INVISIBLE SOUNDS FOR CALVINO'S INVISIBLE CITIES

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Abstract

Inspired by Italo Calvino's novel *Le città invisibili* (1972), which presents Marco Polo's description of several invisible and fictional cities, the authors embarked on an imaginary journey to create invisible sounds with the subtlety of the fortepiano. In a process akin to Calvino's novel, the article presents the exchange of ideas between the composer and the performer, physically separated, in Brazil and Portugal, communicating through video conferences and e-mails. As the process evolved, technical aspects of the fortepiano and its peculiar sounds were intertwined with adjustments to the composer's creative writing. The combinatorial structure of Calvino's artwork anchored the exchange of musical materials between the work's movements. This artistic-research project began in April 2014, and led to the recording of *Sons Invisíveis* (*Invisible Sounds*), included in the CD *New Music for Old Instruments II* in 2016. In order to describe this process, this article addresses procedures of composition for historical instruments, particularly the fortepiano, the combinatorial nature of Calvino's writing and its corresponding structure in the work, and its final organization, expressing the ineffable character of Calvino's masterpiece through invisible sounds.

Keywords: Artistic Research; Composition; Fortepiano; Invisible Cities.

Resumo

Inspirados no romance *Le città invisibili* (1972), de Italo Calvino, que apresenta a descrição de Marco Polo de várias cidades invisíveis e fictícias, os autores embarcaram numa viagem imaginária para criar sons invisíveis com a sutileza do pianoforte. Num processo semelhante ao romance de Calvino, o artigo apresenta a troca de ideias entre o compositor e a intérprete, separados fisicamente, no Brasil e em Portugal, comunicando-se através de videoconferências e e-mails. À medida que o processo evoluiu, aspectos técnicos do pianoforte e seus sons peculiares foram entrelaçados com os ajustes na escrita criativa do compositor. A estrutura combinatória da obra de Calvino ancorou a troca de materiais musicais entre os quatro movimentos da obra. Este projeto de pesquisa artística teve início em abril de 2014 e culminou na gravação de *Sons Invisíveis*, incluída no CD *Música Nova para Instrumentos Antigos II* em 2016. Para descrever esse processo, este artigo aborda procedimentos de composição para instrumentos históricos, particularmente o pianoforte, a natureza combinatória da escrita de Calvino e a sua estrutura correspondente na obra musical final, expressando o caráter inefável da obra-prima de Calvino por meio de sons invisíveis.

Palavras-chave: Pesquisa Artística; Composição; Pianoforte; Cidades invisíveis.

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1. INTRODUCTION

The performance of historical keyboard instruments such as the harpsichord and the fortepiano are often solely associated with period repertoire, i.e. repertoire created during these instruments' era, stylistically connected with specific instrumental types and models. The gradual substitution of the harpsichord by the fortepiano, at the end of the 18th century, led to its disappearance from the stages and the subsequent lack of new repertoire. In the case of the fortepiano, since the creation of new works always accompanied the swift organological changes that the instrument underwent during the 18th and 19th centuries, the historical and repertoire gap that pointedly affected the harpsichord did not interfere significantly with the fortepiano repertoire, since its association with the instrument was not questioned and it were adopted as idiomatic, notwithstanding the marked differences between piano models. Thus, works composed for the (forte)piano since the mid-18th century remain part of its staple repertoire.

The creation of recent repertoire is connected to the revival of these two instruments during the 20th century, but the most prominent corpus, namely considering its size and variety, was dedicated to the harpsichord, following the creation of "modern" harpsichord models. These designs, namely those developed by the French firms Pleyel and Érard that were presented at the Paris Exposition of 1889 (PALMER, 2019), may have been aimed, initially, at the performance of historical repertoire, but the availability of the instruments, albeit limited, eventually led to the creation of new works. In this context, the contribution of three women performers towards the dissemination of this new repertoire should be highlighted, through their commissions and contacts with composers: Wanda Landowska (1879–1959), Sylvia Marlowe (1908–1981), and Antoinette Vischer (1909–1973). As these early 20th-century revival harpsichords were gradually superseded after the 1960s by copies of historical instruments (LO, 2004; ZUELICKE, 2017), the performance of the extant 20th-century repertoires was transferred to these models, and newly-composed works were adapted to the sonic characteristics of the harpsichord copies.

