

# Informed Play

Approaching a Concept and Biology of Tone  
Production on Early Modern Lute Instruments

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Robin Rolfhamre



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OF TONE PRODUCTION  
ON EARLY MODERN LUTE INSTRUMENTS

ÇAPPELEN DAMM AKADEMISK

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# Introduction

Tone production is that particular moment when sound is initiated and set free, developing the sounds necessary to present an audible experience. It is a topic that is highly subjective, debated and discussed, which can only exist in relation to the socio-cultural context in which it is being produced. With such a central phenomenon at hand, I ask in this book: ‘how can we understand tone production on Early Modern lute instruments before the 1700s?’

Although there are numerous words used to speak about sound (including terminologies such as ‘tone production,’ ‘timbre,’ ‘tone colour’ and ‘frequency construct’), I find that tone production is the most apt for the argument I wish to present. This is because ‘tone’ (n.) has an inherent sense of a physically-produced sound that mediates something; consider its relations to Old French *ton* (musical sound, speech, words) and to Latin *tonus* (a sound, tone, accent), which again stems from Greek *tonos* (vocal pitch, raising of voice, accent, key in music), originally ‘a stretching, tightening, taut string’. Hence, ‘tone production’ can be said to be the production of a sound that is produced physically (cf. stretching, tightening, taut string), having a sense of something to be mediated (cf. speech and words, especially considering the sense of ‘manner of speaking’ present around the seventeenth century).<sup>1</sup> As a result, tone production has a discursive function that easily opens up for a different socio-cultural debate than similar terms such as ‘tone colour’ and ‘timbre,’ where ‘colour’ is more perceptually and emotionally charged (from Old French *color*; ‘colour, complexion, appearance’), while ‘timbre’ is more scientifically charged

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1 Online Etymology Dictionary. ‘Tone,’ *etymonline.com*. Retrieved 18 September 2017, URL: [http://www.etymonline.com/index.php?term=tone&allowed\\_in\\_frame=0](http://www.etymonline.com/index.php?term=tone&allowed_in_frame=0).

(from French *timbre* ‘quality of a sound’). This book presents perspectives, theories and reflections on the subject by placing tone production on lute instruments in relation to historical and present approaches and perspectives.

Although the lute is perhaps not the first thing that comes to mind when thinking of the music market today, it is nonetheless present in the social and musical community. The instrument enjoyed a revival with the awakening of interest in historical music around 1900 and throughout the twentieth-century. That revival was further boosted by the Early Music Movement in the same century. There are many professional lutenists, especially in Europe, where most of the employment is found and lute performance practise has reached considerable heights in recent years, thanks to a growing number of world-class lutenists, such as Rolf Lislevand, Hopkinson Smith, Paul O’Dette, Miguel Yisrael, Xavier Diaz Latorre, Robert Barto, Nigel North and Anthony Bailes. We can also take note of many guitarists switching over to the lute, and many of them continue practising guitar techniques on the new instrument, thus perhaps not fully exploring the sonic and expressive capacities inherent in the instrument. Many guitarists prefer to play the theorbo as it, most often, is single-strung and therefore suits the modern guitarist’s nail-based technique better than the double-strung instruments.<sup>2</sup> There is, however, an increasing number of musicians who fully convert to becoming lutenists and there seems to be an expanding global market for lute performance. This statement is supported by the proliferation of teaching institutions offering lute performance studies,<sup>3</sup> the number of lute societies,<sup>4</sup> as well as the increasing amount of publications treating lute-relevant subjects. Lute instruments have, in recent years, started to become an expected part of the continuo ensemble in accordance with historical sources, and

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2 *Liuto forte* is an example of this - it is a type of adapted lute to suit guitarists using guitar-technique.

3 For instance: University of Agder, Norway; Royal College of Music, Stockholm, Sweden; Conservatoire National de Toulouse, France; Staatliche Hochschule für Musik in Trossingen, Germany.

4 The Lute Society of America, The Argentine Society for Lutes and Early Guitars, The Austrian Lute Society, The Belgian Lute Society, Czech Viola da Gamba and Lute Society, The Dutch Lute Society, The French Lute Society, The German Lute Society, The Italian Lute Society, to name only a few. For further details; see: The Lute Society of America. ‘Links,’ [lutesocietyofamerica.org](http://lutesocietyofamerica.org). Retrieved 20 May 2015, URL: <http://www.cs.dartmouth.edu/~lsa/links/index.html>.

we can see an increasing number of productions of Early Modern operas, staging of music theatre and ballets, all incorporating and relying on the continuo group. So, there is indeed a need to address tone production, the very foundation of a lute performance's *ethos*, *pathos* and *kairos*, in full.

## Previous work

I wish to present arguments that are directly usable for the performer as well as the scholar. Much published information can be found, but it is scattered (throughout articles, magazines, etc.) and often distinguishes between historical and practical approaches. Furthermore, the literature is often very traditional in its approach, focusing mainly on fingering and experience-based perspectives on performance practices; there is often more emphasis on how something should be played than how it sounds (as will be discussed in full in later chapters). Some scholars are, for instance, not performers and sometimes miss out on important perspectives closely connected to the highest, international-level performances in their research on music performance. Additionally, many prominent performing lutenists do not publish their experience in writing, meaning that their knowledge is only accessible through personal tuition. A few attempts have been made in recent times to present effective methodologies for learning lute practices but they are, more or less, solely designed to provide 'do it like this' solutions and do not include more complex perspectives, such as physics and psychology; neither do they present their work in a format that supports and develops academic theoretical perspectives.<sup>5</sup> Books treating the Renaissance lute are in a clear majority. Online resources include, for instance, Stefan Lundgren's online tutor,<sup>6</sup>

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5 See for instance North, N., *Continuo Playing on the Lute, Archlute and Theorbo* (Indianapolis: Indiana University Press, 1987); Weigand, G., *Lute Improvisation* (Shattinger International Corp, 1977); Poulton, D., *A Tutor for the Renaissance Lute* (England: Schott & Co. Ltd., 1991); Lundgren, S., *The Baroque Lute Companion oder 'Galanthe Methode, die Laute zu tractieren'* (München: Lundgren Editions, 1993); and Damiani, A., *Method for Renaissance Lute*. Eng. trans. Doc Rossi (Italy: Ut Orpheus edizioni, 1999).

6 Lundgren, S.O., 'Lesson Two', *Lute Online*. Retrieved 31 July 2017, URL: [http://www.luteonline.se/lesson\\_two\\_1.htm](http://www.luteonline.se/lesson_two_1.htm).

David van Ooijen's YouTube channel<sup>7</sup> and Simone Colavecchi's YouTube channel.<sup>8</sup>

Taylor (1978)<sup>9</sup> addresses tone production on the Classical guitar, but only limited amounts of its contents can be transferred to the lute. Indeed, the lute offers certain complexities that are not of interest to the modern Classical guitar. For instance, it makes a difference on the Baroque guitar where you place the finger between two frets — the sustain of the tone can indeed be reduced by up to a fourth of its potential duration — while on the modern Classical guitar, the tone remains the same independently of the finger's position (see Chapter 4).

On other occasions, it may be equally easy and effective to turn to historical works, but, with some exceptions, they almost never talk clearly about tone production. Only a few approach the subject, but not to an extent that sheds much light on the performer.<sup>10</sup>

Of course, there is a great amount of experience and knowledge preserved in audio and film recordings by high-level international performers of Early Music, but these recordings can often prove difficult to turn into practical knowledge to implement in one's own playing, mainly because of poor recording quality and a certain distance to the performer, making it difficult to perceive what they are actually doing without much prior knowledge of that particular artist's practice.

Additionally, some areas within Early Music performance are scarcely treated at all. For example, the *chitarra battente* has only recently been treated in a practical, although quite limited, method;<sup>11</sup> and the *colascione* is only treated fully in one large scale work.<sup>12</sup> In the case of the latter, there are some minor articles, theses and dissertations that mention the

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7 *Lute Lessons* [YouTube channel]. Retrieved 6 September 2017, URL: <https://www.youtube.com/user/LuteLessons>.

8 *luteplayer80* [YouTube channel]. Retrieved 6 September 2017, URL: <https://www.youtube.com/user/luteplayer80>.

9 Taylor, J., *Tone Production on the Classical Guitar* (London: Musical News Services Ltd, 1978).

10 See for instance Mace, T., *Musick's Monument ...* Early English Books Online Editions, ProQuest (London: T. Ratcliffe and N. Thompson, 1676).

11 Loccisano, F., *La chitarra battente*. Con DVD (Granarolo dell'Emilia: Fingerpicking.net, 2015).

12 Depalma, E., *O re di li stromiente: Il colascione nelle fonti musicali, letterarie e iconografiche* (Lecce: Edizioni Grifo, 2010).

*colascione*, but few of them present much directly-incorporable data for the practicing performer. The need for presenting a work that brings together various relevant disciplines through reflection and practical advice across the entire lute instrument family is evident.

## The ambition

It is my strong opinion that interdisciplinarity is the way to go for Early Modern music performance studies. The problem we meet is how to ensure that the study is indeed interdisciplinary and not only parallel-disciplinary; i.e. how to join the knowledge of several fields together without losing the precision of the argument and without presenting two or more separate, parallel discourses. Furthermore, I am very interested in how artistic practice and traditional academic research can work together to produce knowledge. To me, this is crucial for developing arguments, theories and practices that are interesting and directly useable for musicians, while preserving the academic dimensions and giving the research the proper scientific attention. The present book functions as a sort of meta-argument, from which we can better understand lute tone production from a biological point of view and its morphological aspects. The ‘biology of lute sound’ is a perspective I developed in my earlier study, *Dissecting Transformations: Towards a Biology of Recorded Lute Sound*,<sup>13</sup> and it suggests that recorded lute sound (or simply ‘lute sound’ in this present context) is something that evolves over time and is not necessarily a fixed description of the present state. By learning more of this interdisciplinary process, we can better understand what a concept of tone production on Early Modern lute instruments may be and how it might develop. By learning more of this interdisciplinary process, we can achieve a state of informed play, where our tone production is not only something we have learned from others but something we have developed ourselves. Informed play can enable us to contribute to new perspectives on lute performance and place ourselves within the very process of artis-

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13 Rolfhamre, R., ‘Dissecting Transformation: Towards a Biology of Recorded Lute Sound.’ *Studia Musicologica Norvegica* 40 (2014): 43–62.

tic development. The book will not be a traditional ‘how to’ manual or DIY service, but rather a source of reflection, enabling the reader to form their own opinion and implement their own approach to performance. By writing this book, I wish to contribute to setting a new standard for what can be expected from a lute performer’s development of their own tone production, and I wish to provide a new perspective on what can be taught at lute courses worldwide.

## How to use this book

The formulations ‘informed play’ and ‘artistic approach to research’ are important keys to understanding and using this book. There will be no definitive answers on how to do things properly; there will be no definitive methodology teaching the right and only way to play. What will be offered, however, is a pool of perspectives, facts and sources from which the reader can make up their own mind about what constitutes a good lute sound; hence, ‘informed play.’ Furthermore, a practice will be presented in which traditional, academic scholarship works hand in hand with musical performance to unveil perspectives that may be lost when only considering the written word. When practical considerations are addressed, I will present arguments based on my own approach to lute playing through case studies of my own instruments. This will be done based on a certain line of thought and foundation of source materials which will give the reader an opportunity to judge for themselves, instead of directly offering a ‘Rolfhamre school of playing.’ This is further grounded in the book’s focus on *tone production*, rather than *playing technique*. Fingerings, i.e. which finger to use and when, are approached when necessary to the argument, by focusing on the sound they produce rather than the efficiency and ergonomics of their execution.

The main value of this project lies in the combination of an experience-based discipline with an academic one. Following such an approach, other values are gained: 1) the introduction of a more systematic, reflective approach towards tone production; 2) highlighting of perspectives relating in particular to playing the lute at a professional level; and 3)

a contribution to increased competence among lutenists and scholars researching lute instruments, both concerning what is entailed in the different perspectives and what each perspective can contribute to the others.

It is then possible for various types of readers to utilise this book in several ways. Firstly, scholars may be interested in the scientific approach of the book, exploring artistic research as a scholarly practice; obtaining new perspectives on historical music practices; and using it as a handbook to better understand the practical side of lute playing. Secondly, educators and students at institutions around the world may incorporate this book into their tuition, both as support for the course content and as course curriculum. Thirdly, professional lutenists globally may gain new perspectives and inspiration for their own practice, contributing to their artistic development. Finally, amateur lutenists across the globe who are not following any formal course may utilise this book to guide their work. The book naturally follows an argument from beginning to end, but each chapter can be used separately in a course of study, making the book flexible. A sound-recording course curriculum may, for instance, be more interested in Chapter 6, while a beginning lutenist may be more interested in starting with Chapters 2 and 3. The more advanced, intermediate or professional lutenist may find new perspectives in Chapter 4 and 5. These are just a few of the possible approaches to the book.

