conduct an analysis in order to create my own version choosing the elements that worked better with the cello and its possibilities.

- ○ Literature research
  I read the article by David Neubert (1982) "Electronic Bowed String Works: Some Observations on Trends and Developments in the Instrumental/Electronic Medium".[4]
  In this article it was possible to find information about different ways to produce electronic sounds. David Neubert highlighted the differences in producing electronic sounds classifying them according to the string instrument (violin, viola, cello or double bass) and the electronic process involved.

  About the electronic process, it were discussed three different types:
  - With tape: this form was the most used in live performance due to the fact that it was only necessary a tape recorder, an amplifier and a loudspeaker system.
  - With electronics: this category required a specific equipment, such as contact pickup and modular synthesizer system.
  - Studio processed: lastly, in the final category, the sound was processed in a recording studio but this method did not present challenges when used for live performance due to the necessity of specific sound materials that are commonly used on a studio.

  In conclusion, even though Neubert presented valuable information about the topic, the article was from 1982, therefore it was safe to conclude that it was outdated due to the fast developments of the electronic industry. Due to this fact, I decided to update my knowledge by interviewing some experts in electronic devices such as Bence Huszar (full interview in Appendix 4).

  Further, another work that I used throughout my data collection was the research by Ana María Arango Mantilla (2018) "Propuesta metodológica para la inclusión del rock en la enseñanza del violonchelo"[5] [methodological proposal for the inclusion of rock in the teaching of cello]. In Arango Mantilla's research was presented information regarding the history of rock 'n' roll and practice exercises that were aimed to improve the classical cello technique and consequently allowing it to be applied in rock music.

- ○ Websites
  The main website that I consulted was YouTube because within the platform it was possible to watch several videos, allowing me to compare and learn from the different music and groups. Secondly, it was essential for learning how to work with Sibelius, considering my lack of knowledge on that regard, Youtube contained several tutorials about how to introduce the percussion line.

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[4] David Neubert, "Electronic Bowed String Works: Some Observations on Trends and Developments in the Instrumental/Electronic Medium," *Perspectives of New Music 21*(1/2) (1982): pp. 540-566. doi:10.2307/832892.
[5] Ana María Arango Mantilla, "Propuesta Metodológica para la Inclusión del Rock en la Enseñanza del Violonchelo" (Bachelor thesis, Universidad Nacional de Bogotá, 2018).

Also, I visited the official homepage of Apocalyptica due to the vast range of information regarding how they work, scores, tours, CDs, etc. In this case, I used the website to listen to the songs and the different sounds they got with the cellos.

- Parametric experiment.

In this phase, I assessed the possibilities to obtain electronic sounds using different approaches to apply my classical technique (right and left hand) in order to avoid the usage of electronic devices.

In order to achieve that, I considered using four parameters to obtain a sound similar to Overdrive: bow speed, bow pressure, distance to the bridge and vibrato. However, after analysing the original piece, most of the distortion parts were in fast excerpts (in sixteenth notes), therefore I considered unnecessary the fourth parameter (vibrato). Due to that, I concluded that it would be more suitable to use three parameters instead of four. This was developed in depth in analysis of the data section.

- Interview.

For this intervention cycle, I have interviewed Pablo Sánchez. He is a guitar player and he works in Estudio Uno in Madrid with rock groups.

In our meeting, we talked about the versatility of classical instruments, amplifiers and pedal effects. Before our conversation I did not know how the sound was processed. He showed me how the signal is taken, amplified and pedal effects are applied before recording. Also, I learnt that any amplifier is valid for a cello.

Sánchez thought that playing different styles of music could bring us closer to the creativity due to each noise, knock or effect could be processed and in this way we got different textures for our performance (full interview in Appendix 4).

Analysis of the data.

Once I finished the transcription of the original piece (excerpt of the transcription Appendix 5), I transcribed the other two versions of *Quutamo*.

How far (excerpt of the transcription Appendix 5) was the first version I started. In this song, I found small differences in the second cello, parts where it had a rhythmic line like the third cello, but nothing remarkable. The bigger change appeared in the singer's voice. When I compared this principal line with the first cello, I found a lot of differences: passing tones, ending phrases, shorter notes, rhythm changes and new parts. Here I show some of those differences.

Figure 4: Rhythm changes. *How far* by Apocalyptica and Marta Jandova.

Figure 5: Shorter notes. *How far* by Apocalyptica and Marta Jandova.

Figure 6: New parts. *How fa*r by Apocalyptica and Marta Jandova.

I assumed some of these rhythm changes were made to fit the lyrics with the music and because of the phrasing of the singer. The shorter notes were made to let the singer breath for the next phrase.

Another difference with the original piece was that in *Quutamo* the melody in bar 54 was played by the second cello. Nevertheless, in *How far* the line was played by the first cello while the second was doing a rhythmic motive.

Figure 7: Voice change. *How far* by Apocalyptica and Marta Jandova

In the next transcription, the acoustic one (excerpt of the transcription Appendix 5), I found more differences than in *How far*. Unlike the original piece, this version did not use electronic effects.

Also, the third cello did not play double stops and sometimes it did whole notes and quarter notes instead of sixteenth notes because there was no need to get an overload sound.

Figure 8: Rhythm variation. *Quutamo acoustic* by Apocalyptica.

As opposed to the original version, the second cello kept the rhythm (in sixteenth notes) when the third cello started to play long notes. Thus, the third cello was the harmonic base and it created a continuous and relaxed sound.

Like in *How far*, the first cello played the melody in bar 54 and the second cello did the same rhythmic motive. Due to the fact that there were no electronic effects, the cellos had to achieve more sounds with the cello itself, so in some moments they changed the slurs to play comfortably. Besides, they applied other resources as artificial harmonics in order to create different atmospheres.

Figure 9: Slur variation. *Quutamo acoustic* by Apocalyptica.

Figure 10: Artificial harmonics. *Quutamo acoustic* by Apocalyptica.

One of the biggest variations of this version was the drums line. In *Quutamo* the drums are played with a double bass pedal and overload sound. However, in the acoustic version this instrument used more snare drum than bass drum, together with the use of brushes instead of drumsticks, giving the piece a calm sound.
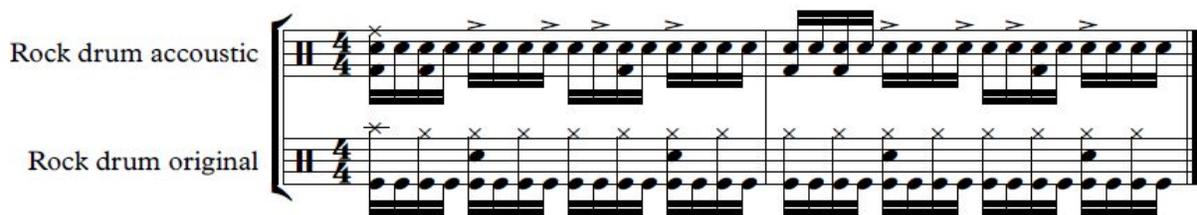
Figure 11: Drums differences. *Quutamo acoustic* by Apocalyptica.

After the analysis of the three versions, I realised that in two of them they used a lot of electronic sounds, especially overdrive and phaser. Overdrive is a pedal that distorts the sound of the instrument through an amplifier in a smooth way. Phaser is a pedal that modulates the sound signal, it is altered when the phase is reversed and it is delayed a few milliseconds, creating a sweeping effect.

In this intervention cycle, I worked on the overdrive effect doing a parametric experiment to get this sound without using electronic devices. For that, I made a chart with the parameters that I used in the experiment.

Bow speed	Bow pressure	Distance to the bridge
Slow	Light	On the bridge
Medium	Medium	Near the bridge
Fast	Heavy	Middle

From this chart I obtained 27 different combinations and easily I discarded some of them because I did not get the result needed. Like for example, when I played in the middle distance to the bridge the sound was not distorted enough or playing with light pressure and fast bow it was less precise.

After experimenting with all the options, I chose these two combinations.