In the case of the fortepiano, this transitional phase did not occur, nor was there a need for the creation of modern alternatives, as mentioned above. The fortepiano has experienced a more recent revival and copies are not as widely available as harpsichord copies, thus its recent repertoire has not yet matched the wealth and variety of the 20th- and 21st-century corpus of harpsichord works. Moreover, composers are seldom familiar with the technical characteristics and the sonic affordances of the fortepiano, and the fact that the access to extant historical instruments is generally restricted and fortepianos copies are often privately owned, has compromised a wider dissemination of its recent repertoire. Thus, composing and performing new works for the fortepiano presents various challenges, since an adequate understanding of the instrument's timbre and technical specificities is required (MARINHO; BRANCO, 2019; MARINHO; CARVALHO, 2012). Furthermore, the contact and collaboration with a performer is often essential, as the available models display diverse features and technical / performative options.

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This article describes and discusses a project that combined several artistic-research perspectives, leading to the creation of a new work for fortepiano, *Sons Invisíveis* (*Invisible Sounds*), inspired by *Le città invisibili* (1972) of Italian author Italo Calvino (1923-85). In this fictional work, the narrator, 14th-century Venetian explorer Marco Polo, describes to the ruler Kublai Khan 55 cities that he had visited. Each description is a separate, short chapter, resorting to a style that mixes prose and poetry. We realized that Calvino's imaginary city descriptions and reports could be a fertile ground to build relationships with specific sounds of an historical instrument, the fortepiano. The fortepiano work *Invisible Sounds* presents four movements: "Memória de Zora" ("Memory of Zora"), "Olhos de Valdrada" ("Eyes of Valdrada"), "Trocas de Eutrópia" ("Trades of Eutropia"), and "Fios de Octávia" ("Threads of Octavia"), inspired by four of the cities described by Calvino in his book. The project began in April 2014, and concluded in 2016, when the four-movement work was recorded as part of the CD *Música Nova para Instrumentos Antigos II* (*New Music for Old Instruments II*) (MARINHO; CARRILHO; AGUIRRE, 2016). The project aimed at mapping and discussing issues such as: 1) addressing collaborative procedures and historical instruments, 2) the interrelation and shared influences between literature and music in the context of composition and performance, and 3) the compositional and performative issues involved in the process of creating new repertoire for an historical instrument. This article addresses these two last topics.

First, the article maps the methods applied for adapting historically informed techniques to a contemporary creative context, discussing topics associated with composing for, and performing historical instruments, particularly the fortepiano, focusing on issues of timbre and the specificities of performance techniques. Then we proceed to discuss associations between music and literature (SCHER, 1982; ALLIS, 2017), and how the combinatorial nature of Calvino's writing (CANNON, 1979; MORENO-VIQUEIRA, 2012) paralleled the compositional strategies applied in *Invisible Sounds*. We also describe how the subtle sonorities of the fortepiano were addressed in order to express the ineffable character of Calvino's masterpiece. Our case study highlights how the process was developed and how we collaborated by means of e-mails and discussion mediated with video meetings, since Jônatas lives in Brazil and Helena in Portugal.

2. REFERENCES & CONTEXTS

In order to contextualize the project, this section addresses two issues that ground the creative processes: the characterization of the fortepiano, in order to highlight its organological and historical specificities that underlie its sonic affordances and the interrelation between music and literature in the construction and performance of musical works.

2.1 The fortepiano

The fortepiano is sometimes described as an underdeveloped forerunner of the modern piano, a viewpoint that does not acknowledge the fact that its organological

characteristics, throughout its history, were always connected to the performing contexts. Pianos manufactured until the end of the 19th century were adapted to the repertoires, timbre ideals, type and size of venues, and to the accompanying (or accompanied) instruments of their time. Invented around 1700 by Girolamo Cristofori, the fortepiano was initially designed to perform dynamic nuances, an affordance that the harpsichord could not address. Thus, early 18th-century pianos emulated the harpsichord's sound, whereas later models followed other aesthetical paths. In general, late 18th-century Viennese models, with their short-lived resonance and marked timbre differentiation between registers, were adapted to the keyboard repertoire of the Classical era and its emphasis on phrasing and articulation. On the other hand, British models, during the transition to the 19th century, were more resonant and produced more sound volume, as they were adapted to the growing venues and orchestras, and to the sweeping lines and phrasing of the romantic style (COLE, 1998). What we call nowadays the "modern" piano is a design that closely resembles late 19th-century pianos, since recent technical alterations have predominantly focused on the optimization of manufacturing processes and materials, rather than on significant structural and sonic alterations.