## Foundation

A study related to historical practice and how that can be realised today depends completely on the foundation from which it emerges, i.e. the common ground on which various discourses, aesthetics and ideologies can start to form. Naturally, in order to justify the arguments that I am presenting here, I find it necessary to present the research foundation which underlies those arguments, in order to clarify the framework in which the argument will unfold. In this section, I will give a brief presentation of how sources and literature, instruments, my own musicianship, and some of my earlier publications have contributed to this book.



## Sources and literature

An obvious start for any historical inquiry is, of course, literature and sources, which we can divide into original primary sources, secondary sources, literature and practical instructions. Primary sources can be thought of in different terms. Writing about music, for instance, the musical score can be considered a primary source, while literature describing the music can be termed secondary sources. According to Yale's *Primary Sources at Yale* website:<sup>14</sup>

Primary sources provide first-hand testimony or direct evidence concerning a topic under investigation. They are created by witnesses or recorders who experienced the events or conditions being documented. Often these sources are created at the time when the events or conditions are occurring, but primary sources can also include autobiographies, memoirs, and oral histories recorded later.

The functional definition of primary sources in this book will be based on Yale's definition, i.e. that primary sources provide first-hand testimony or direct evidence concerning the topic under investigation. This would, in the present context, include sources such as musical notation (handwritten manuscripts, engravings and prints) and pedagogical material (historical documents describing how to play an instrument). Due to matters concerning copyright laws, I have chosen to write the examples of music in my own hand. Given that it is the content of the music — not the actual handwriting, print or engraving — that is being considered in this book, it should not present any problems to the interpretation nor the understanding of the given examples.

Secondary sources include documents or recordings that relate to or discuss information originally presented elsewhere. These would then include publications such as letters, poems and encyclopedias.

Literature includes modern scholarly publications treating Early Modern practice. I have focused my corpora of literature mostly on English-language publications, but I have also studied and reviewed

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<sup>14</sup> Yale University, 'Primary Sources,' [www.yale.edu](http://www.yale.edu/collections_collaborative/primarysources/primarysources.html). Retrieved 29 February 2016, URL: [http://www.yale.edu/collections\\_collaborative/primarysources/primarysources.html](http://www.yale.edu/collections_collaborative/primarysources/primarysources.html).

relevant publications in French, Italian, German and Spanish. In all instances where I have referred to non-English texts, the translations are my own, unless otherwise indicated. I do not claim to present translations that do justice to the tone and original syntax of the literature from a linguistic perspective, but merely to present functional translations that mediate the intention behind the written words. To give the reader the benefit of judging the translation themselves, I will present both the original text and its translation throughout the book. I have tried to keep the transcription of the original texts as accurate as possible, but I have taken the liberty to alter certain typographical letters, such as ‘v’ to ‘u’ and ‘vv’ to ‘w’, where appropriate, for the sake of clarity. Where *The Burwell Lute Tutor* is concerned, the original is very hard to read. I have therefore made the decision to refer readers to Thurston Dart’s translation of it into modern English<sup>15</sup> to make it easier for the reader to comprehend. I have compared his translation to the original and, where nothing else is stated, I agree with his solutions. The same applies to other instances where the translations of others have been included.

Practical instructions include modern publications directly treating a handicraft, such as how to play lute instruments and how to perform music. Common for practical instructions is that they are often based on the author’s own experience and personal idiolect, rather than on fully-presented academic arguments.

The hierarchy of these sources throughout the book, for the sake of the argument I wish to present, will be:

1. Primary sources
2. Secondary sources
3. Literature
4. Practical instructions

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15 Dart, T., ‘Miss Mary Burwell’s Instruction Book for the Lute.’ *The Galpin Society Journal*, 11 (May, 1958): 3-62.

## Instruments

The book also has an artistic-performance aspect to its research foundation. The instruments used for the practical studies are from my own collection. There are several reasons for this: 1) my approach is founded on a principle that we do not necessarily buy good sound (of course, there are quality differences between instruments and makers), but that it is rather a matter of how we use the instruments; 2) instruments can be expensive and a successful approach to tone production should be grounded in the performer rather than the object; a lutenist playing at a concert is judged on their performance ‘here and now,’ not based on what instrument they may acquire in the future; 3) by using the instruments I have at my disposal at home, I simulate the situation of most readers and therefore the argument of informed play and an artistic approach to research becomes more valid and useful in practise; and finally, 4) I do not find it necessary for the academic argument of the book to use original instruments found in museums. This is because many of them are not playable and their present state corresponds to their lifespan. Some instruments are restored by modern luthiers, but then again, we cannot speak of the ‘original sound’ for the reasons already stated. Modern instruments are in themselves interpretations made from historical evidence, based on the luthier’s understanding, knowledge and artistic agenda; they do not necessarily correspond to what was actually used in the Early Modern era. Modern instruments are also based on a modern perception of what sounds good and what feels good when playing.

## My own musicianship

Always when dealing with the performance of musical traditions long gone, there are inevitable subjective and intuitive aspects to how a musical performance presents itself. This is not always easy to put on paper, and the ‘ear’ of the beholder plays a crucial role in this process. I will, therefore, present relevant aspects of my own musical background to clarify the perspective which forms the foundation of my readings, interpretations, expectations and understanding.

As a guitarist and lutenist, I was primarily formed by my teachers and mentors, ranging from the beginning of my studies with Theodor Holmer at the Public Music School in Haninge, Sweden, to high school studies at Södra Latin in Stockholm, Sweden, with Bo Hansson and Jan Risberg, to my University-level degrees at the University of Agder, Norway, where I studied with Per Kjetil Farstad and Jan Erik Pettersen. In recent years, Rolf Lislevand has also functioned as an important source of input in my development as a lutenist, which of course has had implications for my approach towards perspectives related to Early Music aesthetics, playing technique and performance.

Additionally, my understanding of Early Modern music (and music in general) stems from my interest in the breaking point between ‘Early Modern art-music’ (for want of a better term) and what we today label as ‘folk music’. This is an approach based on a pragmatic ideology that I have developed throughout my artistic career based in Scandinavia, and through my studies in music performance (Bachelor’s and Master’s Degrees) and research (PhD) — where sound and emotion are favoured before traditional schools and the nearly impossible: complete accuracy.

What’s more, being an Associate Professor at the University of Agder and teaching lute instruments, among other things, has put me in the position of constantly needing to analyse my own approach towards lute playing and tone production, to be able to direct my students properly.

## My earlier publications

Part of this book has been presented beforehand in earlier versions. Chapter 6 is a combination and reworking of two previously-published papers, ‘Dissecting Transformation: Towards a Biology of Recorded Lute Sound’<sup>16</sup> and ‘Compact Disc(losure): Some Thoughts on the Synthesis of Recording Technology and Baroque Lute Music Research.’ Both are used with permission from the journals in which they were published.

Some selected, short passages retrieved from my doctoral dissertation, *The Popular Lute: An Investigation of the Function and Performance of*

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16 Rolfhamre, *Dissecting*.

*Music in France Between 1650 and 1700* (2014), have been utilised here and there in highly-revised, reworked and recontextualised versions.

## Structure

Chapter 2 addresses the historical perspective, introducing English, Italian, French, German and Spanish sources. The purpose of this chapter is to map out what contemporary materials have been published and what they do, or do not, unveil.

Chapter 3 turns to modern literature and handbooks to address the status of modern lute technique, what is being said about tone production in modern handbooks and instructions on lute play, what literature there is and what can be found online.

It is also important to understand how sound is created on lute instruments and how we can relate to that phenomenon. In Chapter 4, I will address matters relating to the physics of sound, including lute construction and function, string properties, how string materials influence tone production, and how their properties change over time.

Chapter 5 will raise some psychological perspectives, through which I wish to address relevant matters relating to perspectives such as social influence and learning, perception, attitudes, values and inter-group relations. This is to put tone production into a human perspective, focusing on how our perception of good tone production is formed, not only from knowledge but also from inter-human relations, to become self-expressive acts.

Another important aspect for many performing lutenists is how they maintain and nurture their tone production through the recording medium. In Chapter 6, I will address the relationship between the lute and recording technology, and discuss the recording as a mediator of scholarly work. This will be followed by discussions on both technological and performance-practical considerations.

In the final conclusion, I draw everything to a close, focusing on the conceptual and biological perspectives of tone production, and I attempt to conclude the process itself and propose a context in which my argument can be further utilised by colleagues.

## Acknowledgements

Before the book fully unveils, there are some people I wish to thank for their support, input and guidance. First of all, I would like to extend my gratitude to Rolf Lislevand, for his support and feedback. Several of the important perspectives presented in this book were born during our conversations, and it has been valuable indeed to gain access to his far-reaching experience and knowledge. I am also grateful for being able to test my theories and ideas in practice with my current lute and guitar students at the University of Agder. Furthermore, Anne Haugland Balsnes deserves a great thank you for reading the manuscript and providing her comments prior to submission to the editor. Support has also been given by one of my current PhD students, Inga Marie Nesmann, who has provided support and feedback. My dear friend and colleague, Per Kjetil Farstad, has been there and supported me all the way from my Bachelor's Degree and Master's Degree, throughout my PhD and now finally as my colleague at the University of Agder, Faculty of Fine Arts, Department of Classical Music and Music Education; thank you! Additionally, Are Skisland at the University of Agder Library has been a great help in getting the necessary material and literature for the book. My gratitude extends to Lars Aase at Portal Forlag for believing in this project and providing support in the early stages, before they became part of Cappelen Damm Akademisk, where my current editors, Simon Aase and Katia Stieglitz, took over responsibility for the book; thank you, all three of you. Finally, I wish to say thank you to the University of Agder, Faculty of Fine Arts and the University of Agder Open Access Publication Fund for funding production of the book and granting me the time to write it.



# Building blocks of the past

In dealing with historical practice, we must always relate ourselves — either by embracing or renouncing the fact — to what was common practice at the time. In historical practices related to musical performances this is indeed difficult, and the earlier the music, the more overwhelming and impossible the task may seem. Attempts to gain some understanding of common practice at a given time is a complex matter and a range of sources must be reviewed together. This is not only true within a given performance tradition, but also in how it is preserved through time. The difficulties relating to Early Modern sources are greatly increased as the scribes did not necessarily have the required competence on the matter they were instructed to document. In Medieval manuscripts and codices, for example, the neumatic notation presents a clear example of this as it gave rise to the *musica ficta*<sup>1</sup> tradition, in which it was left to the performer to alter the written pitch according to the mistakes of the scribe. As an additional layer upon this we also find our own understanding and interpretations of the same sources, but these matters will be delayed until later chapters (particularly Chapter 5). In this chapter, I will present an overview of historical sources directly discussing or indirectly mediating matters related to tone production. From these indications, we are given the necessary building blocks to construct a conceptual understanding of tone production during the course of later chapters. It should be mentioned that my focus in this chapter is more of a practical nature than a theoretical one, and so I have chosen to look at tone production as related to instructions in performance contexts (i.e. introductions presented in

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<sup>1</sup> See 'Musica Ficta,' *The Oxford Dictionary of Music*, 2nd ed. rev. *Oxford Music Online*. Oxford University Press. Retrieved 8 June 2017, URL: <http://www.oxfordmusiconline.com/subscriber/article/opr/t237/e7078>.



tablatures and lute handbooks), ignoring strictly theoretical works from the period (encyclopedias and music-theoretical works, for instance). This is for two reasons. Those writing about music are not necessarily the same as those performing it, and theory is not automatically the same as practice. Besides, theoretical works are driven to a greater extent by adjectives which are much more difficult to translate for the modern performer (e.g. what is ‘melancholy,’ ‘grace’ and ‘heavenly,’ to whom, and at what period in time?), making directions such as ‘place the finger here’ more fruitful to use as building blocks for the discussion of the remaining chapters of this present book. In this chapter, I will organise the material according to three main perspectives:

1. *Literature*: historical writings on lute-related performance practice, focusing on the right hand.
2. *Visual arts*: statistical developments in visual representation of right-hand positions in works of art.
3. *Fingering*: selected perspectives focusing on tone production.