- https://youtu.be/r_smyrcWlDc
  Bow speed: slow.
  Bow pressure: medium.
  Distance to the bridge: near the bridge.
- https://youtu.be/qBiY2P2lXKM
  Bow speed: slow.
  Bow pressure: light.
  Distance to the bridge: on the bridge.

Depending on the quantity of distortion I wanted to achieve, it was possible to use the first option or the second. The first one gave more precise sound while the second option was more metallic. In the next section I show the conclusion of the experiment.

4.1.5 Intervention

Once I did the experiment, I could reproduce a similar overdrive sound without using electronic devices and this was the most representative effect of the original piece. In addition, after analysing the final sound of both recordings from the experiment I decided to use the second option in my next arrangement. giving the piece a calm sound. This way I was able to listen to how this metallic sound blended in together with the rest of the voices.

I used the analysis of the different versions to get final ideas. Since I avoided the electronics, I did not need an overload sound. That meant the third cello, as in the acoustic version, does not play double stops. Also, I kept almost all the long notes in this voice that were played in the acoustic song to get a continuous sound. I included in my final version, as they did in the acoustic version, the usage of the artificial harmonics in the second cello to expand the colors of the piece.

Figure 12: Rhythm. *Quutamo* final version by Apocalyptica.

As I mentioned before, in *How far* the singer changed some rhythms, did different final phrases and sang new melodic lines that did not sound in both *Quutamo* versions. In my opinion, some of those new things sounded more interesting than the original line played by the first cello and I decided to include a few of these variations in my version.

Figure 13: New parts. *Quutamo* final version by Apocalyptica.

The main issue in this piece was to keep the energy and rhythm throughout the whole song so I kept the sixteenth notes during the piece in at least one voice. Also, to maintain this energy, it was important to exaggerate the articulation in all the rhythmic motives.

As I mentioned, both in *How far* and the acoustic version of *Quutamo*, the melody started in bar 54 was played by the first cello, but in my final version this line was moved to the second cello as in the original song, because this way both cellos have enough time to play comfortably.

Finally, for the percussion line, I decided to use the original version over the acoustic. Since the acoustic version was played with brushes and snare drum, it did not give the piece the heavy metal sound that I wanted to achieve. For the new reference, the drums line was not recorded. The reason for this was mainly a lack of time. In the score, I show how it is supposed to be (final score in Appendix 5).

4.1.6 New reference recording, assess and expert feedback

For this second recording, I have used the same piece *Quutamo* but adding the new elements chosen through the data collection.

The recording has been made April 17th 2019, and the length of the recording is 3:24. The link of it is:
https://youtu.be/bKNnpPofeRY

The performers were:
Violoncello 1: Belén Ruiz Vega.
Violoncello 2: Jorge Municio Corcho.
Violoncello 3: Carlos Maldonado.

For this recording I asked for feedback. This time I received it from Silvia Gallego, Laura Gónzalez and myself again. Moreover, Ana María Arango Mantilla also participated. Below I summarised the comments received.

- Rhythm: was not always clear in first and third cello and it was not stable during the piece.
- Tuning: second cello from bar 47 to 53.
- More energy in the third cello.
- Rhythmic accompaniment more staccato.
- More articulation in the first and second cello (motif bar 12-13).
- More vibrato in principal melody.
- Bar 14 between the first and second cello, they were not together.
- More distortion sound in cello 2.
- Good balance.
- A good piece to show the versatility of the instrument in all the registers.

Analysing the main feedback received, I deduced that the major problem was the lack of energy and articulation in some moments. However, some aspects improved, such as the balance between the three cellos and the compact sound (see Appendix 3 for full Feedback).

4.1.7 Reflect on your progress since the first/previous reference recording

During this intervention cycle, I learnt to identify the main necessary roles in a heavy metal song. Even if I decided to add percussion, it was always helpful to keep the energy of the piece counting with a

rhythmical voice. In this case, it was performed by the third cello. When I played the melodic line, it needed to be more intense, soloist and contrasting with the strong rhythm.

On one hand, I did the second recording with an ensemble. It helped me recognize problems and improvements as they occurred. In the reference recording, I played the three cellos individually and after that, they were put together in the same video. This was a problem for the final result due to the fact that I could not hear it until the end of the video edition.

On the other hand, playing with more cellists made me discover an issue with the notation of the score. The musicians with whom I worked did not understand some notations or they played differently than I expected. To solve it I needed to be more precise with the notation.

In conclusion, this style of music should be played with strong articulation and clear rhythmic basis to provide energy to the piece. In addition, an intense vibrato to the melody always helps to simulate the electric sound of the guitars from a heavy metal group.

4.2 Second intervention cycle

For my second intervention cycle, I have done an arrangement from the song *Afterlife* by the American heavy metal band Avenged Sevenfold. This song belongs to thrash metal. It is a subgenre of heavy metal and it is characterized by fast tempo, louder electric bass and advanced technicality guitar solos.

The main difference between this intervention and the first one is the original instrumentation. *Quutamo* was a song written for three cellos and drums, as I did. However, *Afterlife* is for vocals, guitar, bass and drums. Also, this song has a collaboration of a string section in some moments of it.

The idea for this intervention cycle was to be able to adapt a Heavy Metal song for classical instruments, in this case, to three cellos.

The first intervention cycle of this research allowed me the capacity to recognize the main lines of the song and how to perform them, which provided me with the information necessary to apply it in my arrangement and performance of *Afterlife*.

4.2.1 Reference recording

In this intervention cycle I have recorded an arrangement from the song *Afterlife* by the American heavy metal band Avenged Sevenfold, as I mentioned before. This song was the fourth from the album *Avenged Sevenfold* released in 2008.

I chose this song because after my first contact playing heavy metal music I wanted to go deep in this world and make an arrangement for cellos from a subgenre of heavy metal. Taking a standard heavy metal band and then, trying to get a similar result with the cellos.

The recording was made on November 13th, 2019 in Rotterdam, the length of the recording is 3:32. It was performed by Alejandro García, Jorge Municio and myself. The link of the recording is below:
https://youtu.be/imZbSwM4CZ4

4.2.2 Reflect & assess

According to the reference recording, I asked for feedback to people from my network. This time they were Ana María Arango Mantilla, the writer of the research "Propuesta metodológica para la inclusión del rock en la enseñanza del violonchelo". Néstor Lasala Barcelona, the writer of the research "The language of the electric guitar interpreted on a violin" and Job ter Haar, cellist and coach from Codarts.

Generally, I could group the principal feedback in rhythm and style categories but to be more precise, I decided to group them by players and a general category.

CELLO 1	CELLO 2	CELLO 3	GENERAL
More glissandi / slide to imitate the guitar playing.	More sound from bar 40 to 56.	More drums line not only harmonic role.	Keep energy through the whole song.
Bite more some notes.	Play more forte from bar 73 to 79.	Bar 18 experiment other options.	More rhythm elements in the arrangement.
Sometimes be more in Heavy Metal style.		Too heavy sometimes in the rhythm.	Suggestion to add cello 4 for rhythmic variety.
		Try attacks from the wrist instead from arm (variety of sounds).	Sometimes different sense of rhythm in the three players.

After receiving and analysing all the feedback I found three main issues. The third cello, played by myself, was too heavy playing in some moments of the song, especially in the drums rhythms. Also I could add more heavy metal elements in the first cello as slides[6] or just have more heavy metal sound in some moments.

Finally, there was also a lack of rhythm in some moments. Since the third cello was sometimes playing the harmonic base it lacked rhythm. This role could be taken for the second cello, who sometimes had rest bars, or I could combine the harmonic base with the rhythm in the third cello (see appendix 3 for the full feedback).

4.2.3 Data Collection

In this second intervention cycle I used the following strategies: desk research, interview and parametric experiment.

- Desk research.
  - Recording analysis and transcriptions.
    I have analysed two different recordings of the same piece.
    - *Afterlife*[7]
    - https://www.youtube.com/watch?v=B-qkJw8q-uA[8]
    Two recordings were chosen, the first one due to being the original, the second as it was a live version. The reason to take a live version was to listen to rhythms or lines hard to recognize in the original version due to corrections and sound changes that were made in the studio.