The fortepiano used in this project is a copy made in 2002 by the American builder Paul McNulty, based on an 1805 Viennese model by Anton Walter, with five and a half octaves, and two knee-levers under the keyboard (Figure 1)[2].

Figure 1. The fortepiano used in this project, built in 2002 by Paul McNulty.

The right-knee lever has the same function as the modern piano's sustaining pedal, and the left-knee lever is a moderator, which interposes, when engaged, a fabric strip

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3   Description of the instrument in Paul McNulty's site: https://www.fortepiano.eu/walter-sohn-ca-1805/.

made of felt between the hammers and the strings. This latter pedal reduces the sound volume, but also creates a distinct timbre, which displays characteristics different from the standard *una corda* pedal of modern pianos. 18th- and early 19th-century pianos, in fact, often included several knee-lever stops for sound effects, interposing materials such as felt or parchment for varied timbres, or including mechanisms that produced percussive effects. The effect of the moderator is quite striking, especially when combined with the sustaining pedal. The following audio example of a fortepiano work by the Portuguese composer Domingos Bomtempo demonstrates the use of the McNulty fortepiano in the performance of historical repertoire. The moderator is used several times for timbre contrast in this excerpt, which includes the introduction and the theme of *An Introduction, Five Variations and Fantasie upon Paisiello's favorite air, Op. 6*, published in London by Clementi, Banger, Hyde, Collard & Davis, probably composed in the 1810s, when Bomtempo lived in London (Example 1).

Example 1. Domingos Bomtempo. Audio excerpt of An Introduction, Five Variations and Fantasie upon Paisiello's favorite air, Op. 6. Played by Helena Marinho (fortepiano), score at. [editor aqui vai o audio mp3 supplementary file] https://drive.google.com/file/d/1JzFwy0dlZvnrJYeQ4SvNZjOB6FjdQbHT/view?usp=sharing

1.1 Literature and Composition Strategies

At a basic level, the interaction between composition and literature may address musical repertoire that is anchored in a text, like vocal works. Literature, nevertheless, can also act as a source of inspiration for the composition of instrumental music, and this influence is evidenced by programmatic titles or supporting texts created by the composers, as well as through specific procedures of integrating extra-musical references through compositional strategies and techniques. The range of analytical approaches is manifold, and the extant research, in the field of Western-art music, has addressed perspectives such as comparative topics – like the concept of melopoetics (SCHER, 2004) –, and issues of signification (KRAMER, 1995) or gender (KRAMER, 1997). We can also consider the different levels of intertextual connections (GENETTE 1997) that language and writings can establish with musical works, which further increases this wide range of research interfaces.

Scher (1982) discussed three categories addressing the dialogue between music and literature: 1) literary imitation of the acoustic properties of music; 2) adaptations of musical structures and patterns; and 3) application of musical techniques and devices in text structuring and arrangement, or the literary presentation of existing or fictitious musical compositions. These perspectives function mostly (and were proposed as such) as analytical methods, but they can frame prospective creative projects. Likewise, Allis (2017) has discussed reading music through literature as a possibility for interdisciplinary studies, particularly in cases when the nature of the literary text suggests a different analytical or interpretive methodology. Allis addresses several reading possibilities, namely programmatic music in which the composer develops the musical structure taking into

account the implications of poetic models. This perspective is significant for the analysis of the work undertaken in this project, taking into account some specificities of Calvino's writing techniques.