## Literature

The English sources are those which speak most clearly about tone production. Rough times and alteration of practice are good for scholars, because they are reasons which inspire authors to write more clearly about musical performance activities. Indeed, if something is axiomatic, or common practice, one need not write about it. Evidently, the lute had lost some of its favour in the seventeenth century, as several English authors put lute practice into writing. As John Playford (1666), for one, puts it: ‘*Therefore to revive and restore this Harmonious Instrument, I have adventured to publish this little Book of Instructions and Lessons [...]*’.<sup>2</sup> In fact, the sources discussing right-hand positions and tone production outside of England are so scarce that I have chosen to base this section on the English sources, only to introduce foreign perspectives when surviving literature and tablatures make it relevant. The most detailed

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<sup>2</sup> Playford, J., *Musick's Delight on the Cithren ...* (London: W.G., 1666), Preface (2nd page).

descriptions are, as in many other matters concerning the lute, provided by Thomas Mace (1676) and *The Burwell Lute Tutor* (c. 1670). I will further direct attention to William Barley (1596), who also introduces the Bandora and Orpharion, and one remark by John Playford (1666). Among the sources outside of England, we find some scattered bits and pieces. These include, for instance, Capirola (c. 1517), Kapsberger (1640), Sanz (1697) and Corbetta (1671 and 1674). Note that the sources presented here are all but two from the seventeenth century, when other instruments such as the harpsichord started to gain popularity over the lute.<sup>3</sup> What's more, the fragmented nature of the information across all sources — except perhaps that given in *The Burwell Lute Tutor* and Mace — indeed presents us with two realities. One being what is *not* said; in a time where manuscripts, engravings and exclusive printing are expensive and time-consuming processes, one needs not waste time and money to document the obvious, the consensus and standard practice. The other being what *is* said, that is, what is not obvious, what is not standard practice and what is not general consensus. This also applies to the introduction of new ideas where the author wishes to alter standard practice through innovation or for other reasons. In this sense, the decline of traditions is good for scholars as it impels the production of documentation, leaving us something to work with.

The first subject addressed by the sources, which I will present here, is the shape of the instrument; the second is the right-hand position, and the last is how to utilise the right hand.

## The shape of instruments

Information regarding the form and shape of instruments remains in various formats, including surviving instruments, encyclopedias and theoretical works, but information about the sonic and performance-related consequences that certain designs afford are rarer. *The Burwell Lute Tutor*, copied from John Rogers by Mary Burwell around the 1670s, presents two

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3 Ledbetter, D., *Harpsichord and Lute Music in 17th-Century France* (London: The Macmillan Press Ltd, 1987).

major shapes which have their separate benefits. One is better for sound and the other is more comfortable to play on. This distinction between the two is interesting as they are presented as opposites, making the performer choose between execution and aesthetics:

[...] there is a great dispute amongst the moderns concerning the shape of the lute. Some will have it somewhat roundish, the rising in the middle of the back and sloping of each side, as we see [in] the lutes of Monsieur Desmoulins of Paris [...]. The reason is that the lute so framed is capable of moore sound because of his concavity, and that the sound not keeping in the deep and hollow bottom but, contrariwise, being put forth by the straitness of the sides towards the middle and so to the rose, from whence it issues greater and with more impetuosity. The other have for their defence and reason the handsomeness of the pear, [and] the comeliness of it — because, being more flat in the back, they lie better upon the stomach and do not endanger people to grow crooked. Besides all Bologna lutes are in the shape of a pear, and those are the best lutes; but their goodness is not attributed to their figure but to their antiquity [...] The lutes of Padua are something roundish and like those of Monsieur De[s]moulins; therefore their sound is greater than those of Bologna, which are very sweet.<sup>4</sup>

Mace (1676), on the other hand, prefers pearl-shaped lutes as they are both well-sounding and sit comfortably on the performer: ‘The *Shape* generally esteemed, is the *Pearl-Mould*; yet I have known very excellent *Good Ones* of several *Shapes* or *Moulds*: But I do acknowledge for constancy, the *Pearl-Mould* is *Best*, both for *Sound*, and *Comliness*, as also for the more conveniency in *holding* or *using*.<sup>5</sup> We see numerous inventions during the course of time where new sounds, user experiences and sonic ranges are sought. Examples include Kapsberger’s nineteen-course chitarrone, to which he devoted his *Libro quarto d’intavolatura di chitarone* (1640),<sup>6</sup> Mace’s double lute, the *dyphone*, presented in *Musick’s Monument* (1676)<sup>7</sup> and Jacques Gaultier, who promoted the two-headed, twelve-course Baroque lute. The latter is directly mentioned in *The Burwell Lute Tutor*,

4 Dart, *Burwell*, 10–11.

5 Mace, *Monument*, 49.

6 Kapsberger, G.G., *Libro quarto d’intavolatura di chitarone* (Roma, Giosepe Pozzobonelli, 1640).

7 Mace, *Monument*, 203.

where its sonic qualities are criticised. According to what is written, the trouble seems to be due to the inequality between the trebles and basses. It is particularly worth noting the nasal quality of the long basses because of the directions to place the right hand close to the bridge, which causes a more metallic yet woody tone quality. Perhaps this is also the reason behind the following comment, as we can see how the combination of a metallic tone quality and a nasal bass string may not have been a fruitful match, but this we will never know:

English Gaultier [[a contemporary lutenist]] hath been of another opinion and hath caused two heads to be made to the lute. [...] The reasons of English Gaultier are so feeble that they destroy themselves. First, he saith that the length of the strings produce[s] a longer and bigger sound. But all the strings ought to have the same length of sound, and the sound of a string must make room to the other; for besides the confusion that the length of sounds produce, it also causeth a discord (since every bass cannot make a concord with every small string). And this is the first reason. The second evil effect that condemneth this alteration is that the sound of these long strings are no good, and that sound is like that of one that sings in the nose.<sup>8</sup>

## Right-hand position

Although authors aside from Burwell and Mace show little interest in the matters concerning lute design, we find slightly more interest directed towards the right-hand position. This may be because the lute performer had little influence on the design of their instrument (perhaps it was second-hand or the luthier only used one or two standard moulds, making the selection rather simple and restricted). In general, there seems to be a consensus about the placement of the right hand, at least in the later seventeenth-century sources (the Renaissance practice will be better unveiled later in this chapter). *The Burwell Lute Tutor* asks for the hand to be placed close to the bridge, using the little finger as support. The wrist should be high to produce an arch and the nails must be short:

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8 Dart, *Burwell*, 59.

For the right hand, it must be placed between the rose and the bridge, but nearest to the bridge. Your hand must lie upon the belly of the lute with the little finger only, which must be as if it were glued unto it; and keep the thumb as much as one can leaning upon the bass. That hand must be rising in the middle in the form of an arch, [so] that you may not smother the strings. [...] For the nails, they must be short and smoothly cut (which some do with a little file).<sup>9</sup>

This view is also shared by Mace (1676), who mentions the same attributes. What Mace does, however, is to give more detailed information (as is often the case) as to how the strings are indeed to be plucked; an important indicator here is that, as mentioned in *The Burwell Lute Tutor*, the thumb should rest on the bass string. This serves to give support and a necessary reference for the performer to find their way among the many basses (since the subject for discussion in both books is the eleven-course Baroque lute and occasionally the fourteen-course theorbo). With the little finger placed firmly on the lid, the thumb resting on one of the basses, the wrist held high and the whole hand being situated close to the bridge, we get a pretty good idea of the foundation for the later seventeenth-century concept of tone production:

Lastly, That in *This Posture of your Right-Hand, your Right-Hand Wrist, rise up, to a Convenient Roundness; yet not too much, but only to an Indifferency, and to keep it from Flatness, or Lying o long, &c.* [...] And as to that *Work*, it is only (first) keeping your *Thumb straight, and stiff, and gently pressing down that String, (with an easie strength)* so, as your *Thumb* may only *slip Over it, viz. That Pair*; (for you must know, that always the *Pairs, are struck together*) and rest it self upon the *next (or Eleventh) String*, your *Thumb* then standing *ready, to do the like to That String*; and so from *String to String*, till you have serv'd all the row of *Basses* after the *same manner*. [...] But *This* you must *remember, viz.* when ever you *strike a Bass*, be sure, you let your *Thumb rest itself, upon the next String*, and *There* let it *remain*, till you have *Use of It* elsewhere. // And this is the only way, to *draw from a Lute (as we term it) the sweetest Sound, that a Lute is able to yield*; which being perfected, you may conclude, *half the work of your Right Hand accomplished.* [...] with your *Thumb* ever *resting* upon some

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<sup>9</sup> Dart, *Burwell*, 23.

one of the *Basses*, (where you please) put the *End* of your *second Finger*, a *very little* under your *Second String*, (about three Inches above the *Bridge*) as if you did intend only to *feel your String*, having your *Fore-finger* (at the same time) *close adjoining* in readiness, (yet not touching your *second Finger*, or the *String*;) then draw up your *second Finger*, from under the *String*, forcing the *String* with a pritty *smart Twitch*, (yet gently too) to cause it to speak *strong* and *Loud*. [... Repeat until] you can draw a *sweet, smart*, and *pleasant Sound* from *That String*. [...] strive to do the like with your *Fore-finger*, [...].<sup>10</sup>

The earlier William Barley, in his *A New Booke of Tabliture ...* (1596), is much more scanty in his documentation, but what he writes supports the same notion as described above:

[...] the stringes must bee stroken beneath on the bellie of the Lute, with the finger of the right hand, as wel as stopped with the fingers of the left.<sup>11</sup>

This hand position is even further supported by John Playford in his *Musick's Delight on the Cithren ...* (1666). What Playford does is to bring the metal-strung instruments into the discourse, and it is noticeable that he prefers the use of the fingers rather than the quill (cf. the Oriental *rishā* or the modern plectrum, etc.):

[...] For your right hand, rest only your little finger on the belly of your *Cithren*, and to with your Thumb and first finger and sometimes the second strike your strings, as is used on the *Gittar*; that old Fashion of playing with a quill is not good, and therefore my advice is to lay it aside; and be sure you keep your Nails short on the right hand.<sup>12</sup>

The German sources are scarce, but we find that Johann Stobaeus' (or Stobäus') *StammBuch* (c. 1638–1640) promotes a move from the thumb-inside to the thumb-outside technique. The thumb should be stretched out and the fingers should be played inwards to produce a clean, strong sound. The thumb-outside technique is said here to produce a sharper, brighter and purer tone quality which is to be preferred to the previous

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<sup>10</sup> Mace, *Monument*, 72–73.

<sup>11</sup> Barley, W., *A New Booke of Tabliture ...* (London, n/a., 1596): B3.

<sup>12</sup> Playford, *Cithren*, Brief Instructions to Playing the Cithren (7th page).

thumb-inside technique, which is now referred to as ‘quite rotten and muffled’ (*gar faull u. dümpffig*). Unfortunately, I have not been able to obtain the original source myself, but we find quotes from it on a website provided by Wayne Cripps:

1. Von der Rechten Handt.

“Die Rechte Hand soll kurtz für dem Stege gehalten u. d. kleine finger steif aufgesetzt u. gehalten werden. D. daume soll starck ausgestreckt werden, das er fast ein glied den andern fingern vorgehe. Es sollen auch die finger einwertz unter den daumen fein zu sich gezogen werden, dz der *\_resonans\_* fein starck klinge.

“Der daume soll auswertz nit einwertz, geschlagen werden, wie die Alten zu thun pflegen, u. gemeinlich die Niederländer und Alte Teutschen. Denn es *\_probiret\_* worden, das es weit besser den daumen auswertz zuschlagen, klinget reiner scherffer u. heller, dz ander klinget gar faull u. dümpffig.

“Auswertz gebrauchen den daumen diese Berümbte Lautenisten, *\_In Germania: Gregorius Ruwet [Huwet], d. Dulandus Anglus,\_* welcher doch anfänglich einwendig den daumen gebraucht. *\_In Italia:\_ Zu Rohm *\_Laurentinus,\_* zu *\_Padua Hortensius.\_* *\_In Gallia\_* Borquet , Mercurius Polandus\_ u. andere mehr.*

“Wenn volle griffe zuschlagen, gebraucht man alle 4 finger.

“Wenn *\_Coloraturen,\_* bisweilen mit dem daumen und Zeiger, bisweilen d. Zeiger u. mittelste finger wie drunten bey den *\_Coloraturen\_* soll gedacht werden.”

(1. On the Right Hand.

The right hand is to be held close to the bridge, and the little finger firmly placed and held down. The thumb is to be stretched out strongly, so that it stands out almost as a limb [so that it stands out one knuckle] to the other fingers. The fingers are to be pulled cleanly inwards under the thumb, so that the sound resonates cleanly and strongly. The thumb is to be struck outwards, not inwards like the people in the past used to do, and commonly the Dutch and old Germans. For it has been proved that it is far better to strike the thumb outwards, it sounds purer, sharper, and brighter, the other sounds quite rotten and muffled.

These famous lutenists used the thumb outside: In Germany: Gregorius Ruwet [=Huwet], Dowland the Englishman, who at first used his thumb the other way. In Italy: in Rome Laurencini, in Padua Hortensius. In France, Bocquet, Mercure the Pole, and many more. If you strike full chords, you use all four fingers [=three fingers + thumb]; for divisions, [play] sometimes with the thumb and index finger, sometimes with the index and middle finger, see below under Divisions.) (Translated by Stewart McCoy; amendment by Markus Lutz)<sup>13</sup>

Esaias Reusner, in his *Erfreuliche Lauten-Lust* (1697), mentions the possibility of placing the supporting finger (in this case, the little finger) behind the bridge to produce a strong tone:

An der rechten Hand muß der kleine Finger vor dem Steg gesetzt werden, wann man lieblich spielen wil; soll es aber etwas stärker klingen, kan man auch wol den kleinen Finger hinter dem Steg setzen. Der Daumen muß allezeit, wann er eienen Chor geschlagen, auff dem anderen liegen bleiben. Auff die Verwechselung der Finger muß man auch fleissig Achtung geben.