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[6] Slide / bottleneck technique: playing one note and then sliding the finger to another fret together with a fast vibrato. Doing this we get a glissando effect. Sometimes it is done with an object on the finger (metal or glass).

[7] *Afterlife,* Avenged Sevenfold (2008) Avenged Sevenfold (CD). Warner Bros. Record.

[8] *Afterlife.* Live in the LBC (2011).

After analysing the song, I did the transcription of it and also arranged the final result, considering that the original song was for guitars, electric bass, singer and drums (see Appendix 5 for full arrangement).

To make a proper arrangement I took the guitar tablature to have the harmonic base. Also, thanks to the tablature and my knowledge of the guitar I reasoned that the long solo played by the guitar was almost impossible to play in a cello due to the technique differences of both instruments, so I decided to skip it.

Figure 14: Excerpt of the first arrangement. *Afterlife* by Avenged Sevenfold.

- ○ Literature.

  I read the research by Néstor Lasala Barcelona (2019) "The language of the electric guitar interpreted on a violin"[9]. In this research he explains how to achieve an electric guitar sound (in this case Paul Gilbert's sound) on a violin trying to keep the style and the spirit.

  Lasala Barcelona made an arrangement from *Fuzz Universe* by Paul Gilbert. This song was a piece for solo guitarists with drum and bass doing the accompaniment. Throughout the research, he showed how to get a similar result with only the violin and from the perspective of a classical musician. Thanks to his research I had another point of view about adapting some techniques from the electric guitar that, in some cases, I applied in my performance.

- ○ Website.

  In this intervention cycle, the main website used was YouTube. As I mentioned in the last intervention cycle, on this platform I could consult a lot of videos. This gave me the opportunity to compare different versions, to learn from other musicians or listen to interviews of the musicians themselves. This time, I used it to listen to different versions from *Afterlife* in order to get performing ideas or to get the different voices of the song. I chose the original song and a live version to analyse and this platform gave the opportunity to listen to them as many times as needed.

- ● Interview:

In this intervention cycle I interviewed Mr. Marcaille. He is a French cellist based in Belgium. He plays heavy-hardcore metal with his cello accompaiment with a set of two kick drums played by him as well.
Due to his busy schedule we did the interview by email. We talked about his influences playing the cello, some other musicians making similar things and about his sound, mainly overdrive and fuzz achieved by an amplifier.

Also, I had a meeting with Bence Huszar. He is a cellist who plays with electronics in his cello. In our meeting we discussed the sound differences between using an analogue signal or a digital one. With the analogue signal the cello sound is more natural but with the digital signal it is easier to track. So depending on the sound preferred he chose one or the other.

My final interview was with Néstor Lasala Barcelona. He recommended me to listen to each instrument and to try to imitate its sound or at least its character. In addition, we discussed the different ways to get some sounds such as playing close to the bridge or different bowings (full interviews in Appendix 4).

- ● Experiment:

At this point, I explored how to get the slap sound on the cello taking into account the tempo of the song. The slap is principally a bass technique. It consists of hitting the string with the bony part of the thumb until it strikes against the fingerboard.
Due to the speed of this piece I experimented with diverse ways to achieve a similar sound using different cello techniques, such as pizzicato, col legno and with the original (with the bony part of the thumb).
This experiment is developed in depth in the analysis of the data paragraph (here below).

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[9] Néstor Lasala Barcelona, "The language of the electric guitar interpreted on a violin" (Master thesis, Fontys School of the Arts of Tilburg, 2019)

Analysis of the data

Once I analysed the original song and I did the transcription of it, I started to arrange it for cello. The original song was composed for voice, electric guitar, electric bass and drums; so I had to arrange the song for the cello playing.

Some of those arrangements were related to the absence of drums or with the difference between playing an electric guitar and a cello. The guitar could reproduce chords that provide the music the harmony together with the bass. As a result of the drums analysis, I could combine the harmonic base with the drums rhythm.

Figure 15: Rhythm transcription from drums to cello 3. *Afterlife* by Avenged Sevenfold.

Based on that, some parts of the first transcription were adapted and combined. Another moment that was changed to give more direction and energy to the motive from bar 36 to bar 40. Since the second cello was not playing, I wrote the line played by the guitar in the original song. So, at that moment I had the drum rhythm and harmonic base on the third cello, a line to support the intention and direction in the second cello and the melody in the first one. Thus, I got all the performance ranges covered.

Figure 16: Rhythm line cello 2 to help the direction. *Afterlife* by Avenged Sevenfold.

In order to obtain a sound similar to some effects from the electric guitar, I adapted them to cello. The slide or bottleneck is mainly a guitar technique. In heavy metal almost all the guitar shifts are made by glissando or slide. It consists of playing one note and then sliding the finger to another fret together with a fast vibrato. Doing this we get a glissando effect. Sometimes it is done with an object on the finger (metal or glass).

Figure 17: slide effect cello 1. *Afterlife* by Avenged Sevenfold.

I used the symbol ⌐ to let the player know that he has to play a slide. The difference with a glissando is the length of the finger shift. In a glissando the shift is from one note to the next one written. In the slide the shift is from one close note to the original and a fast shift. For the glissando I wrote a long line from one note to the next one and in the slide I wrote a line close to the note in which we have to play the slide. As Néstor Lasala Barcelona said in our meeting, some techniques from other instruments have an easy adaptation.

Figure 18: Glissando - slide difference.

In the links below I show an example from both at a slower tempo.
● Slide example: https://youtu.be/JReQXSC3JIo
● Glissando example: https://youtu.be/eOAL9rIsJSM

Finally, I did an experiment to try to imitate the slap technique. In bar 18 the electric bass played a motiv with slap technique and this role was performed by the third cello. In that bar, this cello was playing a rhythmical line with bow and there was not enough time to change from bow to the slap technique.

Figure 19: Slap bar. *Afterlife* by Avenged Sevenfold.

To imitate the slap, I chose three different cello techniques: short and heavy bow, pizzicato and col legno; taking into account that the bow had to stay in the right hand during the process because there was no time to leave the bow.
● Slap (original): https://youtu.be/b_rU0ghehtE
  Easy to adapt this technique to the cello. But to do it properly, better without the bow in the right hand.
● Short and heavy bow: https://youtu.be/TBb52gcvUnQ
  Good results, maybe there was a lack of resonance.

- Pizzicato: https://youtu.be/3FGVaSWyvrE
  In slow motion the result is good but once I played it in the original tempo, it was not too precise.
- Col legno: https://youtu.be/Qf4kNjPJ9Ek
  Good option, the sound was similar.

4.2.4 Intervention

Once I analysed and experimented with the song and thanks to all the feedback received, I improved my performance of the arrangement of *Afterlife*. First of all, I added more rhythmic elements in order to give to the music drive and direction and also cover the drums absence. Thus, we get a complete arrangement not only harmonically but also rhythmically.

After doing my experiment about the slap technique, I decided that the short and heavy bow could work but there was no resonance on it, so I discarded the idea together with the pizzicato option due to it not being precise enough in the original tempo.

The option col legno was the most similar because it strikes with the wooden part of the bow and the sound is close to the slap. However, I decided to combine cello 2 and cello 3 in bar 18 giving more time to the third cello to leave the bow and play with slap technique. This final decision was taken since although playing col legno was very similar, we couldn't hear clearly the tune and harmony.

Figure 20: Slap technique. *Afterlife* final version by Avenged Sevenfold.

Once I received all the feedback, I could observe that most of the comments had in common that in some parts it sounded too heavy and we lost tempo. The best way to fix this problem is to think forward and articulate the rhythmic parts. Also, I analysed again some parts of the original song and I added new rhythms, helping to keep the tempo and the direction of the song.
Some rhythmic parts (mainly in the third cello) needed to be played more precisely and less heavily due to sometimes those lines were not only giving harmony but also imitating the drum.