Calvino's writing approach is defined as combinatorial literature (CANNON, 1979), involving a search for alternative disciplines outside the traditional canons of literary writing, such as mathematics, science or other humanities, in order to structure the narrative of a work. In an analogous study, Malufe and Ferraz (2015), while describing Luciano Berio's compositional approach to Samuel Beckett's texts, pointed out the construction of chains of meaning through a free recombination of words (p. 151):

> What Berio sees in Beckett is precisely the free recombination of words in their completeness, so that they always evoke meanings, but these meanings, recombined with words, constantly provide spaces for the birth of new chains of meaning, and the text gives birth to new texts. (MALUFE & FERRAZ, 2015, p. 151)

Likewise, the structure of *Le città invisibili* could be seen as a type of code (HARRIS, 1990) that can be represented by a matrix of eleven theme columns; each column presents five entries and only one row, so there is a total of 55 cities (i.e., 55 sub-chapters). Moreno-Viqueira (2013) describes the "invisible mathematics" in Italo Calvino's novel as follows:

> In the scheme indicated by Calvino, each of the nine sections is subdivided in parts according to a combinatorial system. The rules of the narrative game are the basis of the numbers assigned to each city or group of cities associated by the combinatorial arrangements. Each theme appears five times, with five different cities, ordered as expected by the pattern (MORENO-VIQUEIRA, 2013, p. 29)

Thus, Calvino's versatility is anchored in subtle ways of using mathematics, so they may not be noticeable at first. The aim of Moreno-Viqueira's study (2013) was to unveil the hidden mathematics as an intrinsic tool to the writing process of *Le città invisibili*. He commented also that the mathematical concepts and images used in Calvino's work aim at a "latent yet invisible possibility, that searches for new forms (like the cities)":

> the enchantment of *Città Invisibili* consists in granting the reader the chance to become accomplice of this creative process, giving him the freedom to visualize the invisible. Departing from brief descriptions, and their commentaries, the reader feels free not just to travel through the book, but also to visually design or redesign each story, to inhabit each one entirely in his imagination. Analogously, at the opening of the third chapter, before the dialogue resumes, the Great Khan infers that, going from city to city, involved, not travelling, but a change of elements. (Moreno-Viqueira, 2013, p. 38)

In our artistic research project with *Invisible Sounds*, the compositional approach was guided by two types of interaction between text and music. Firstly, it aimed at a parallel approach between the combinatorial nature of Calvino's text and the organization of the piece into four movements. Secondly, it searched in the delicate and subtle sonority of the fortepiano a way of expressing the ineffable nature of Calvino's mas-

terpiece. As explained below, the creative process approached acoustic and technical elements of the fortepiano to underpin its architectural pillars. Therefore, it engaged also with latent possibilities of building new sounds using the fortepiano, resembling invisible sounds.

3. IMAGINING *INVISIBLE SOUNDS*

This case study departed from a dialogue addressing the description and discussion of specific idiomatic and technical issues associated with the fortepiano: understanding pedalling, articulation and phrasing aspects connected to historical practices was the basis of this project that deconstructed and recreated historically informed techniques following a contemporary perspective.

The creative process began with frequent email exchanges and video meetings by Skype. In our first emails, we discussed our appreciation for Calvino's masterpiece, and we decided to expand our ideas based on that novel. The cities are imaginary (hence the title *Invisible Cities*) and, therefore, we agreed it would be possible to construct a musical imaginary for the piece using specific sounds and performance techniques of the fortepiano. Initially, we agreed on a list of five cities to be explored: Zora, Armilla, Valdrada, Eutropia, and Octavia. Armilla, however, was not represented in the final version.

During our discussions, two preliminary aspects were important for the compositional process: in an initial mail, Helena pointed out that "the technique employed is very much based on finger technique [...] and subtle articulation choices", and that "there is quite a lot of difference in timbre between the low, medium and high registers; it is quite typical of the instruments from this time". This initial descriptive mail summed up some of the aspects that Helena regarded as most important to convey, based on a previous collaborative experience involving the fortepiano with the Portuguese composer Sara Carvalho (MARINHO; CARVALHO, 2012). Thus, we decided that timbre would be the main aspect for developing a composition, which would focus on the interaction between articulation and particular sounds of the fortepiano, aiming to connect contemporary styles and the fortepiano's sonic singularities.

In the next email, Helena sent some comments about the translation differences in her edition of Calvino's book: "I noticed the translator of my [edition] chose 'subtle cities' instead of 'thin cities'; [...] I will see if I can find the original Italian version in order to understand the actual meaning; 'thin' and 'subtle' seem very different." Jônatas's response was: "I believe subtle sounds works perfectly [to describe] the piano-forte; [...] because I am relating 'sounds' to 'cities' like in Marco Polo's travels; […] that is, the performer will be like him, visiting cities through travels."