Was die lincke Hand anbelagt, [...] Ferner sollen auch die Striche, wo man überlegen soll, wol in acht genommen und allezeit die Finger veste aufgedrucket werden, damit es desto reiner klinge [...].<sup>14</sup>

(On the right hand, the little finger must be placed before the bridge when you play pleasantly; but if it should sound a bit stronger, you can also put the little finger behind the bridge. The thumb must always lie at the other end [of the bridge], when it is used to pluck. One must be careful not to confuse the fingers.

As for the left hand, [...] the strokes, too, should be taken into consideration, and the fingers must always be plucked [in a manner] that may sound purer.)

Interestingly enough, Reusner (or Reusnern) does not mention the possibility of playing with the supporting finger behind the bridge in his 1676 treatise: ‘First, the small finger must be positioned somewhat before the bridge [direction, rosette], and not behind, whereby one achieves a sweeter sound [...]’ (in Roland H. Stearns’ translation; brackets added

13 Cripps, W., ‘Stobaeus.’ Retrieved 3 April 2018, URL: <http://www.cs.dartmouth.edu/~wbc/hand/Stobaeus.html>.

14 Reusner, E., *Erfreuliche Lauten-Lust*. 1697 (München: Tree Edition, 1998), Hochgeneigter Leser!



by the translator).<sup>15</sup> Philipp Franz LeSage de Richee (1695) gives similar directions: ‘1. The small right [plucking] hand finger must be positioned in front of the bridge [i.e. toward the rosette side], not behind it. // 2. The right [plucking] hand thumb should extend toward the rosette so that the fingers move into the palm of the hand [...]’ (also in Roland H. Stearns’ translation; brackets added by the translator).<sup>16</sup>

French sources are even more scarce. Without mentioning the position between the rosette and the bridge, Charles Mouton writes in 1698 that the ‘little right [plucking] hand finger must rest on the lute top on the side of the bridge where the strings are tied; the other fingers extend to prepare to play, and the thumb, [further] extends to a position outside the fingers’ (same translator).<sup>17</sup>

Clearly sources agree on the high angle of the wrist and, as in the later sources, also the close proximity to the bridge. Giovanni Girolamo Kapsberger, in *Libro quarto d’intavolatura di chitarone* (1640), take the matter to extremes and, according to my research, it seems that he is unparalleled in his approach. What he asks for is for the lutenist to place, not the little finger but the ring finger on the bridge itself, thus only utilising the thumb, index finger and middle finger for play:

Si deve tenere il quarto deto della mano destra appoggiato al fondo di quà dal ponticello, et non il quinto: le ragioni di ciò si dichiarano dall’Autore, nel suo libro intitolato il Kapsberger della Musica Dialogo.<sup>18</sup>

(One must keep the fourth finger [i.e. the ring finger] of the right hand leaning back to the bottom of the bridge, and not the fifth [i.e. the little finger]: the reasons for this are stated by the Author, in his book entitled *Kapsberger of Musica Dialogo*.)

*The Burwell Lute Tutor* also speaks of three fingers only: ‘The right hand useth the thumb and the two next fingers to the thumb only; [...]’

<sup>15</sup> Lundgren, *Baroque Lute*, 25.

<sup>16</sup> Lundgren, *Baroque Lute*, 35.

<sup>17</sup> Lundgren, *Baroque Lute*, 40.

<sup>18</sup> Kapsberger, *Libro quarto*, 2. The book he mentions seems to be lost; see Fabris, D., ‘Lute Tablature Instructions in Italy: A Survey of the *Regole* from 1507 to 1759,’ in Coelho, V.A. (Ed.), *Performance on Lute, Guitar and Vihuela: Historical Practice and Modern Interpretation* (USA: Cambridge University Press, 1997): 16–46, 28.

You may raise the little finger when you strike a whole stroke with the thumb, striking as you do on the guitar.<sup>19</sup> However, the use of the little finger instead of the ring finger naturally increases the distance from the bridge.

John Baptisto Besardo of Visconti, on the other hand, presents an essay entitled ‘Necessarie Observations Belonging to the Lute and Lute-Playing,’ in Robert Dowland’s publication *Varietie of Lute Lessons ...* (1610). This is a more detailed description, closer to those of Mace and *The Burwell Lute Tutor*, and except for small variations relating to the Renaissance performance and fingering practice, he too concurs (see further mentions of this in later sections of this chapter):

First, set your little finger on the belly of the LUTE, not towards the Rose, but a little lower, stretch our your Thombe with all the force you can, especially if thy Thombe be short, so that the other fingers may be carryed in a manner of a fist, and let the Thombe be held higher than them, this in the beginning will be hard. Yet they which have a short Thombe may imitate those which strike the strings with the Thombe under the other fingers, which though it be nothing so elegant, yet to them it will be more easie.

Now for choosing one of these kindes, learne first to strike the strings more hard and cleare [*sic*], whether they be one or more that are to be stricken: and that you may strike them with the right fingers, marke whether one string or more strings than one are to be stricken: if more then one, keepe this rule, let two strings which stand close together be stroken with the Thombe and fore fingers: if two strings be distant one from another so that there be one or two strings betwixt them, strike them with the Thombe and middle finger: strike also three strings, with the Thombe, the fore-finger and middle finger: foure [*sic*] strings with all the other fingers (excepting the little finger,) if more be to be stroken (as oft there be) keeping the same order with your fingers, let the Thombe and the fore-finger strike each of them two strings, if so many be to be stroken. [...]<sup>20</sup>

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19 Dart, *Burwell*, 29.

20 Besardo of Visconti, J.B., ‘Necessarie Observations Belonging to the Lute and Lute-Playing,’ in Robert Dowland, *Varietie of Lute Lessons ...* (London, Thomas Adams, 1610): 4–11, 9.

## Right-hand plucking

But the placing of the hand is not all, and for sound to be produced something has to move (see Chapter 4), meaning that a string has to be plucked. *The Burwell Lute Tutor* again sets a good example by providing detailed information. Here we read how the strings are to be left untouched when not in use, which on a Baroque lute has much to say for its resonance, and how one must vary one's plucking (close to the bridge) to make it musically interesting. In contradiction to the instructions by Kapsberger, we should never place the little finger upon the bridge:

For the striking of the lute, that concerneth rather the perfection rather than the beginning of the learning; yet in the beginning 'tis to be observed to strike hard and near the bridge. But take heed that you never lay the little finger upon the bridge or behind the bridge, neither strike the strings with the nails, nor so hard as if you would tear them in pieces. But never leave fingers upon the strings (the thumb as much as you please upon the bass. When you begin to play something well, you must alter your way of striking and flatter (as we speak) the lute — that is to strike it sometimes gently. [...] in playing of the lute, in some places you must strike hard and in others so gently that one may hardly hear you.<sup>21</sup>

It is further emphasised later in the book that one should play without nails: 'The grace is in the flesh, and in the touching of it.'<sup>22</sup> Thomas Mace (1676) also agrees with this, as he presents a similar approach where the flesh is preferred to the nails. He does, however, accept the use of nails in the consort for the simple reason of being heard over the other instruments:

But in doing of *This*, take notice, that you *strike not your Strings with your Nails*, as some do, [...] because the *Nail cannot draw so sweet a Sound from a Lute*, as the *nibble end of the Flesh* can do. // I confess in a *Consort*, it might do well enough, where the *Mellowness* (which is the most *Excellent Satisfaction* from a *Lute*) is *lost* in the *Crowd*; but *Alone*, I could never receive so *good Content* from

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<sup>21</sup> Dart, *Burwell*, 23–24.

<sup>22</sup> Dart, *Burwell*, 35.

the *Nail*, as from the *Flesh*: However (*This being my Opinion*) let *Others* do, as seems *Best to Themselves*.<sup>23</sup>

Thomas Mace (1676) is the only one, however, to clearly describe the motion of the fingers. He describes what must be done for a clear and clean tone, but it is difficult to discern exactly what he means by an ‘upwards’ and ‘not slanting’ movement. It may suggest the difference between the free stroke (*tirando*) and the resting stroke (*appuyando*):

And that you may learn to *strike a String Clear, and Clean*, take notice, that in *your stroke*, you strive to *draw your Finger a little Upwards*, and not *Slanting*, for that will *endanger the hitting of another String, together with That String*, you intend to *Strike Single*. This is called *Clean Striking*.<sup>24</sup>

William Barley (1596) writes more than Mace on the matter, but seems more concerned with terminology and fingering than with tone production itself:

[...] you have but foure fingers to play, the thumb accounted for one, for note that the little finger serveth to guide the hand upon the bellie of the Lute. [...] And to the end yee shall not be ignorant what these tearmes meane of striking downewarδες, or upwards, or to gripe, I meane by striking downewarδες the stringes is when the thumb playeth alone, and to strike with the fingers is when the letters hath pricks under them, and the stringes are striken upwardes, to gripe is when the fingers and the thumb playeth together and yet not looseth their office in striking upwardes and downewarδες, that is to say to strike downward and upward with the fingers.<sup>25</sup>

It is not until Barley introduces less common instruments, such as the metal-strung orpharion in *A New Booke of Tabliture for the Orpharion ...* (1596?), that he becomes clearer, and suggests that metal strings must be treated differently than those made of gut:

[...] the Orpharion is strong with wire stringes, by reason of which manner of stringing, the Orpharion doth necessarilie require a more gentle & drawing stroke

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<sup>23</sup> Mace, *Monument*, 73.

<sup>24</sup> Mace, *Monument*, 73–74.

<sup>25</sup> Barley, *Tabliture*, B4.

than the Lute, I meane the fingers of the right hand must be easilie drawn over the stringes, and not suddenly griped [*sic*], or sharpelie [*sic*] stroken as the lute is: for if yee should doo so, then the wire stringes would clash or iarre together the one against the other; which would cause that the sounde bee harsh and unpleasant: Therefore it is meete that you observe the difference of the stroke.<sup>26</sup>

Francesco Corbetta seems to take for granted that the performer knows how to strike the strings in general, which is a logical inference as only a trained musician could perform his complex and technically-demanding works as presented in *La guitarre royalle* (1671). Yet, it is interesting to note a small remark that the hand and wrist must perform strumming in a synchronous manner: *'E batti sempre le consonanti con la mano et il polzo insieme'*<sup>27</sup> (And always hit the chords with the hand and the wrist together).

In Italy, however, Vincenzo Capirola's lute book *Compositione di Meser Vincenzo Capirola* (c. 1517) provides three important directions. The first is that all notes of a chord must be heard clearly; the second is to sustain the notes in the left hand, that is, to hold the fingers to the note until the finger is needed elsewhere in a sort of *'tenuto* left-hand technique' (although I confess, the term is troublesome in the world of tablatures). This can be compared to *The Burwell Lute Tutor*, cited earlier, which may indicate the same: 'But never leave fingers upon the strings (the thumb as much as you please upon the bass).'<sup>28</sup> The third and final direction is that the distance between the string and the nut has much to say for the tone production. Even if Capirola's right-hand instructions are somewhat fragmented (including the description of a *figuetas* technique not cited here) they are interesting because they present three perspectives not clearly addressed by others:

[...] Le consonantie tu troverai a tre over a quatro, evertisi che quella de mezo se sentra, che molto la tua orech//ia te ingana te par sonar 4 bote, et non se sente nisi 3., et cusi 3 che soni non se sente poi do [...] Nota. il piu bel secreto

26 Barley, W., *A New Booke of Tabliture for the Orpharion ...* (London, n/a., 1596?): B. The following and related publication Barley, W., *A New Booke of Tabliture for the Bandora ...* (London, n/a., n.d.) does not mention tone production.