Figure 21: Example harmony - drums rhythm in third cello. *Afterlife* final version by Avenged Sevenfold.

In addition, I had to be more precise with the notation in the score. In this case, two from the three players did not know the original song so they did not know how it had to sound. As I was also performing the arrangement, I could notice that problem and change the notation in order to let them know. The way to fix this issue is to write everything I consider important for a proper interpretation. Due to my performing skills, I could decide the correct notation depending on the sound I want to achieve, trying different bow attacks or using different cello techniques (see Appendix 5 for full arrangement).

Figure 22: notation example. *Afterlife* final version by Avenged Sevenfold.

4.2.5 New reference recording, assess and expert feedback

For this second recording of *Afterlife* by Avenged Sevenfold I used the new arrangement done after all the knowledge acquired and all the feedback received throughout the second intervention cycle.

The recording has been made November 22nd 2019, and the length of the recording is 4:02. The link of it is:
https://youtu.be/9djWbiHbk3M

This time the performers have been the same as in the reference recording due to we already worked together on this arrangement:

Violoncello 1 - Ale García
Violoncello 2 - Jorge Municio
Violoncello 3 - Belén Ruiz

For this recording I received feedback from the same people of the reference recording at the beginning of this intervention cycle, Ana Maria Arango Mantilla, Néstor Lasala Barcelona and Job ter Haar. Also, I asked for feedback to Mr. Marcaille, a heavy hard punk cellist from Belgium. Below there is a summary of the main feedback (see Appendix 3 for full feedback).

- Good improvement of the rhythmic parts.
- Cello 3 still lost the drive from bar 40.
- Same artitulation in cello 1 and 2 from bar 4.
- Make more difference between introduction/verses and chorus
    - Introduction/verses: more aggressive, close to the bridge, even dragging.
    - Chorus: more melodic, singed.
- The sound was more rough in general, more into style.
- Good distribution of the voices in the chorus part. Good balance.
- As they were classical instruments, exaggerate everything: articulation, vibrato (cried sometimes)…
- Cello 1: more glissando/slide in chorus also. Change the articulation in some moments. Be more rough.
- Cello 2: perfect melody bar 57.
- Cadenza bar 90: more drive, go forward.
- Suggestion to try the beginning (or other material) without vibrato. The continuous vibrato makes it a bit "civilized".
- Arrangement is complete and well harmonized.
- It has attitude, strength, power...

4.2.6 Reflect on your progress since the first/previous reference recording

Already at the beginning of this second intervention cycle, I noticed how much I had improved on my topic but even more so after each day working on it. I finished the first intervention cycle knowing the important roles that have to exist in a heavy metal song: melodic line, harmonic line and rhythm line. Also, during this intervention I have learnt how to use each voice and how to combine them in order to create a complete arrangement.

I decided to do it without drums because I wanted to try to achieve the energy and rhythm with the cello itself. Even though the first recording was rhythmical enough, thanks to the feedback received I realised that I could write more rhythmic elements in silent moments or combine others. Those new changes to my arrangement made the song sound with more direction and life.

Finally, I still needed to learn how to write the arrangement properly in order to let the player know how I want some articulations or effects considering that not everyone knows all the original songs. In addition, I have to work with the rest of the musicians in order to get the performance closer to the style that I want.

4.3 Third intervention cycle

In my third intervention cycle, I have arranged the song *War Eternal* by the Swedish melodic death metal band Arch Enemy. Melodic death metal subgenre keeps the characteristics from the death metal, such as death growls[10] in the voice, double-bass blast beats in drums and excessive use of distortion in guitars. But it also adds melodic elements like the guitar riffs or chorus. Keeping the idea of the previous intervention cycle, this song is also for standard heavy metal instrumentation: vocals, two guitars, bass and drums.

In the first intervention cycle I did an arrangement from the instrumental heavy metal song, *Quutamo*. After the second intervention cycle, I learnt how to arrange and perform from a standard heavy metal group to cello ensemble, how to combine the drums rhythm with the harmonic base and I tried a subgenre from heavy metal. Now, I wanted to do an arrangement from a heavy and overloaded song in order to show all the knowledge acquired during this research and the cello possibilities.

4.3.1 Reference recording

For my third intervention cycle, I chose as a reference recording the last version of the arrangement *Afterlife* by Avenged Sevenfold.

This recording was made November 22nd 2019, and the length of the recording is 4:02. The link of it is: https://youtu.be/9djWbiHbk3M

The performers of the recordings are:
- Violoncello 1 - Ale García
- Violoncello 2 - Jorge Municio
- Violoncello 3 - Belén Ruiz

I decided to use this recording because taking my last work as a starting point I can show my progress in arranging from heavy metal.

4.3.2 Reflect & assess

Once I sent the video to my network: Ana María Arango, Néstor Lasala Barcelona and Job ter Haar, I received some feedback. Below I selected the "negative" feedback in order to improve for the new arrangement.

- Cello 3 still lost the drive from bar 40.
- Same artitulation in cello 1 and 2 from bar 4.
- Make more different between introduction/verses and chorus
  - Introduction/verses: more aggressive, close to the bridge, even dragging.
  - Chorus: more melodic, singed.
- As they are classical instruments we have to exaggerate everything: articulation, vibrato (cried sometimes)…

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[10] Death growls: vocal technique used in death metal and other heavy metal styles. It consists in really high and agonizing singing or more commonly, in a low, overload and sometimes unintelligible voice.

- Cello 1: need more glissando/slide in chorus also. Change the articulation in some moments. Be more rough.
- Cadenza bar 90: more drive, go forward.
- Suggestion to try the beginning (or other material) without vibrato. The continuous vibrato makes it a bit "civilized".
- Suggestion to add a fourth cello

4.3.3 Data Collection

For this last intervention cycle I used the following strategies: desk research and re-enactment.

- Desk research.
  - Recording analysis and transcription.
    I analysed two recordings from *War eternal*
      - *Wat Eternal[11]*
      - https://youtu.be/7TPUZEOxRb8[12]

    For this intervention cycle, two recordings were chosen, the first one due to being the original, the second as it was a live version.. As I said previously, in the live version I could easily hear some parts that were more difficult to recognise in the studio due to the possibility to correct or add effects in recordings.

    Once I analysed both recordings, I did the transcription of it and also arranged it for four cellos. Unlike *Afterlife* (second intervention cycle), this song not only had double-bass blast beats in drums during the whole piece but also the rhythmic guitar and the bass played almost the same motif. Considering this aspect is really tiring to be performed only by one cello, I switched the rhythmical voice between three cellos during the song (see Appendix 5 for the full arrangement).

  - Websites.
    As in the past intervention cycles, YouTube was again my main website together with the official homepage from Arch Enemy. I used both websites as a media resource.
    On the official homepage, I could listen and see recordings from *War Eternal* both the original and live version. Also on YouTube, I could see various live videos from *War Eternal* in order to get different ideas such as for the death growls and for the rhythms. Thanks to this platform I could also get some performative ideas.
    On the other hand, on this platform, I could attend some interviews with the musicians of the band to see what they wanted in some parts of the song.

  - Experiment.
    In order to approach the drums line as close as possible to the original I did an experiment taking an excerpt as an example. First I transcribed a few bars from the original rhythm and then I started with the experiment. I chose three different options: all with staccato, all with accents and combining both staccato and accents. To get my progress clear I did a diary in which I wrote the feelings after each attempt. To see the results of the experiment, go to the next section (analysis of the data).

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[11] *War Eternal,* Arch Enemy (2014) War Eternal (CD). Century Media Records.
[12] *War Eternal.* Live in Bloodstock (2017)

Also I did another experiment in order to obtain a similar sound than death growls within the cello possibilities. For this, I listened to a lot of songs with death growls and I saw interviews with death growls singers. By doing this, I could analyse this sound and I realised that the main feature is the low register and the broken sound. So I experimented with the cello in order to get that sound. In analysis of the data I explain in depth this experiment.