Finally, we discussed Calvino's thematic organization, as mentioned above. In the book, the cities are organised into a series of 11 categories. Thus, Zora was related to the topic "cities and memory"; Valdrada to "cities and eyes"; Eutropia to "cities and exchanges"; Armilla and Octavia to "subtle cities". Since our aim was to highlight these relationships, the whole work was entitled *Invisible Sounds*, with four sections, each focusing on a single city and on one of its defining characteristics.

Another topic discussed through mail exchanges dealt with the use of tonal references and their interaction with tuning and temperament. The fortepiano used in this project is usually tuned at 430 Hz and Helena chooses historical temperaments adapted to the repertoire or to the characteristics of the accompanying instruments (in the context of chamber music). For solo music, Helena usually used Neidhardt's 1724 temperament. One of the consequences of using historical instruments is the implications that tuning entails for overall tonal colour and perception, and for the specific character or affect of a work (an aspect pointed out in period theoretical writings, which eludes our current perception of these issues). Thus, in a mail about the subject, Helena mentioned several keys and their association with paradigmatic period repertoire, as a source of information about the adequacy of particular tone colours and work character: C-sharp minor - Beethoven's Op. 27 no. 2; E major - Haydn's Piano Trio Hob.XV/28); E-flat major - Mozart's "Kegelstatt" Piano Trio, K498; or D major - Schubert's Violin Sonatina Op. 137, no. 1. As referred by Helena in the mail, "as one adds flats and sharps to the tonality, the 'stranger' it may sound, in case one chooses historical temperaments instead of equal temperament."

A final aspect of the search for the representation of subtlety, transparency, and invisibility through sonority was anchored on the peculiarities of the fortepiano, establishing a parallel with the subtleties in Calvino's novel. Therefore, the timbre and technical aspects were related to:

a) performing without pedal as an emulation of the harpsichord sound (the instrument at the origin of the fortepiano);

b) using the moderator as a source of a *dolce* sound;

c) using the pedal as a source of 'clean' resonance;

d) combining the pedal and the moderator as the source of a harp-like sound;

e) using the pedal *ad libitum* to produce a unique timbre, since it mixes the notes, but does not make them indistinct.

4. CREATING *INVISIBLE SOUNDS*

For an effective exchange of materials, it was necessary to transform, at each point of trade, the chosen music elements, and reassemble routes. There is not such a thing as an absolute subject because, in addition to the permutation of ideas, other mechanisms intervene and modify them. As in Polo's and Khan's dialogues, meaning emerges from the adaptations of form and content. A music organization is created from essential changes applied to the materials and the elements, which requires both agents to understand and cooperate with each other. It is discussed later in this section relating the concept of self-organization and composition (MANZOLLI, 1996).

Therefore, in the next sections, we address the outcomes of the creative process, and how the joint work between Jônatas and Helena converged in invisible sounds that describe Calvino's invisible cities. Performative issues are discussed firstly, followed by the resulting compositional organization and commentaries about the recording of *In-*

visible Sounds, which became a part of the CD *Música Nova para Instrumentos Antigos II* (*New Music for Old Instruments II*).

4.1 Performative Affordances

As an example of the work undertaken in this project, we highlight, in this section, some performance issues that were particularly pertinent for defining performance choices for the fourth piece of *Invisible Sounds*, "Fios de Octávia" ("Threads of Octavia")[3]. The initial score did not include pedalling or dynamic indications, and the register was not adequate for the fortepiano. We had to discuss transposition possibilities and whether the piece would require cuts, and those options led to considerable changes in the final version. Regarding dynamics and pedalling, Helena had to try different approaches, taking into account the register and the fortepiano's characteristics. Initially, Helena thought that playing at a faster pace would solve the problem of the fast decay in some high-register sections. However, after trying to play it faster, she realized that the solution was not to speed it up, but to play it even slower, resorting to a combined use of the moderator and sustaining knee-levers, and using both pedals for extended periods in order to create more natural resonances. The long and complex resonances had to be offset, not through frequent pedal changes (which would have led to a dry sound), but through articulation. Whereas the intended performative result partly depended on creating a *legato* character, in fact this was achieved through clear articulation and short-motive phrasing, with the pedalling technique creating the illusion of *legato*. Dynamics, in general, had to be adapted, as this movement consistently presents chordal textures in the left-hand part, which plays mostly in the mid-range of the fortepiano, precisely the most sonorous and full section of the instrument. In order to support an adequate focus on the melodic contents of the right-hand part, and creating the right balance with the more sonorous left-hand part, pedalling and dynamics had to be subordinated to the contents of the right-hand melody, an option that would be unusual or ineffective in the modern piano.