27 Corbetta, F., *La guitarre royalle* (Paris, Bonneüil, 1671), 3.

28 Dart, *Burwell*, 23–24.

et arte che, e, nel meter suxo una cosa, et sonar, abi questo per una masima de aristotille, et fali gran fundamento: avertisi nel sonar sempre tenir ferme le bote col deo, over dei sul manego fina che trovi altre bote che te sia forza lasarlle, cusi sempre farai de man, in man, per che limporta asai, e tuti non livrende, come desoto, forza sera ne parli [...] et nota un miraculo che io viti a un lauto che solena aver: il scagnelin era un poco inzo piu che[?] dover che canto andava inciso, et pareva il lauto muto il fisi andare insu al suo luoco respiro il lauto cosa danno creder [...]<sup>29</sup>

([...] When you find chords with three or four notes, be careful that the middle one is audible, as often your ears will cheat you. You will think you are playing four notes, but actually only three of them will be sounding, or when you play three, only two will be heard.[...] The most beautiful secret in preparing and playing a piece is found in a rule given by Aristotle to which great importance must be given: when you play, be careful to hold the notes, keeping the fingers (of the left hand) on the fingerboard, until you have to play other notes (with the same fingers). Do not move them until you have to; be careful always to observe this rule while you are playing through the pieces. Not everybody understands this as I do, so I had to explain it. [...] Witness the miracle I saw in a lute that I had: the nut was slightly lower than it should have been, the ‘canto’ (1st string) was too low (on the fingerboard), and the lute sounded mute. I raised it to the proper height and amazingly, the lute came alive.)<sup>30</sup>

Similarly, we can also find other perspectives given in Gaspar Sanz’ *Instruccion de Musica Sobre la Guitarra Española ...* (1697) in which the thumb is specially mentioned:

Del pulgar de la mano derecha, es necessario tener grande cuidado, porque como siempre toca la voz baxa, si hallaren dos numeros, aunque sea en las dos

29 Capirola, V., *Composizione di meser Vincenzo Capirola* (na., na., c. 1517), ff. 2 and 4r.

30 I have transcribed the original handwriting here as close to the original as I could manage. Due to the complexity of the text, however, I chose to use Federico Marincola’s contextual adaptation of the text into modern English for the translation. I agree with his solutions, and I find it to better convey the content to the modern reader than a direct translation from the original would have done, especially since more specialised linguistic perspectives are not the focus here, but the subject-related content of the text itself; see Marincola, F., ‘Capirola Lute Book (1517)’ in *Lute-Bot Quarterly* No. 1, Winter (1998). Retrieved 7 June 2017, URL: [http://www.gerbode.net/sources/capirola\\_compositione/luteboti.txt](http://www.gerbode.net/sources/capirola_compositione/luteboti.txt).

rayas mas baxas, procuren que el pulgar toque el bagete, porque le pertenece à èl explicar aquella voz, para que tenga mas cuerpo, y porque no suena tambien la segunda herida àzia arriba con el indice, como con el pulgar àzia abaxo, y pueden probar esta regla en la tercera diferencia de la Xacara, al quarto compàs, y experimentaràs, que alli es mejor tañer la segunda con el pulgar, que con otro dedo, y alsimismo en otros casos.<sup>31</sup>

(Of the thumb of the right hand, it is necessary to take great care, because as always the low voice sounds, if they find two numbers, even in the two smallest lines, try to have the thumb touch the course (?; *bagete*), because it belongs to him to explain that voice, so that it has more body, and because the second wound [string] does not also sound up with the index, as with the thumb below, and can prove this rule in the third variation of the Xacara, to the fourth beat, and you will experience, that it is better to play the second with the thumb, than with another finger, and likewise in other cases.)

As my final example, Alessandro Piccinini (1623) emphasises a clean and clear tone production and directs the reader to play over the rose to render the best sound:

Dico dunque, che frà le parti principali le quali si ricercano al buon suonatore, l'una & molto importante è il suonare netto, & polito; Di maniera che ogni minimo tocco di corda sia schietto, come Perla, & chi non tocca in questa maniera è poco da stimarsi; E certamente gran diligenza conviene usarsi, per suonare così; & in particolare in Francia, dove non si stima alcuno, il quale non suoni netto, e delicate. [...] Rende il Liuto, e così ancor il Chitarrone miglior armonia in mezzo frà la Rosa, e lo scanello; e però in quell luoco si deve tenere la mano destra.<sup>32</sup>

(So, I say, what is the main role that is being sought by the good player, one very important [task] is to play clearly, & clean; In such a way that every little touch of [a] string is fine, like [a] pearl, and they who do not touch it in this manner is of little esteem; And, certainly, great diligence should be payed to play thusly; & particularly so in France, where no one is esteemed, who does not[, through

<sup>31</sup> Sanz, G., *Instruccion de musica sobre la guitarra española ...* (Zaragoza, Diego Dormer, 1697), 7–8.

<sup>32</sup> Piccinini, A., *Intavolatura di liuto, et di chitarrone. Libro primo* (Bologna: Gio. Paolo Moscatelli, 1623), 1.

their playing,] sound clear, and delicate. [...] It makes the Lute, and also the Chitarrone[, produce the] best harmony [when placing the right hand] in the middle of the rose, and on top of it; and therefore, you must hold your right hand in that place.)

A key to producing proper sound, according to Piccinini, is to have the nails short and egg-shaped, yet long enough to provide support for the fleshy part of the fingertips, and that the fingers move towards, that is, into the soundboard. Both strings of each course should be plucked with the flesh.<sup>33</sup>

Per imparare di tener ben la mano destra, chiuderai il pugno, e poi l'aprirai un poco, tanto, che le punte delle dita siano incontra alle corde, & il deto Police stia lungo; & l'Auricolare stia posato sopra il fondo [...] Il deto Police, il qual io non approve, che habbia l'ugna molto longa, s'adopra in questa maniera, cioè che ogni volta, che suonerà la corda, dovrà mandarsi verso il fondo, so che caschi sempre sopra, la corda, che li farà sotto, & iui si fermi sin tanto, che di nuovo dovrà porsi in opera. E quando si suona una pizzicata (che pizzicato intend, quando si suona più d'una corda insieme) anche il Police deve fare il medesimo movimento, e questo molto importa, prima per la buona armonia, che faranno li Bassi toccata à quell modo, & ancora perche apporta commodità grandissima [...]. Le altre tre Dita, cioè Indice, Medio, & Anulare, I quali certamente debbono havere le ungue tanto longhe, che avanzino la carne, e non più, & che habbiano dell'ovato, cioè; che siano più alti ein mezzo; s'adopereranno in questa maniera, cioè; che quando si farà una pizzicata, ovvero, si suonerà una corda sola [...].<sup>34</sup>

(To learn to hold your right hand, you will close your fist, and then open it a little, so that the tips of your fingers meet the strings, and the thumb is long [i.e. stretched out]; and the little finger is rested at the bottom [i.e. the soundboard] [...] The thumb, of which I do not approve when it has a very long nail. U]se it in this way, that is, that every time it plays the course it has to move towards the soundboard [...]. And when you play a *pizzicata* (i.e., when playing more than one course together), the thumb must do the same movement, and this is very important, first for the good harmony, that they will pluck the basses in this way, and also because it provides great convenience [...]. The other

33 Piccinini, *Intavolatura*, 2.

34 Piccinini, *Intavolatura*, 2.



three fingers, that is, the index, medium, and ring finger, must surely have their nails so long that they supports the flesh, and no longer, and that they are egg-shaped, that is, that they are higher in the middle[. W]hen used in this way, that is; when plucking is made, a single course will sound [...].)

## Visual arts

Other valuable sources on the concept of tone production can be found in the visual arts, but they must be treated with care in this context. Paintings are certainly full of uncertainties as they are not photographs, and we are subject to the eye of the artist creating them. A person depicted playing the lute in a certain fashion does not automatically mean that that certain way of playing is what was actually done. The performer may have chosen a more comfortable position to be able to sit for the artist over a long period of time; the performer may not even have been a musician at all, only finding the lute to look good in the painting; the artist may have adjusted, or even changed, the reality according to taste, memory or for many other reasons. Indeed, whatever the actual course of events, we cannot rely on works of art alone, but we can use them to get a better understanding of how they (the musician, the artist or the person who commissioned the painting) *wanted* something to be perceived. Not only are the visual arts important sources for understanding contemporary culture, politics and propaganda, but they are also sources for *seeing* sound. Richard Leppert has presented important research in this respect, where he argues that visual arts can be an important source for understanding music's social function and how it was used to convey meaning:

When people hear a musical performance, they see it as an embodied activity. While they hear, they also witness: how the performers look and gesture, how they regard the audience, how listeners heed the performers. Thus the musical event is perceived as a socialized activity [...] Visual art cannot replicate musical acoustics, but it can provide an invaluable hortatory account of what, how, and why a given society heard and hence in part what the sounds meant.<sup>35</sup>

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35 Leppert, R., *The Sight of Sound: Music, Representation, and the History of the Body* (USA: University of California Press, 1993), xxii.

We can therefore use visual works of art when trying to understand what constitutes a certain idea or concept. This will prove helpful when trying to understand a historically-distant musical activity from a sonic perspective. Because of the scarcity of written documentation (which again is subject to the reader's interpretation) and the completely non-existent corpora of recordings from the time, we must seek additional information elsewhere. Visual art can in such cases prove quite enlightening. Leppert further argues that what appears in a visual work of art is there for a reason, to convey meaning to the perceiver and to take part in social interaction at more complex levels:

The only purpose in preserving — making replicable — sounds is that they mean something; [...] It is no accident that the early history of notation coincides with the codification (regularization for ideological and political purposes) of the liturgy in the medieval Church. It is no accident that musical manuscripts were often elaborate, visually stunning productions or that much of the printed art music of the nineteenth century carried dedications to rich patrons. The issue of dedications goes beyond the mere economic gain hoped for by impoverished composers. It begs the question why the commission of manuscripts and dedications in printed music might matter to patrons. The value implied exceeds that of physically possessing notated music, which cannot, like a painting, be hung up and looked at. The value instead comes with the faith, sometimes *not* justified, that the experiential sonoric phenomena promised by the score have transliterated a particular world order into the properly aestheticized aural form.<sup>36</sup>

Following his argument, the actual sound of a performance and how sound is represented are closely linked. In such a context that I present in this book, where original sources are relatively scarce, it is therefore possible to turn to works of art to find meanings which can fill some of the gaps or even contextualise the written primary sources already presented. I will do this from two perspectives: firstly, focusing on how the physical hand position is represented, ranging from the Renaissance to

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36 Leppert, R., *Sight of Sound*, 11–12.

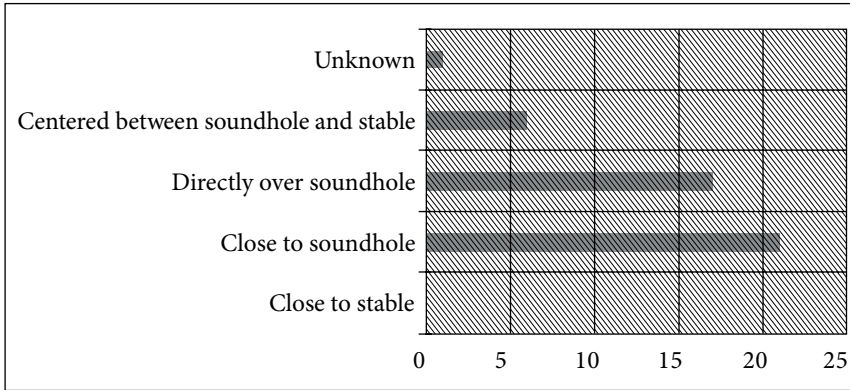
the Baroque; and secondly, looking at the depicted bodies' extroverted or introverted postures.

Jean-Marie Poirier has collected numerous historical paintings on a website illustrating the left and right-hand positions.<sup>37</sup> In an attempt to make my argument effective and clear, I have chosen to represent these paintings statistically rather than showing and discussing them individually. During my investigation, I focused on the right hand and placed all images in the following categories: 1) those with the right hand centred between the soundhole and the bridge; 2) those where the right hand is placed directly over the soundhole; 3) those where the right hand is in close proximity to the sound hole; and 4) those where the right hand is close to the bridge. I chose to keep Poirier's categorisation between 'La Renaissance, 1490–1650' (hereafter Renaissance), 'L'âge baroque (17e siècle)' (hereafter seventeenth century) and 'La fin du baroque (18e siècle)' (hereafter eighteenth century) to make it easier for the reader to visit his site and study the data. It should be noted that it can sometimes be difficult to decide which category a particular hand position belongs to. In such cases, I chose to use the plucking position of the fingers to decide. Sometimes the hands are widely stretched and at other times contracted, meaning that the fingers are not always well represented by the hand itself. Images where the hand is hidden or at a distance from the instrument have been labelled 'unknown.' The total foundation for this statistical overview includes 119 paintings; 45 being categorised as Renaissance, 44 as seventeenth century and 30 as eighteenth century.