Analysis of the data

Once I analysed and I ended the transcription of the original song composed for voice, guitar, electric bass and drums. I started to arrange it for a cello ensemble due to the possibilities and techniques are completely different.

Even though this time I wrote the arrangement for four cellos and it made the arrangement more complete and compact, I continued with the idea of no drums. Instead, I utilised the inclusion of the fourth cello, in combination with the others, to take up the rhythm of this instrument. First, I analysed the drums voice of the original song and I transcribed this line. Then, I compiled the results of my experiment in order to analyse them and achieve a closer sound to a drums:

- 1st attempt: all with staccato.
  - The staccato matched with the sound obtained playing the drums with a stick in the snare drum. However, there was a lake of drive and sense of the strong beat. No difference in what should be the bass drum or cymbal sound.
- 2nd attempt: all with accents.
  - The final sound was too heavy and lost tempo. Lost of character.
- 3rd attempt: combine accents in the strong beat and staccato in the rest.
  - Perfect to get the strong beat and cymbal sound with accent. The staccato helped in the snare drum final sound.

Figure 23: example drums rhythm. Arrangement *War Eternal* by Arch Enemy.

However, after analysing and transcribing the original song, I found a lot of unison and octave lines between the lead guitar and the rhythmic guitar or between the rhythmic guitar and the electric bass. With help of the effects from the electronic devices, it did not sound empty. Once I played it with the cello and without these effects the sound was weak. To solve it, I decided to harmonize them in order to get stronger lines and improve the final performance. This way the sound is more rich in harmonics but also was still loyal to the original version.

Figure 24: transcribed line from the original. *War Eternal* by Arch Enemy.

In this process, I also thought that the rhythmical voice was really tiring to be played by one cellist. After the analysis of the song, I realised that the drums played almost during the whole song double-bass blast beats. Also the rhythmic guitar and bass played sixteenths notes and to this rhythm I had to add the fast tempo of the song. When this role was taken by the same person, after a while, the rhythm lost articulation and energy.

Figure 25: Original rhythm. *War Eternal* by Arch enemy.

Finally, I also did an experiment in order to get the death growls. During the piece, this line sings the same or a similar line to the lead guitar but adding this technique. To reproduce this technique on the cello, I listened to lots of songs in which I could appreciate them and interviews with death growls singers. Then, I analysed the sound of this technique and I realised that it was always in the lower register of the singer and with a broken and overloaded sound. So I started to practice different ways to get that sound with the cello.

As it was in a low register I decided to do it also in the lower register of the cello. To get the broken sound of the voice I tried to do it with overpressure in the bow.

4.3.4 Intervention

As a result of my experiment, once I analysed the drums line through the piece and I combined it with the harmony. I decided that the best option to get a similar sound to a drums was to combine accents and staccato. Based on the experiment, I wrote accents in the strong beats of the bar, when the drums played the hit-hat. To get a closer sound to the snare drum, I kept the staccato notation.

Figure 26: example drums with notation. Arrangement *War Eternal* by Arch Enemy.

After this step, I started to solve the unisons and octaves that made the song without electronic devices empty. For that, I decided to harmonize some of those moments to achieve a better performance result, getting a compact sound and more rich in harmonics. However, I kept a few octave/unison lines such as the beginning in the two cellos who are playing at that moment the low C.

Figure 27: octave/unison line solved. Arrangement *War Eternal* by Arch Enemy.

Regarding keeping the articulation and energy in the rhythmical line during the performance, I decided to move the sixteenths between the different cellos and sometimes change the sixteenths to eight notes in order to control the energy. With these changes the cellos could rest from this tiring rhythm and the energy and articulation of the song kept the same throughout the piece.

Figure 28: rhythm movement. Arrangement *War Eternal* by Arch enemy.

I continued with the second experiment to get a similar sound of the death growls. After analysing recordings with death growls, I realised that they sang it in the lower register so I experimented in the same range with the cello. I tried two options:
- In the lower register of the cello.
- Everything in C string.

Both options were similar to the original but I preferred the final sound that the C string provided. On the other hand, to achieve the broken and overloaded sound of the voice, I figured out that playing with overpressure in the bow I could get a similar tone than the singer. Mixing these two ideas, I could achieve a close death growls with the cello.

Figure 29: example death growls line from the singer. Arrangement *War Eternal* by Arch Enemy

4.3.5 New reference recording, assess and expert feedback

For this new recording I used the new arrangement from the song *War Eternal* by the Swedish melodic death metal band Arch Enemy. The song is the third from the album *War Eternal* released in 2014.

The recording was made on April 9th, 2020 in Rotterdam. The length of the recording is 2:48. The four cellos were performed by myself. The link of the recording is below:
https://cutt.ly/btZuYF4

For this last recording I received feedback from Ana María Arango Mantilla, Pablo Sánchez, Job ter Haar, Mr. Marcaille and myself. The main comments received were:

- Keep the sound until the end of the notes.
- The alignment of the voices in the recording can improve.
- More character in medium range.
- Exaggerate even more the articulation.
- Clear beginning of the voices in "question - answer".
- Bar 24 and 74, more presence in cello 3.
- Tuning cello 2 in main theme (bar 33).
- Good improvement.
- Good idea to change the roles between the different voices.
- Continuous rhythm. The rhythmical drive is in general good.
- It sounds full at every moment. Four cellos is a big improvement over three.
- The sound is rough and works really well.
- Good use of textures, solos and special effects.
- New sounds from bar 41 work really good.
- Guitar solo sounds full together with the accompaniment.
- Determination and presence in the playing.
- Sometimes it sounds like a complete band with the advantages of the cello sound.
- To fix the alignment problem, try to increase the volume of some rhythmic parts. It will give some depth and relief.
- Perhaps include more diversity in the rhythmical accompaniment.
- In the future, explore more extended techniques and maybe electronics.

(See Appendix 3 for full feedback).

4.3.6 Reflect on your progress since the first/previous reference recording

Since the beginning of this intervention cycle I noticed a change in the way I work. The analysis and the transcription were faster, I recognised melodies or rhythm quickly. When I started the arrangement, even if I needed more time for this part, I found an easy solution for adapting techniques or moving lines between the cellos.

In this last recording I had to play all the voices by myself.i It was challenging because I had no previous knowledge with computer programs. The final experience and result were better than expected. I was the responsible to put the passion and the character on the performance and I could hear that in the recording.
Comparing my last recording with the first *Quutamo* version, I felt my goal has been achieved. I not only did a heavy metal arrangement but also I got a strong performance with the cello itself. The character of the piece was there from the beginning. The rhythm was continuous and going forward during the whole song. The solo was passionate, feeling the climax and I used textures that provided the music with different colours.

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  - Interview to Peter Gregson http://www.musicroom.com/blog/peter-gregson (last accessed 10/01/2019)
  - *Quutamo* acoustic by Apocalyptica https://youtu.be/KZAonkA-M_0 (last accessed 15/04/2019).
  - *Quutamo* by Apocalyptica https://youtu.be/tatXkz93O50 (last accessed 15/04/2019).
  - Sibelius tutorial https://youtu.be/tRSXVuT7rZE (last accessed 2/04/2019).
  - Sibelius tutorial https://youtu.be/9dNFRHK8ao0 (last accessed 2/04/2019).
  - *Afterlife* by Avenged Sevenfold https://youtu.be/HIRNdveLnJI (last accessed 1/11/2019).
  - *Afterlife* live by Avenged Sevenfold https://youtu.be/B-qkJw8q-uA (last accessed 1/11/2019).
  - *Afterlife* making video by Avenged Sevenfold https://youtu.be/FA8lZ3KIQ5Q (last accessed 12/11/2019).
  - *War eternal* by Arch Enemy https://youtu.be/InRMwptcgAo (last accessed 6/2/2020).
  - Arch Enemy interview https://youtu.be/8pCpYDxwR5c (last accessed 29/2/2019).
  - *War eternal* live by Arch Enemy https://youtu.be/7TPUZEOxRb8 (last accessed 2/3/2020).
  - Arch Enemy official homepage http://www.archenemy.net/en/ (last accessed 2/3/2020).
  - Alissa White-Gluz by Arch Enemy interview https://youtu.be/ORj1wQuc3b0 (last accessed 3/3/2019).