Two main performative issues arise in this procedure. Firstly, the use of a less known historical instrument can potentiate creative approaches, since the lack of references induce a freer, experimental approach. On the one hand, we have the historical differences involved in combining timbres, techniques and performance strategies with a contemporary style; on the other hand, the possibility of deconstructing and recreating historically-informed techniques. Several pedalling, articulation, and speed issues had to be adapted through performing techniques that are adapted to the organological characteristics of the instrument, even though they had to be applied to compositional contents that were quite diverse from the repertoire normally played on the instrument. Secondly, we can also highlight how our exchanges became the basis for choosing adequate tools and techniques in the learning and performing processes throughout the project.

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4   Recording at https://soundcloud.com/user-877190385/fios-de-octavia-threads-of.

4.2 Compositional Paths

As mentioned previously, in line with Calvino's vision of the Cities, which were designed with rigorous combinatorial art, as mentioned by Cannon (1979; MORE-NO-VIQUEIRA, 2013), the construction of the musical form of *Sons Invisíveis* (*Invisible Sounds*) was also based on a combinatorial process for exchanging musical material among the four movements, as shown in Figure 2:

a) the material from the right hand (R.H.) of I - "Memory of Zora" was exchanged with the left hand (L.H.) of II - "Eyes of Valdrada";

b) the material from the right hand of IV - "Threads of Octavia" was exchanged with the right hand of II - "Eyes of Valdrada", and with the right hand of III - "Trades of Eutropia".

c) the material from the left hand of IV - "Threads of Octavia" was exchanged with the right hand of III - "Trades of Eutropia".

Figure 2. Diagram of the compositional network created for *Invisible Cities.*

The network described in Figure 2 reflects the paths of imaginary trades and dialogues of the greatest traveller of all time. Movement IV exchanges material with movements II and III, showing how "Threads of Octavia" contains the main seed materials of the whole work, in this first section composed by Jônatas. Moreover, the figures below (Figures 3 to 5) also represent the trade and exchanges of music materials. The structural network in Figure 4 shows "Threads of Octavia", the first movement exchanged between Jônatas and Helena, as the source for musical trade, from which the materials for "Trades of Eutropia" and "Eyes of Valdrada" originated. Complementally, "Eyes of Valdrada" can be seen as a storage bridge and "Memory of Zora" as the start of the journey through the subtle sonorities of the fortepiano.
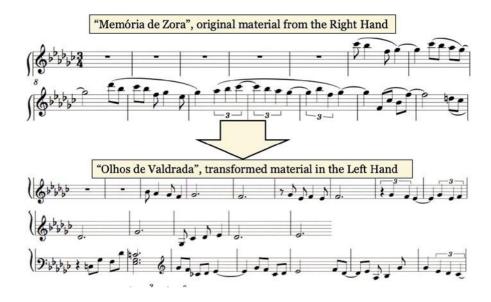
Figure 3. Content exchange between the right hand of "Memory of Zora" and the left hand of "Eyes of Valdrada."

Figure 4. Content exchange between the right hand of "Threads of Octavia" and the right hand of "Eyes of Valdrada."

Figure 5. Content exchange between the left hand of "Threads of Octavia" and the right hand of "Trades of Eutropia."