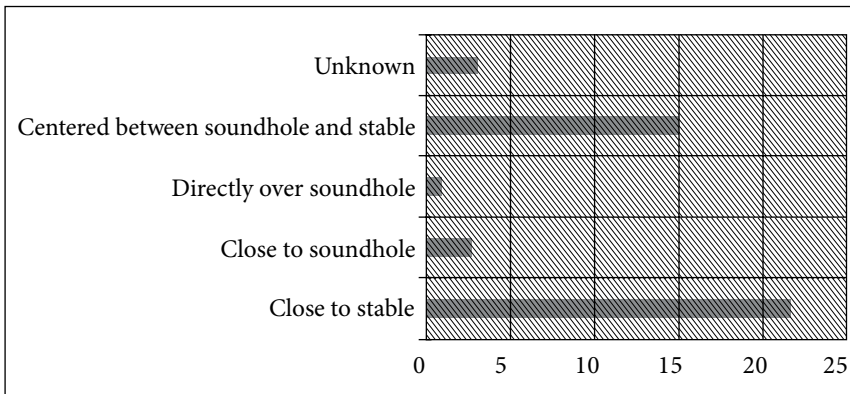
What the study revealed is that the visual aesthetics of tone production changed in art from the sixteenth century, where the right hand was depicted closer or directly over the soundhole (see Graph 2.1 below), to the seventeenth century, where close proximity to the bridge had gained favour (see Graph 2.2 below), and even more so in the eighteenth century (see Graph 2.3). This trend is furthermore interesting to see in conjunction with David Ledbetter, who argues that the lute lost favour to the harpsichord during the seventeenth century, and that the two instruments were

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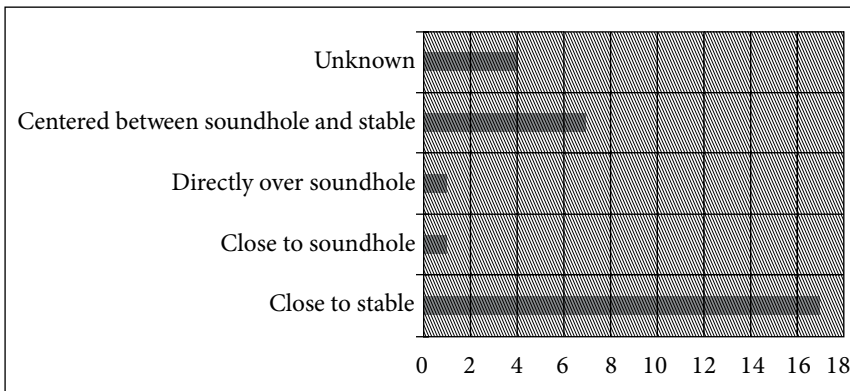
37 Poirier, J.-M., 'Le luth,' *le.luth.free.fr/*. Retrieved 6 September 2017, URL: <http://le.luth.free.fr/index.htm>.



**Graph 2.1.** The right-hand position between the bridge and soundhole in the Renaissance category.



**Graph 2.2.** The right-hand position between the bridge and soundhole in the seventeenth-century category.

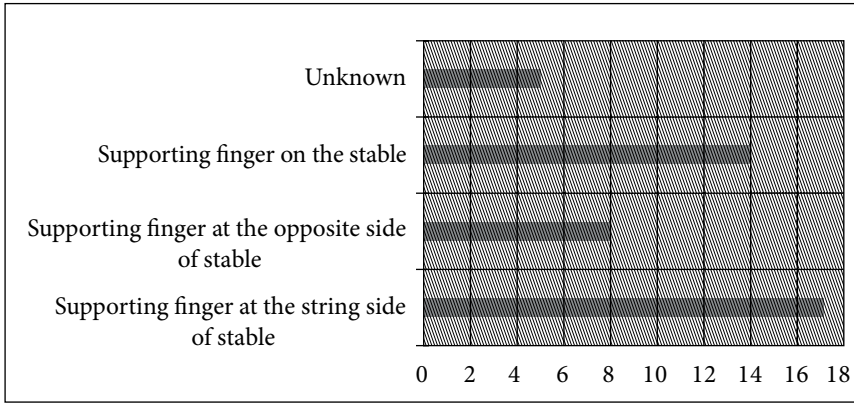


**Graph 2.3.** The right-hand position between the bridge and soundhole in the eighteenth-century category.

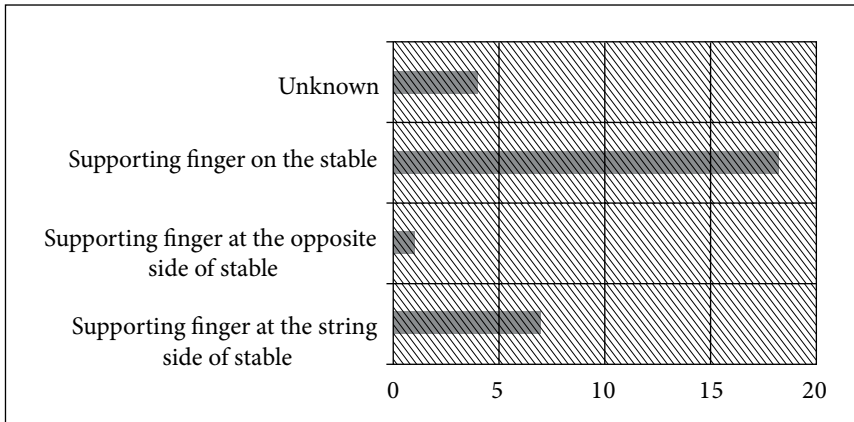
very closely linked in terms of their styles of ornamentation, composition and performance practice.<sup>38</sup> Reasons for the decline of the Baroque lute, for instance, may have had to do with the increased size of the orchestras, which made the theorbo, baroque guitar and harpsichord stronger sounding alternatives. But at the same time, it is interesting to note how the right-hand move from the soundhole to the bridge not only makes the tone more piercing and projecting, but also more similar in tone quality to that of the harpsichord. Furthermore, in the seventeenth-century category I found several examples of the supporting finger being placed on the bridge and several others placing the supporting finger behind the bridge, on the opposite side of the strings, which again supports the move towards the bridge as it gives an unmistakable physical point of contact with the lute (see Graph 2.4). This was even more evident in the eighteenth-century category (see Graph 2.5). In the Renaissance category I found no examples at all of the supporting finger being behind the bridge (see Graph 2.6). Visually, this gives us an idea of a tone production aesthetic moving from dull (or ‘warm’) to a tone rich in transients (or ‘metallic’). Furthermore, the angle at which the fingers pluck the strings is very much decided by the height of the wrist. This is because the arm has to have contact with the body of the instrument to keep it in place, and a wider angle between the lid of the instrument and the forearm forces the wrist to compensate for the fingers to reach the strings. If the angle is low (see Fig. 2.1 below), the thumb becomes more parallel to the strings it plucks and therefore has a larger contact area. On the other hand, if the angle is wider, the thumb meets the string vertically and has a smaller contact area (see Fig. 2.2 below). Recall that earlier in this chapter, a statistical study showed how the preference shifted from having the hand close to the sound hole in the Renaissance to close to the bridge in the later Baroque. This would also imply a shift of hand position and plucking angle from that of Figure 2.1 to Figure 2.2. In this respect, it is particularly interesting to note a brief passage in *The Burwell Lute Tutor* which, as stated earlier, promotes a hand position close to the bridge. What is notable in this passage is that the simultaneous plucking of three strings was not supposed to be

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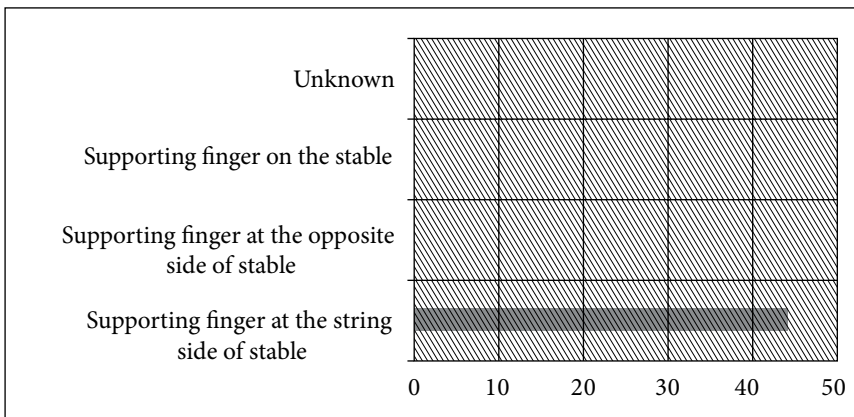
<sup>38</sup> Ledbetter, *Harpsichord and Lute*.



**Graph 2.4.** The placement of the supporting finger in the seventeenth-century category.



**Graph 2.5.** The placement of the supporting little finger in the eighteenth-century category.



**Graph 2.6.** The placement of the supporting little finger in the Renaissance category.



**Figure 2.1.** Low-angle wrist and a large contact area at the thumb. Photo: Robin Rolfhamre.



**Figure 2.2.** High-angle wrist and a small contact area at the thumb. Photo: Robin Rolfhamre.

plucked by three separate fingers as had been done in the Renaissance (using the interchanging thumb-index-finger technique, or *figuetas*, promoting the right hand to be placed close to the soundhole). Rather, they should be plucked with one sweeping finger alone to secure that all

strings were used. By comparing the *figuetas* technique to the Baroque technique close to the bridge, we soon notice how the first easily activates the two strings of each pair, while the latter indeed only hits the first of each pair. In this case we can see how the shift in tone production aesthetics from the dull to the hard also has consequences for the fingering and interpretation of lute music; we see how a certain ideology of tone production directly alters a performance practice and the manner in which the lutenist relates to a musical work:

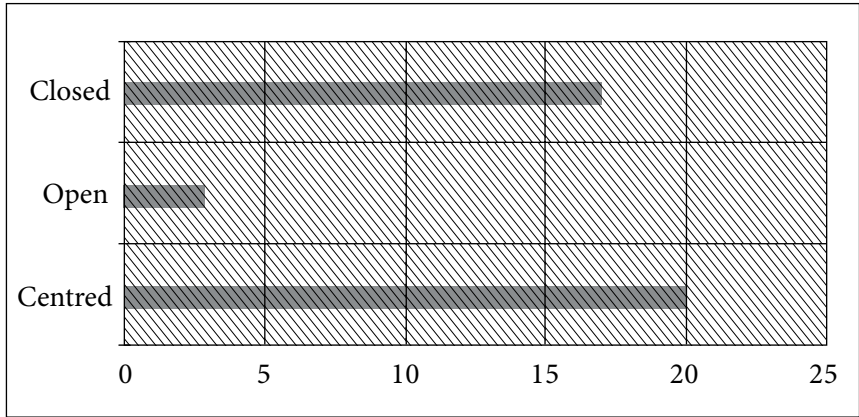
[...] if there be three small strings together you must not strike them as people did formerly with three several fingers, but with the forefinger only, sliding from the treble upwards over the strings and repeating sometimes the treble with the middle finger. The reason why we do not play with three several fingers is that striking thus we miss half of the strings; that is, of every couple of strings we can strike but one.<sup>39</sup>

In line with Leppert's argument that we can 'see' sound in a visual work of art, it is also interesting to read introversion and extroversion alongside the hand positions discussed above. In this phase of my analysis I revisited the same paintings and categorised them according to the performers' body postures. I labelled them according to bodies playing in a balanced, centred position (where I perceived bodily control, balance and order); bodies in an extroverted, open position (neck bent backwards, looking away, displaying the chest, etc.); and finally, bodies in a closed position (bending forward, looking down, reading some sort of musical notation). The results were intriguing, as they supported the move from the dull and less projecting tone quality (at least over greater distance) of the Renaissance to the more metallic, piercing tone quality of the later Baroque. This is evident because the Renaissance category was overrepresented by centred and closed bodies (see Graph 2.7 below); the seventeenth century favoured open body postures (see Graph 2.8 below); while the eighteenth-century category displayed an overrepresentation of centred bodies (see Graph 2.9 below). In Table 2.1 below, I show how these results align and what becomes apparent, especially when trying out the

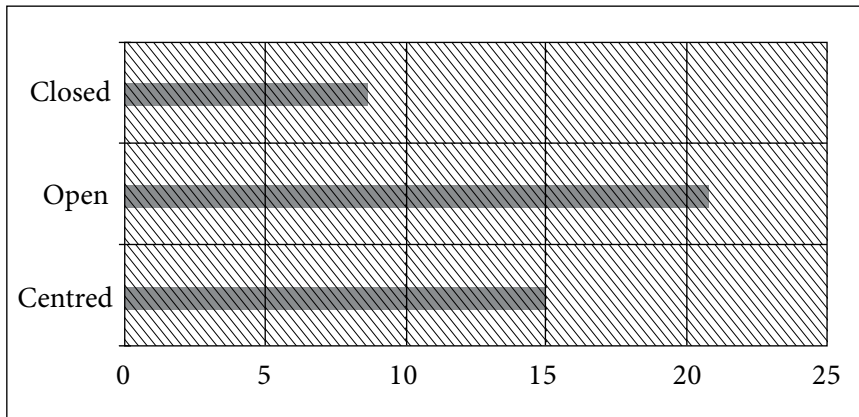
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39 Dart, *Burwell*, 29.