- CD's

  - Apocalyptica (2005). *Apocalyptica*. Finland: Universal Music Germany/Vertigo.
  - Avenged Sevenfold (2007). *Avenged Sevenfold.* EEUU: Warner Bros. Records.

- ○ Arch Enemy (2014). *War eternal* . Germany: Century Media Records.
- ○ 2cellos (2013). *Live at Arena Zagreb*. (DVD). Zagreb: Sony Masterworks.

6 Network

- Herre Jan Stegenga

Cello teacher in Rotterdam. Currently he plays in the Nederlands Philharmonisch Orkest and in the Nederlands Kamerorkest. Because of his large career he can provide me with a lot of information about the cello and how I can adapt my technique to this music.

- Job ter Haar

Coach from Codarts and cellist. He knows a lot about cello in different styles of music.

- Laura Gónzalez Badenes

Cellist student from Spain. Some years ago she recorded with the cello a song with the rock-ska spanish group Aspencat.

- Silvia Gallego

Double bass player from Spain. Some years ago we used to play together some arrangements of rock songs.

- Pablo Sánchez

Guitar player. He works with all kinds of electronic devices in Estudio Uno in Madrid. There, they work with different types of music (from classical to rock music) and instruments.

- Andrés Navarro García

Percussionist who helped me with the transcriptions of the drums line in the three versions of Quutamo.

- Mr. Marcaille

French cellist based in Belgium who plays Heavy Hard Punk with his cello and a set of kick drums by himself.
- Néstor Lasala Barcelona

Violin player, writer of the research "The language of the electric guitar interpreted on a violin" from the perspective of a classical performer.

- Ana María Arango Mantilla

Cellist from Bogotá, writer of the research "Propuesta metodológica para la inclusión del rock en la enseñanza del violonchelo".

- Bence Huszar

Cellist living in Amsterdam. He is specialized on electronic devices in cello playing.

- Maik Ijpelaar

Pop department student who had contact with heavy metal. He helped me with the final arrangement and feedback.

Appendices

Appendix 1: List of all recordings included in report

01 Reference Recording 01 https://youtu.be/ykPCXaAQBSg
02 Recording 01 https://youtu.be/bKNnpPofeRY
03 Overload sound effect 1 https://youtu.be/r_smyrcWlDc
04 Overload sound effect 2 https://youtu.be/qBiY2P2lXKM
05 Reference Recording 02 https://youtu.be/imZbSwM4CZ4
06 Slide example https://youtu.be/JReQXSC3Jlo
07 Glissando example https://youtu.be/eOAL9rIsJSM
08 Slap technique https://youtu.be/b_rU0ghehtE
09 Short heavy bow to imitate slapping https://youtu.be/TBb52gcvUnQ
10 Pizzicato to imitate slapping https://youtu.be/3FGVaSWyvrE
11 Col legno to imitate slapping https://youtu.be/Qf4kNjPJ9Ek
12 Recording 02 https://youtu.be/9djWbiHbk3M
13 Final research recording https://cutt.ly/btZuYF4

Appendix 2: Critical media review

- Apocalyptica (2005). Apocalyptica. (CD). Finland: Universal Music Germany/Vertigo.

  This CD is the fifth album of Apocalyptica, released in 2005. Apocalyptica is a Finnish metal band created in 1993 and formed in its origin only for four cellos. Nowadays the band also has a drummer and a vocalist. The CD is relevant for my research due to the performers play rock/metal music with the cello in it and that is my research idea. Listening to it I can get ideas about how to play this kind of music and compare with other groups. Also, the piece that I have chosen for my reference recording is *Quutamo*, the second song of this album. So this is another reason to take this CD as an important source for my research.

- 2cellos (2013). Live at Arena Zagreb. (DVD) . Zagreb: Sony Masterworks.

  This source is a DVD from the Croatian and Slovenian cello duo. It is the first live album of the group and it was filmed during the tour of his CD *In2ition*. It was recorded in the sports hall from Zagreb.This duo has a completely different style from the last band, Apocalyptica. Unlike them, 2cellos play more styles of music, from classical to rock, going through pop music. Because of that, this group is also relevant for me due to the variety of music that they can perform during a concert. Being a DVD I can observe more clearly how they play the pieces of it and the techniques they use during each one, being this way easier to acquire the knowledge necessary for my performance and to compare with other musicians or groups.

- Arango Mantilla, Ana María. "Propuesta metodológica para la inclusión del rock en la enseñanza del violonchelo." Bachelor's thesis, Universidad Nacional de Bogotá, 2018.

  This research was written in 2018 by Ana María Arango Mantilla in Bogotá (Colombia). It was done as research to obtain a music bachelor degree. Throughout it, Arango Mantilla proposes to include rock music in the teaching of the cello. For it, she developed a few technical exercises (rhythm, bowings, articulation, improvisation, etc) in order to apply them to Rock music. Also, she made three transcriptions of different songs and her own composition to show the knowledge acquired.
  I coinsider this research useful for my own research because we have the same purpose, to include rock music in cello performance and she proposed really good ideas for adapting different techniques.

- Lasala Barcelona, Néstor. "The language of the electric guitar interpreted on a violin." Master's research, Fontys School of the Arts of Tilburg, 2019.

  The research from Néstor Lasala Barcelona "The language of the electric guitar interpreted on a violin" was written in 2019 in Tilburg. In this research we can learn how to achieve a guitar sound (in this case Paul Gilbert's sound) on a violin trying to keep the style and the spirit.
  In his research, Lasala Barcelona made an arrangement from *Fuzz Universe* by Paul Gilbert. This song is a piece for solo guitar with drums and bass doing the accompaniment. Throughout the

research, Néstor shows us how to get a similar result from the perspective of a classical musician.

Also, he writes about adapting the arrangement to the technique of the violin. That means to check how the violin can get some guitar sounds, for example we can achieve a wider vibrato from the guitar doing an up and down glissando several times. Taking his research as a base, I could get some ideas about adapting different guitar sounds or techniques on the cello.

Appendix 3: Full feedback on reference recordings

Reference recording 01

- Laura Gónzalez
  - Cello 1: more intensive and bigger vibrato, bar 3 to 10 less present and more legato in the melody.
  - Cello 2: the motif of bar 1 and 2 is not regular and play it in a slur bar per bar, tune bar 21 with cello 1.
  - Cello 3: the articulation is generally soft. Think the movement from the complete right arm not from the wrist.

- Silvia Gallego
  - Cello 1: more vibrato and play the tune in the 2nd string to get this new color.
  - Cello 3: stand out harmonic changes.
  - Get a compact sound.
  - Suggestion to add percussion.

- Myself
  - Cello 1: close every phrase and play the lines less fragmented, fix tune problems in some points (bar 10, 16, 17, 27 and 31) and make a long phrase (bar 3 to 10).
  - Cello 2: stronger articulation in left hand in motif of bar 1 and 2.
  - Cello 3: soft articulation, mostly fifths are out of tune and the accompaniment is out of style.

Recording 01

- Silvia Gallego
  - Cello 1: Rhythm is not clear in the beginning, from bar 47 more sound.
  - Good balance.
  - Direction and more activity.
  - Intense moments, more vibrato and bow to the bridge.

- Laura González
  - Tuning problems.
  - Bar 14 and 15, first and second cello are not together.
  - Cello 1: more soloist, intense vibrato and more legato.
  - Cello 2: from 47 to 53 tuning problems. Motif bar 1-2 more bow and faster bow speed.
  - Cello 3: more power. Rhythm part direct attack and more clear. When it plays long notes, play supporting first cello.
  - Cello 1 and 2: motif bar 12-13 more articulate and interrupt the melody.

- Myself
  - More distortion sound in cello 2.
  - Bar 14 cello 1 and 2 are not together.
  - Rhythm is not stable.
  - Accompaniment more staccato.