Thinking about the parallel between these compositional paths and the dialogue between Calvino's novel and Polo's trades with Kublai Khan, it is possible to envisage the compositional process as following the principles of a self-organized system (MANZOLLI, 1996). Debrun (1997) presented a relevant perspective on subject and self-organization:

> In the idea that a subject is the central figure - or whenever central – of self-organization, we notice there is a contradiction between the idea of subject raised to the paroxysm (if we mean an absolute or a transcendental subject) and the idea of self-organization. An absolute subject, or almost absolute, is incompatible with that. For if such a subject was possible, and if it wanted to, it would program or reprogram itself from the beginning to the end, in fact that operation would be an act of hetero-organization. (DEBRUN, 1997, p. 28)

When discussing the nature of the self-organization subject, Debrun pointed to the impossibility of an isolated and absolute subject. Likewise, our joint work could have led to another musical result, if the composer had sent a finished score, and the performer had suggested changes in the musical text due to the technical characteristics of the fortepiano. The relevant aspect of this creative dialogue lies in its synergetic nature and, by extension, the irreversibility of its time trajectory. These emerging properties are studied in recent literature highlighting group creative capacity. Sawyer (2017) discussed the notion of creativity in exchangeable environments and how the organizational dynamics leads to the convergence of a creative apparatus he called "Group Genius." Thus, it is not possible to redesign Jônatas and Helena's collaboration now. Rather, observe and learn from it, based on its global and holistic characteristics, since its outcomes are linked indissolubly to the creative actions.

4.3 Recording *Invisible Sounds*

The recording (MARINHO; CARRILHO; AGUIRRE, 2016) of *Invisible Sounds* presented several specific challenges as well. The CD included recent repertoire for recorder (played by António Carrilho) and fortepiano (by composer Daniel Schvetz), for solo recorder (composed by Rui Penha and Cândido Lima), for solo fortepiano (Jônatas's work, as well as a left-hand piece by Vasco Negreiros), and, interspersed and in dialogue with all these works, several movements of a J. C. F. Bach D-major Sonata (with Javier Aguirre playing the viola da gamba). Different tuning systems were adopted for the fortepiano parts, and equal temperament was used in the recent works, in order to ensure homogeneity between that repertoire, as well as a certain degree of contrast with the J. C. F. Bach Sonata. Recording period instruments requires specific decisions; mechanical noises, which would not be noticed in regular concert situations, can become an issue in a recording context. The recording of *Invisible Cities* coincided with days of remarkably high humidity, which could not be controlled at the studio where the sessions were held. This affected the knee-lever system, and even faint noises became quite noticeable. The software iZotope RX7 solved most of these issues, even though the result can be considered, to a certain extent, an intended but not actual representation of the aural image of an existent fortepiano. In this respect, the recording procedure itself led to the creation of implicit and hidden 'invisible' sounds. The final result is accessible through this link, which includes the recording of the four movements: https://soundcloud.com/user-877190385/sets/invisible-sounds-sons-invisiveis.

5. EPILOGUE

Inspired by Calvino's *Le città invisibili* (1972), the composition of this new work for fortepiano, *Invisible Sounds*, and its creative process was anchored into three aspects: a) the combinatorial nature of Calvino's literature; b) the use of the delicate and subtle sounds of the fortepiano to express Calvino's subtleness in the novel; c) the exploration of performative processes and strategies based on historical techniques, adapted in order to address the requirements of specific tonal and voice-distribution characteristics, leading the search for the thin and subtle worlds mentioned by Calvino.

Calvino's own writing expresses the exchange of musical contents in *Invisible Sounds*, along with the authors' search for the development of an effective musical dialogue. Thus, we quote an exchange between Kublai Khan and Marco Polo (CALVINO, 1978, p. 22-23):

> each piece of information about a place recalled to the emperor's mind that first gesture or object with which Marco had designated the place. The new fact received a meaning from that emblem and also added to the emblem a new meaning. Perhaps, Kublai thought, the empire is nothing but a zodiac of the mind's phantasms.
>
> "On the day when I know all the emblems," he asked Marco, "shall I be able to possess my empire, at last?"

> And the Venetian answered: "Sire, do not believe it. On that day you will be an emblem among emblems."

Thus, Polo's narratives, as reported to Khan in *Le città invisibili*, and the subtlety of the fortepiano in *Invisible Sounds*, reflect an invisible thread connecting countless possibilities of dialogue - the ability to build, through collaboration and goodwill, an infinite mosaic of meanings emerging from the human capacity to evolve through exchange and, above all, by listening to others.

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