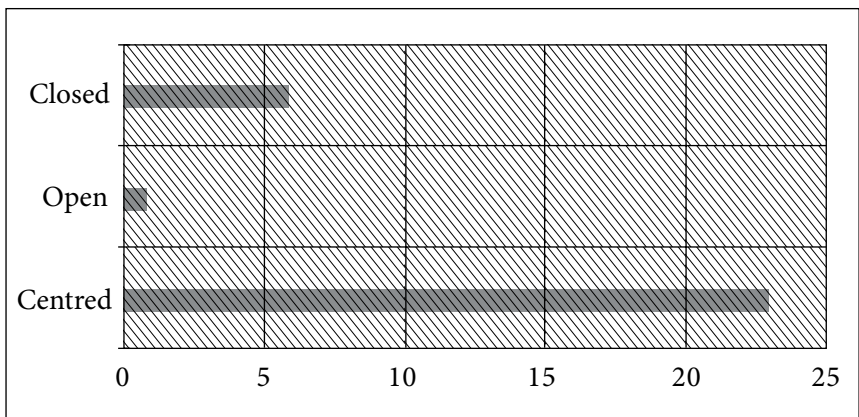




**Graph 2.7.** Body postures in the Renaissance category.



**Graph 2.8.** Body postures in the seventeenth-century category.



**Graph 2.9.** Body postures in the eighteenth-century category.

**Table 2.1.** Suggested reading from comparing the trends revealed by the data.

Category	Favoured hand position	Favoured body posture	Suggested reading
Renaissance	Close to or directly above soundhole	Centred/closed	Duller, less percussive, soft and quiet.
Seventeenth century	Centred/close to the bridge	Open/centred	More open, extroverted tone quality, more apparent overtone activity. Clearer attack. Louder.
Eighteenth century	Close to the bridge	Centred	Very percussive, much more overtone activity, woody sound. Loud and piercing.

various solutions on an actual instrument, is that the visual concept of tone production seems to have moved from a duller, warmer and softer tone quality in the Renaissance to a percussive, metallic and at the same time woody, more piecing tone in the eighteenth century, with much more overtone activity.

## Fingering

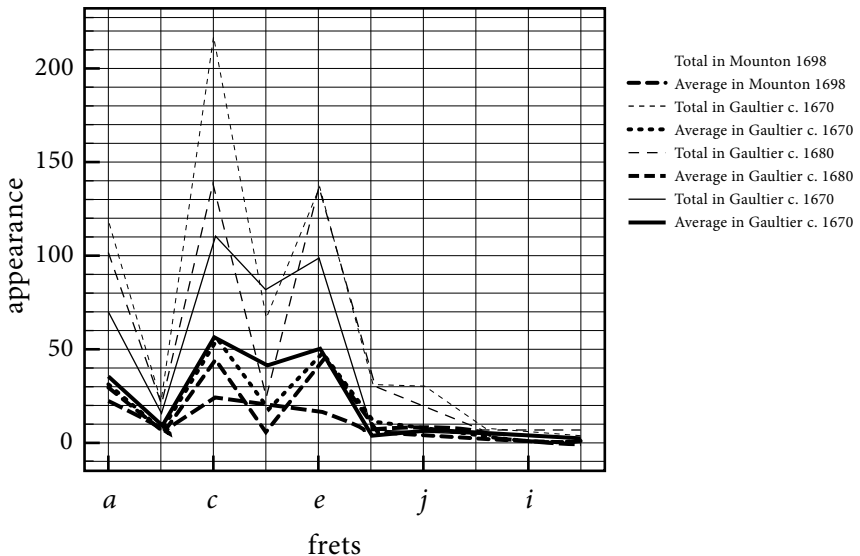
What is covered most regarding the right hand in historical lute sources are fingerings. To various degrees, according to nationality, time period and the intended instrument, we can learn much of performance practice simply by studying fingerings. The subject is vast, and a full-scale inquiry of the matter is not necessary in this present context, but I will, however, draw attention to some specific examples which unveil important perspectives for my development of a conceptual understanding of tone production on lute instruments. The points I wish to make relate to seven key perspectives:

1. The preference for open strings and the first position.
2. The weight distribution of the weak *figuetas* technique.
3. The *figuetas* reminiscence of the French Baroque lute repertoire.
4. The transition from the Renaissance to the Baroque plucked chord.
5. The right-hand strumming mosaic of Francesco Corbetta (1671, 1674).

6. The offbeat slurs of the Baroque repertoire.
7. Silence.

## The preference for open strings and the first position

Mace made an interesting observation when he wrote: '[...] because an *Open String* is more *sweet*, and *Freer of Sound*, than a *stopt String*.<sup>40</sup> Indeed, the part of the corpora emphasising open strings is almost exclusive. Again, we can look at this statistically. Consider the free seventeenth-century preludes presented in the lute tablatures of the Gaultiers (c.1670 and c.1680), Mouton (1698) and Gallot (c. 1670)<sup>41</sup> where we see a clear preference for the first four frets and the open strings (see Graph 2.10 below).



**Graph 2.10.** Statistics over the total and average number of tones found, and what fret they are played on, in all the preludes by the Gaultiers (c.1670 and c.1680), Mouton (1698) and Gallot (c. 1670).

40 Mace, *Monument*, 68.

41 Gaultier, D., and Gaultier, E., *Pièces de luth, sur trois différent modes nouveaux*, réimpression de l'édition de Paris, c. 1670; and *Livres de tablature des pièces de luth, sur plusieurs différent modes, avec quelques règles qu'il faut observer pour le bien toucher*, réimpression de l'édition de Paris, c. 1680 (Genève, Minkoff Reprint, 1975); Mouton, C., *Pièces de luth sur différent modes; Premier et second livre*, c. 1698, Réimpression de l'édition de Paris, l'auteur, introduction de François Lesure (Genève, Minkoff Reprint, Genève 1978); Gallot, le V., *Stücke für Barocklaute*, c. 1700, Reproduktion der Handschrift im Besitz der Stadt Leipzig Städtische Bibliotheken Musikbibliothek (Signatur II.6.14), Albert Reyer (Germany, Tree edition, 1999).

## The weight distribution of the *figuetas* technique

The Renaissance practice of plucking the strings, that is the *figuetas* technique, was based on an alternation between the thumb and index finger (sometimes the middle finger substituted for the thumb when it was otherwise occupied). This is axiomatic and thoroughly supported by both written descriptions and the fingerings of almost every tablature from that period of time. But what is interesting is to note several physical premises of the technique which have great significance for tone production. First of all, it is a weak technique which naturally helps the performer not to overpower the lightly-built instrument. Secondly, it allows the hand to enter an oscillating mode in which the hand easily rotates up and down in a relaxed manner. In addition to the lack of force and its consequent relaxation, this oscillating mechanism makes it much simpler to accommodate the share speed of melodic progression asked for in many Renaissance tablatures. Compare this to Corbetta's instruction to strum chords with the hand and the wrist together cited above, and we see how this mechanical function could perhaps be an integral part of lute technique in general, not only a feature of the *figuetas*. Thirdly, the natural difference between the weight of the thumb and the index finger produces an effortless distinction between strong and weak beats. This is something modern guitarists, for instance, struggle with in their use of all fingers in complex patterns as they must counteract the natural differences of weight and length between the fingers to produce strong and weak tones regardless of which finger plays it. Fourthly, the important difference in angle between the thumb and the index finger when approaching the course. As a result of the *figuetas* technique and the visual representations analysed above, the thumb will naturally produce a resting stroke and thus it incorporates both strings of each course. The index finger, on the contrary, reaches the course from below with much less force and, due to the open-hand position, it emphasises the lower string of the pair and does not force both strings to be played. What is very interesting with this latter perspective is that it possibly allows the upper string to keep ringing even if the lower is plucked or brushed, depending on who is playing, resulting in a very nice legato-like melodic

line.<sup>42</sup> (This is an ideal that I find very useful in my own practice, but we will see in Chapter 3 that this is not a widely-recognised perspective in today's literature.) This is perhaps also what makes the *figuetas* technique most suitable for double strings, rather than single, and why modern guitarists often struggle to make it sound good with nails, as the nails are now being thought of as part of a two-fold relation between nail and flesh in many present-day traditions of Classical guitar technique. It is difficult to adequately make contact with both nail and flesh from the direction which the index finger approaches the two strings of each pair.

## The pronounced *figuetas* reminiscence of the French Baroque lute repertoire

It is also noticeable that the thumb keeps playing an important part as the foundation for tone production even after the Renaissance *figuetas* technique had lost its suitability, due to more complex compositional demands of the right hand. The clearest example is perhaps provided by the French, who seemed to take this idea further than their international colleagues (compare Example 2.1). In the example below, as is the case in general, a short line represents the thumb while one dot suggests the index finger and two dots equals the middle finger. Notice how the thumb is used all over the full register of the instruments in Example 2.1. Recall also *The Burwell Lute Tutor* cited above, in which the issue of striking both the strings of each pair had become difficult as the right hand was placed closer to the bridge ('[...] The reason why we do not play with three several fingers is that striking thus we miss half of the strings; that is, of every couple of strings we can strike but one<sup>43</sup>). This is perhaps another good reason why the *figuetas* mentality lives on in the fingering of French seventeenth-century music, both to have the thumb activate the full courses, producing a richer sound through its resting strokes, and

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42 I thank Rolf Lislevand for drawing my attention to this phenomenon during private conversations.

43 Dart, *Burwell*, 29.



**Example 2.1.** Extract from 'La belle homicide, courante de M.' Gautier' and 'Double de la belle homicide,' *Pièces de luth sur differents modes...* (c. 1698), 15-16. In my own transcription.

to gain from the natural weight distribution discussed above: 'Sometimes you make a whole passage with the thumb and the finger' (*The Burwell Lute Tutor*).<sup>44</sup>

## The transition from the Renaissance to the Baroque plucked chord

If we compare the traditional Renaissance fingering, where each tone of a chord is plucked by a separate finger (see, for instance, Visconti's description above), to the sweeping motion of one finger to produce the same chord described in *The Burwell Lute Tutor* above (this is supported by the fingering of multiple tablatures, but for the ease of the argument I will call it 'the Burwell Solution'), we notice two important perspectives. Firstly, the Renaissance fingering is produced *tirando* (i.e. the finger plucks the intended string without touching any other string) while the Burwell Solution produces an *appoyando* (i.e. a resting stroke, where the finger falls on the string below after plucking the intended string). The practical consequence of this is that the Renaissance solution is more even when the *tirando* is constant, regardless of the context, be it a chord or a single note, while the Burwell Solution's *appoyando* differentiates itself from the normally-plucked strings, especially considering the close proximity to the bridge. In this latter case, the performer must decide if this difference is something to be embraced or counteracted in each separate context. Secondly, the Renaissance approach gives the performer the advantage of being able to choose whether the chord is to be played broken or synchronized, while the Burwell Solution can only be performed broken.

<sup>44</sup> Dart, *Burwell*, 32.

## The right-hand strumming mosaic of Francesco Corbetta (1671, 1674)

Francesco Corbetta presents another case where fingering provides useful information as to what can be constituted as a concept of tone production. He presents an elaborate right-hand mosaic of a strumming pattern, in which three fingers of the right hand are used according to their natural difference in weight and length to colour each strummed chord individually:

Vedrai lesemplio dun repicco posto in una Ciaconna, doue la nota piu longa significa il polzo, cominciando prima i diti poi con il polzo facendo listesso all in su e osserua che le quatro note legate significano douersi far prima con il secondo dito e poi con il primo appresso, e cosi all in su sotto a un tempo piu presto, e poi seguita con i diti et il polzo [...] Vous uerrez l'exemple d'une batterie, mise sur un caprice de chacone où la note la plus longue signifie le pouce tant au dessous qu'au dessus et remarquez que quand uous uerrez quatre notes liees ensemble, uous deuez uous seruir auparauant du second doigt en descendant, et puis apres du premier doigt uous ferez de mesme en montant dans un tēps plus prompt et continuez tousiours avec les doigts et le pouce suiuant l'exemple que uous y uerrez.<sup>45</sup>

(You will see the example of a *repicco* (i.e. strumming) in a *Ciaconna*, where the longer note [stem] signifies the thumb, starting first [with] the fingers, then with the thumb [and] doing the same [with] all [indicated fingers in an] up-[wards motion], and observe that the four related notes [marked with a slur] signify to having to be [played] first with the second finger and then with the first close by, and then all [indicated fingers] upwards in a quicker tempo, and then followed with the fingers and the thumb [...] You will see the example of a battery [i.e. strumming section], set to a *caprice de chacone* where the longest note [stem] signifies the thumb, both from below and above, and note that when you see four notes tied together, you first have to serve [i.e. strum] the second finger downward, and then, after the first finger, you will do the same by going up in a faster time, and continue with the fingers and the thumb according to the example that you will see.)