- ○ Cello 1 more vibrato.
- ○ Tuning cello 2 from bar 47 to 53.

- ● Ana María Arango
  - ○ In this song we can show the versatility of the cello in all the registers.
  - ○ Despite the percussion give a big power to any Rock piece, only with this ensemble we can get similar results thanks to the rhythm (cello 3).
  - ○ Good ensemble and arrangement.

Reference recording 02

- ● Ana María Arango
  - ○ Preference of my version over the original due to the original sounds overload and noisy.
  - ○ Good balance and use of the different registers (low, medium and high) making the song sound complete.
  - ○ More cello 2 in the second voice from bar 40 to 56. Better balance to hear the harmony.

- ● Néstor Lasala Barcelona
  - ○ Cello 3: third bar G instead of D. Gives more power and completes the harmony.
  - ○ Cello 1: make glissandi in motif from bar 9 instead on making the jump trying to imitate the electric guitar technique (Slide technique) and more heavy sound from bar 19
  - ○ Cello 3: sometimes take the role of the drum (as in bar 28) instead of focusing only on the harmonic base.
  - ○ Cello 3: bar 18 try to play notes not only hits. Take care of the final sound.
  - ○ Cello 3: good energy!

- ● Myself
  - ○ First cello intention. Be more in Heavy metal style.
  - ○ Bite more the beginning of the notes.
  - ○ Cello 3 to heavy in some moments.
  - ○ Change bar 18 cello 3 (experiment).
  - ○ Cello 1 less spiccato from bar 19.
  - ○ Bar 40 cello 3: change the long notes for drums rhythm.
  - ○ Cello 2: good the glissando from bar 57.
  - ○ Cello 2: more ff melody from bar 73.

- ● Job ter Haar

  I think this is a good improvement from the previous video I saw (I think it was in May)! The arrangement is more interesting and your playing is stronger and has more drive.

  - ○ Arrangement: Good in general, but I feel that it should be possible to have more rhythmic elements. At times when this is happening, the arrangement works better. It can be challenging to do this with three cellos, because often you will be the only cello doing the bass and the rhythm. What I miss is both the relentlessness of the drum kit, especially the syncopation; but also the variation, which the original has a lot. There are ways to do this on a cello, you are already using some of these possibilities, but you could go further in this. Did you contact Rushad already? I find the Apocalyptica solution, simply add a drum kit, a bit too easy, as it creates a sense of duality, it actually makes the cellos sound

more classical... I think it is better the way you do it, all within the 'cello universe'. As a listener, I accept that more easily. You could also consider adding one more cello... anyway, there are moments in this arrangement that one cello is not playing, I think you could use this cello then for rhythmical variety.

○ Playing: as I said, your playing is now strong and you provide a good 'drive'. This makes it very clear when you are slightly off, as happens from 0'58. It's only a bit, but there you take too much time retaking the bow sometimes, is my impression. In general, I feel that you are still a bit 'heavy' in the rhythm, it could be just a little bit more 'forward'. You are using a good variety of attacks, it is still a bit on the clean side so you could use the 'dirty' sounds even more (as long as it doesn't make you lose tonal strength). Try also using the movements of the wrist to hit the string, this is a technique that classical players nowadays don't use so much but in Tango it is very normal (as it is in 19th century style string playing). You play mostly from the arm, which gives a strong sound but is less versatile in rhythm and attack. I believe a combination is very well possible, also in modern cello playing.

○ Ensemble playing: generally quite good, but sometimes the sense of rhythm and tempo is not the same in the three players. You are nice and stable but a little bit heavy in general, Ale is sometimes behind, and Jorge plays with a lot of forward drive which I think is great. It takes time to develop this together.

○ Did you think about learning scratching techniques? That would help in many aspects. It would add more rhythmical layers to the arrangement, it would make the sound a bit more dirty, and it would definitely improve your wrist technique.

Recording 02

● Néstor Lasala Barcelona
  ○ Good improvement of the rhythmic parts, better adapted.
  ○ Make difference between introduction/verses and chorus. Introduction/verses more aggressive, close to the bridge, even dragging. Chorus more melodic and singed.
  ○ Good distribution of the voices in the chorus part.
  ○ As they are classical instruments, we have to exaggerate everything: articulation, vibrato (cried sometimes)...
  ○ Cello 1: need more glissando/slides in chorus also. Change the articulation in some moments.

● Job ter Haar
  ○ Again, better than the previous one.
  ○ Rhythm in the ensemble is much better.
  ○ Cello 3: still loses the drive from bar 40.
  ○ The sound is more rough, which he likes.
  ○ Idea: try the beginning (or other material) without vibrato. The continuous vibrato makes it a bit "civilized"

● Ana María Arango
  ○ Better result.

- Good balance and it sounds more active.
- Good articulation and clear phrases.
- Arrangement is complete and good harmonized.
- It has attitude, strength, power…

- Myself
    - Don't rush bar 7 and 8.
    - From bar 4 same articulation en cello 1 and 2.
    - Cello 1: from bar 19 more heavy and rough, sometimes it sounds "too happy".
    - From bar 73 to 82, be more torn.
    - Cello 2: perfect melody bar 57.
    - Cadenza bar 90 more drive, go forward.

- Mr. Marcaille
    - Nice arrangement and performance.

Final recording

- Pablo Sánchez
    - The changing of the voices works great. Good idea.
    - In this style is very important a continuous rhythm and it is quite good in the recording. Besides recording problems.
    - Keep the sound until the end of the notes, especially in the main melody / theme.
    - More character and articulation in medium range. It sounds a bit weak sometimes.
    - Even in a singed line, keep the idea of the articulation.
    - The original song has a lot of power, try to get it.
    - When there is a "question - answer" between voices, play a clear beginning in those lines.

- Job ter Haar
    - Good format for this kind of arrangement.
    - Good combination of voices.
    - Four cellos is a big improvement over three. The piece never sounds empty or meager.
    - Good use of the texture change, having solos and using special effects.
        - You can explore further in the future, so that the arrangement becomes even more colorful.
    - Perhaps some more diversity in the rhythmical accompaniment could also make it more varied, especially if you want to build up a repertoire from arrangements like this you will want to have a lot of variety.
    - Playing: is not easy at all to make multitrack recordings. Intonation and rhythmical alignment are challenging. So it can be improved.
    - Even Though, the performance is convincing to me because the rhythmical drive is in general good and the sound is roughness and presence on your playing which works very well.
    - Determination and presence in your playing which is working really well.
    - Things to explore further:

- ■ More and more effective use of extended techniques: scratching and electronics. If you perform this in live, probably it should be amplified and once you start doing that, you may as well start manipulating the sound.
- ■ Maybe experiment also with a loop station, so you can have even more layer with four cellists.

- ● Ana María Arango
  - ○ I love the arrangement. Well done!
  - ○ You achieved all the effects typical from electronic instruments with the cello.
  - ○ Sometimes it doesn't sound like cellos, it sounds like a complete band but with the advantages of the cello sound. It gives power.
  - ○ Harmonically well elaborated.
  - ○ It sounds full at every moment.
  - ○ Really interesting the interaction between the different voices.
  - ○ Good use of different ranges of the cello.

- ● Myself
  - ○ Problems with the video. The alignment of the rhythm is not always good.
  - ○ The movement between the different voices works good.
  - ○ Death growls sound can be more broken.
  - ○ Bar 24 and 74 cello 3, more presence.
  - ○ Good character.
  - ○ Cello 2, tuning in main theme (bar 33).
  - ○ Rhythm cello 3 and 4 from bar 41, really good character.
  - ○ Textures/new sounds cello 1 and 2 from bar 41 to 47, work really good.
  - ○ Guitar solo sounds full together with the accompaniment.
  - ○ In general ilt sounds full at every moment. The rhythm has character and it is stable, going always forward.

- ● Mr. Marcaille
  - ○ Nice stuff!
  - ○ Sometimes it is not sounding together but no worries.
  - ○ To fix a bit you can increase the volume of some rhythmic parts. One rhythmic part louder than another. It will give some depth and relief. Also, it hides what you feel to be.

Appendix 4: Transcription of interviews

1. What kind of music are you used to working with in the studio?
   In Estudio Uno we work with almost all the styles of music and almost all the productions, from jazz trio and soundtracks with string orchestras with 40 musicians to rock bands playing live, folk singer-songwriters, indie… everything.

2. Have you ever worked with string instruments?
   Of course, as I said, we record a lot of orchestras for soundtracks of films, series, documentaries. Also, many classic artists come here to record their personal projects.

3. If yes, what kind of music (classic, pop, rock…)?
   The most common are string orchestras who come here to record discs for pop, indie, rock artists… Also we record a lot of classic music but they are much smaller ensembles, three or four people normally and not always with string instruments.

4. In reference to question two, have they ever used electronic devices, besides microphones?
   Of course, any instrument can be placed with a contact pad, a small microphone that converts the vibration of the instrument into high impedance electrical signal, which allows us to pass the clean signal of the instrument, in this case the cello, by any amplifier guitar and effects pedal, and record it.

5. What type is the most recurrent?
   They tend to be for pop productions or for movies.

6. Finally, what do you think a classical musician should take into account when he/she plays rock of another kind of music out of classical music?
   Mostly, to understand that it is another music style and the role into the song can be different. The best thing is that this can open the door to creativity, whether musical or sound. You can create textures with different arrangements, with noises, with effects; any sound the instrument can make, can be modified with analog or digital signal processors.

1. How do you track the distortion?
   The tracking of digital distortions is in general better than analogue ones. It means that the lower strings will be better and faster distorted. However analogue ones sound a bit warmer and more organic.
   I used to use a Fulltone OCD analogue distortion and that sounds wonderfully open and glassy on the higher strings of the cello. But went on to use a Sourceaudio digital pedal because of the tracking issues.

2. With digital distortion, you mean that the sound is processed by the computer and not by the pedals/amplifier?

Digital distortion means that the signal is turned to digital code before processing and after that it is converted back to analogue. So yes a computer program works exactly that way. But you also have guitar pedals that are digital.

With analogue signal paths there is no conversion so it sounds more natural. But as I already wrote the difference in sound is not that big and digital pedals track way better. But because of this they may have a lack of "character".

That being said the analogue Fulltone OCD sounds beautiful on the upper strings. The lower strings are not that responsive.

So depends a bit on what you want.

3. When you use a contact microphone, where do you think it is the best place to put it? I used to do it on the bridge, but some people proposed to me to try it in the pegs or endpin, what do you think?

I use The Realist pick up. This is placed between the bridge and the top of the cello. It's not something I take off very often so it is basically all the time there. Sound is very powerful and bassy. Great for playing bass and plucking. For bowing it is good but sounds still very much like a pick up. Too close, direct, dry and nasal.

I usually combine The Realist with an AKG C144 (I don't remember exactly the number. Can be different. Need to check).

This is also a pick up but more like a condenser microphone. It has less body but sounds much more like a cello. It needs phantom power though. I put this with a putty in the middle of the cello between the bridge and stringholder.

I use a headway double preamp to combine the two signals. Both pickups need heavy EQ-ing! It is as close as you can get in preserving the natural cello sound and having great volume and feedback resistance at the same time. It took me more than 15 years of experimenting to reach this point...

4. What computer program do you use to add electronic effects?

I use logic pro to create music and mix. It also has a ton of good quality effects but so far I used mainly guitar effect pedals on my cello. But I can recommend logic pro for you if you haven't used it yet. A great all round program.

Interview Néstor Lasala Barcelona 16/10/2019

1. Do you know more people who do something similar?

I have a cellist contact who plays really good and also plays modern music. He records songs by Slipknot or Marylin Manson. Maybe he can say something to you about pedals or effects.

2. Did you play with electronic devices?

No, I didn't try any effects and I don't have any. What I can tell you is to make an historical approach as I did.

In my case, Paul used Fuzz and another pedal designed by him, apart from Wa, Overdrive… the typical ones.

3. What do you recommend to me in order to get a similar sound?

You can look for videos or maybe you have more details on interviews, especially about music brands.

There are interviews with some guitarists, as Ibanez or Gibson, and they told the equipment that they use. Some of them change a lot from one Cd to the next one but it is not common. Steve Vai, for example, is another world but they don't use to change that much.

So you can look for videos or interviews from someone and just copy the set. It doesn't have to be exactly the same but see how aggressive the Overdrive is, if it is clean, weird effects… Trying to do something similar.

And if at the end you don't want to use electronics (or it is too expensive), be imaginative and use resources: play close to the bridge, different bow strokes… you already know about that.

Interview Mr. Marcaille 28/10/2019

1. Did you start playing Rock/Heavy cello or classical? (If you started as a classical musician: how did you decide to move into it?

   I start learning cello when I was a kid, same time I discovered the records from AC/DC, Sex Pistols, Judas Priest and live guitar fuzzy sound.

   I was mixed up from the beginning, later I started bass guitar to play with my mates in a band, drums as well. More like 20 years ago I decided to break the cello learning, time to un-learn and then start again with some improvisations, free stuff, and push it into the electric world.

2. What are your influences playing?

   My influences are wide, just practical. I started to learn bass guitar playing on Motorhead and The Cure records, because I liked Motorhead of course, and both bands brought some good bass lines. Then most was by practicing with bands from different instruments, but always growing up even though they are not the same bands.

3. Which difficulties did you find playing this music with a classical instrument?

   Cello was made for Rock'n'Roll , and other stuff. It's a powerful instrument, nice range and tuning, from good singing to rhythms, like supposed to be power chords.

   As well I decided to push it into Rock'n'Roll because at one point that's my most familiar instrument.

   The most difficult thing to play something else than classical , not only rock, but also improvisation, contemporary music is to un-learn from the classical learning (as you're always keeping some technical stuff) , free the brains!

4. Which sound do you want to achieve? How do you do it (techniques, electronics...)

   I like the overdrive, fuzz sound, and it's a perfect matching with the cello. As any string instrument you can always get some "distorted sounds" by playing two strings at the same time.. some nice tuning frictions as well.

   I make it simple, cello out from a pickup to Jack, then feel free to match it with guitar and bass amplifiers, and few effects.

5. How do you see both classic and Rock scenes nowadays?

   Classic is probably getting a bit more open minded. I met some nice cellists who are working on opening minds to their students, like Giovanni Sollima and Enrico Melozzi (100 Cellos).

   Séverine Ballon is a very nice cellist in contemporary music and improvisation as well and of course some more I don't know or think about actually.

   Rock, popular music scene is kinda always between underground and industry, it goes from time to time with nice explosions of sound and originality, sometimes a lot of followers.

Obviously the underground part is the most effective in bringing some original stuff, experiments and friendship.

It's like life, can't speak for everyone

6. Do you know more people who do something similar?
   There are some people who are doing nice stuff with hurdy gurdy, harp, or self built instruments.
   like for example
   France https://france-trio.bandcamp.com/
   Ozma https://youtu.be/hZSvW4vt1KA
   Guili Guili Goulag https://www.youtube.com/watch?v=g04O4sLDK7k

Appendix 5: Transcriptions/annotated scores/analyses

Quutamo transcription excerpt.

Quutamo

Eicca Topponen

Quutamo acoustic transcription excerpt.

Quutamo acoustic

4

How far transcription excerpt.

How far

Eicca Toppinen
Arr. Belén Ruiz

My life is a
cir - cle no be - gi-ning and no end.

can't_____ be e - rased like a file. I've got all I

wan - ted but still I'm not sa - tis -

Quutamo by Apocalyptica. Belén Ruiz complete version.

Quutamo

Afterlife by Avenged Sevenfold. Belén Ruiz complete arrangement.

Afterlife

Arr. Belén Ruiz

Avenged Sevenfold

War eternal by Arch Enemy. Belén Ruiz complete arrangement.