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45 Corbetta, *Royalle 1671*, 3 and 7.

This is further supported by Corbetta's 1674 version of *La guitarre royalle*: 'Quand à la Batterie la plus longue notte marque le Poulce. / Et couchant le premier doigt sur la touche, Vous touschere les Points marques un a chaque corde.'<sup>46</sup> (When at the battery [i.e. strumming section of the musical work], the longest note marks the thumb. / And setting the first finger on the fret, you strike each string [of the chord] with the fingers marked). In Table 2.2 below we see how the Italian and French instructions from 1671 and 1674 add up to this complex right-hand mosaic, which is 'plus delicate'<sup>47</sup> (very delicate). Corbetta must be seen as a special case, as this level of notating a strumming pattern is unparalleled in the Baroque guitar repertoire, even among his own works. But what we can learn from this is that tone production and the design of performed sound mattered to the Early Modern performer beyond the 'simple' production of a generally good tone. In the case of the 'Caprice de chaconne,' we see tone production as something similar to sculpting, which not only bears witness to Corbetta's abilities as a performer, but also shows that there are more subtle levels of tone production in the Early Modern era than what we perceive from the literature alone. It is further noticeable — considering Capirola's remark above to let all the tones of the left-hand ring for as long as possible — that if doing so when performing the 'Caprice de chaconne,' one can create an illusion of a much larger instrument. In fact, not only does the instrument sound larger, but Capirola's idea also emphasises the psychoacoustic effect of a bass line on an instrument severely lacking real basses. In my experience as a performer, this is true for many of the musical works of the Baroque guitar repertoire.

**Table 2.2.** The right-hand mosaic of Corbetta's 'Caprice de Chaconne.' (1671); (legend: 16 = semiquaver and 32 = demi-semiquaver; m = middle finger, i = index finger; p = thumb; d = down and u = up).

Rhythmic value:	16	16	16	16	32	32	32	32	16	16	16	16	16	
Finger:	m	p	p	i	m	i	m	i	i	i	m	p	p	i
Finger direction:	d	d	u	u	d	d	u	u	d	u	d	d	u	u

46 Corbetta, F. *La guitarre royalle* (Paris, Bonneüil, 1674), 4.

47 Corbetta, *Royalle 1671*, 7.





*Speakable.* Lastly, although not considered a grace itself, the pause ‘adds much *Grace*.’<sup>49</sup>

What we have seen throughout this chapter is that we can find important traces of what the historical concept of tone production might have entailed. By comparing various kinds of sources, we can draw lines between indicators hidden from plain sight and, thus, construct an idea of performance technique from a tone production perspective, focusing particularly on the right hand. In its diffuse dissemination over various sources, we see that the idea of a tone production concept for lute instruments was quite detailed and well designed, but it received little explicit attention in contemporary lute instructions. Furthermore, the closer we are to the inevitable decline of the lute, the more detailed the literature becomes, as the authors suddenly see a need for documenting and disseminating the practice. It is therefore difficult to gain a balanced, full understanding of the matter across the ages, but together with visual sources and tablatures, we can indeed get enough information to form a general idea of the matter. What is interesting to note after unveiling these practices is how they sometimes differ from today’s practices among lutenists. In the following chapter, I will look at tone production as it can be understood from today’s practices.

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49 Mace, *Monument*, 109.



## CHAPTER 3

# Present discourse

So far, what we begin to see here is an excellent example of the balance between learning to play from a tutor and from literature. The more important the tutor is for learning the instrument, the less important the literature becomes. Warner Iversen and Michael M. Grant (2016) write, ‘You cannot really learn to play the lute using a book “tutor.” These tutors can be good references, can offer some good material, and may even help a bit with technique but no one can learn from a book tutor alone. To learn the lute you need a teacher.’<sup>1</sup> We also see how collegial consensus impacts on the literature being produced. In the Early Modern period, lute playing was a part of everyday life for many (not necessarily playing themselves, but being acquainted with it); it was culturally integrated as one of the most popular instruments. Today, however, it is not; today it belongs to the dedicated souls who wish to understand the lost tradition better and bring it back to life again. Here we can clearly differentiate between those who play it as if it were a modern Classical guitar and those who play it solely ‘as a lute’ (according to our present understanding of the historical sources). And, as our understanding and interpretations differ among colleagues, we struggle to reach general consensus (not necessarily the general playing positions, but rather the smaller details). In addition to the remarks made in the previous chapter, where we saw an increase in sources describing the details of lute tone production the closer we got to the lute’s decline, this is probably why we are seeing a greater quantity of lute instructions today. With the lack of a clear consensus, we need more

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<sup>1</sup> Iversen, W., and Grant, M.M., *A Beginner’s Guide to the Renaissance Lute: A Helpful Source of Information About your Rental Lute to Answer Your Questions and Get You Started until You Meet with Your Teacher* (n/a.: Lute Society of America, 2016) Online PDF, 10. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/resources/Documents/Beginners%20Guide%20Final.pdf>.

contributions to the general lute-performance discourse. Indeed, we are not describing a present practice alone, as would be the case in the Early Modern times, but we are reconstructing and reconfiguring something distant to us — we are taking pieces of a puzzle of past practice and trying to make modern sense of it (I develop this further in Chapter 5).

In the modern literature, we find various approaches to the subject, ranging from perspectives that start with the Classical guitar point of view, through to anti-guitar perspectives which distance themselves from the instrument entirely; and historically-informed (implicitly or explicitly) to non-historically informed perspectives (i.e. ‘take my word for it’ sort of literature). Although the lute is a centuries old instrument, it is a fairly new phenomenon and practice. The ‘modern’ lute is only about 100 hundred years old. Unlike instruments such as the violin and the flute, where some major schools have been around for ages, the lute is still part of an inventive process in the making. How we understand lute tone production today is based on this modern phenomenon and the present understanding of the historical past. What is interesting to note, as we will see, is that tone production and timbre seem to be somewhat taken for granted among many modern sources. It seems often to be the case that by following the simple steps described, one automatically produces a good tone. This is not the case, however, because a good finger motion by a properly-positioned right and left hand on a properly-strung and maintained instrument can still produce unpleasant noise, for instance, from using too much muscular power. As a result, we cannot write about sound satisfactorily. We can only resort to the use of adjectives and adverbs which are culturally and historically situated. To understand the words properly we also need to understand their context. In this respect, I will not concern myself with the morphological cultural-linguistic development of the terminological practice, but rather look at instructions on how to utilise the hands, the right hand in particular, to produce tone.

One problem with lute performance literature, in general, is the lacking Open Access tradition. Availability is restricted and performers’ access to information is much determined by their personal or institutional economy. This particularly relates to articles being scattered around various publication channels, often only accessible through subscriptions. The

cause of this is, of course, financial since most lute societies are funded through their subscribers in order to maintain any sort of publication to distribute. Although many publishers make literature freely available after a certain quarantine period, often ranging from one to three years, there are still issues related to the material risking being partly, or sometimes even fully, outdated. The discourse is then often addressed collectively in a 'public' debate through mailing-lists, but those discourses are almost completely driven and developed by a few dedicated respondents leaving the opinions and thoughts of those silent outside the debate. Some, like myself, prefer to participate inactively in such forums to get updates on the current and past discourses, without necessarily contributing through written responses. Hence, availability of information is a clear issue for those taking up the lute through literature.

In this chapter, I will differentiate between instructions addressing the thumb inside technique, here called the *Renaissance lute approach* for the ease of argument, and the thumb outside technique, or put simply, the *Baroque lute approach*. A clear difference between the two techniques is not that simple because they do not exist in a clear dichotomy, but rather in a morphological relationship. Most of the sources use this distinction themselves, however, and it will therefore serve the argument presented here well enough to separate the two concepts. I address each category of sources chronologically to unveil the development of how lute sound related to the right hand is presented and how the debate unfolds. I will start with articles and then proceed to instruction books, before ending with online sources.

## Instruction articles

There seems to be a clear difference between various sorts of lute journal publications. Peer-reviewed yearbooks seem to be more occupied with history, manuscripts, musical notation, etc. while quarterlies and newsletters more often cover practical topics such as performance technique, often without a proper, academic peer-review process. In this literary environment, there is therefore a practice of separating theory from performance, where articles situated between those two perspectives can

find themselves ‘falling between two stools,’ so to speak. Publishers aside, there are examples of websites that collect various publications for the benefit of the performer and scholar, or at least point the reader in the right direction. One good example is The Lute Society of America, which provides a list of reading materials for beginners,<sup>2</sup> in which eight entries specifically treat the right hand.

As in many instances where forgotten practices are yet to be rediscovered, it is those practices that are the most different and mystical to us that receive the most attention. It is therefore no wonder that the Renaissance *figuetas* approach is the most well-covered topic in modern literature, both in articles and books. Along with the upswing in modern lute practice in the 1970s and 80s, several articles were published treating the Renaissance lute and thumb inside approach. For instance, Catherine Liddell and Robert Strizich (1976) write about what they call the thumb under technique which, according to their account, was quite new in the 70s: ‘[...] many players here in Europe have been experimenting with the “thumb-under” position for the right hand. The current interest in this hand position has been inspired by the playing and teaching of the German lutenist Michael Schäffer [...].<sup>3</sup> They draw attention to several interesting perspectives. Firstly, that the hand should be placed between the bridge and the rosette with the little finger resting on the belly. Secondly, that the thumb should pluck under the fingers: ‘in other words, everything your classical guitar teacher told you *not* [underlined in the original] to do!’ Thirdly, they give directions regarding the thumb technique, where ‘the thumb strikes more or less directly downwards, perpendicular [i.e. at a 90 degree angle] to the strings, while the index finger strikes neither [*sic*] straight up (i.e. along the strings), but in a direction between these two extremes.’ What is notable here is the attempt at detailed instructions, which at the same time are somewhat diffuse. It seems as if the thumb should move alongside the soundboard rather than

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2 The Lute Society of America. ‘LSA Articles for Beginners,’ *lutesocietyofamerica.org*. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/Beginner-Articles>.

3 Liddell, C., and Strizich, R., ‘Technique,’ *LSA Quarterly*, no. 2 (1976): 3–4, 3. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/resources/Documents/Pedagogical%20Articles/Thumb-Under%20Position,%20Lidell%20and%20Strizich%20LSAQ%201976%20No.%202.pdf>.

into it (cf. ‘perpendicular’ and ‘directly downwards’), but the addition of ‘more or less’ makes the instructions less clear. Fourthly, that the index finger should be relaxed and therefore springy, touching both strings of a course with the flesh: ‘[t]he index finger should be relaxed, especially at the tip, and one should strike both the strings of each course, trying to play with as much fleshy area as possible. It is the use of a relatively large area of flesh on the tip of the finger that gives this characteristic ‘round’ tone [...].<sup>4</sup> It is notable that the key to the ‘characteristic “round” tone’ lies in the flesh of the fingers, and taking the perpendicular, more or less directly downward motion of the thumb, into consideration, we see how the sound in practise can produce difficulties. This is something they point to themselves:

The first advantage to be noticed is a definite improvement in tone, for it is now easier to play both strings in a course and to use a larger area of flesh on the fingertip, all of which produce a fuller, rounder, and more ‘fleshy’ sound. [...] On the other hand, a possible disadvantage of the thumb-under technique is that the tone can lack a certain sharpness, depending on the size and shape of the fingers. This is especially true if one is accustomed to the type of tone produced with fingernails; indeed, those who play with nails will probably find this technique unfeasible.<sup>5</sup>

Later, Paul Beier (1979) presents a more in-depth article on right-hand technique in the Renaissance style of playing, but he is mostly focused on the right-hand position. The finger mechanics are given little attention. We do, however, find some primary-source-based clues relating to tone production in his writing, in which the transition from thumb inside to outside is addressed in relation to lute construction and building materials. In his examples, a soft, fleshy technique tames the earlier bright instruments, and a bright, close-to-the-bridge technique compensates for later, duller instruments:

With thumb-under, the fingers were placed quite near the rose and both fingers and thumb had a great deal of contact with the strings; they struck the strings

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4 Liddell and Strizich, *Technique*, 4.

5 Liddell and Strizich, *Technique*, 5.



using a relatively large surface area of flesh and string. The effect of this is to produce a rather warm and luscious tone. With thumb-over, the opposite is true. The fingers strike the strings at a sharper angle with little surface area.

The changing styles in lute construction also has a considerable effect on tone. The small, high-pitched, narrow-bodied lutes of the early period were generally made with very hard woods for the ribs and have an inherently bright and piercing tone. The warm sound of the thumb-under is ideally suited to compensate for this [... and vice versa].<sup>6</sup>

This point is further exemplified by Robert Barto who, in his article ‘Some 18th Century German Sources for Right Hand Placement and Fingering’ (2007), draws attention to the writings of Ernst Gottlieb Baron:<sup>7</sup>

Baron states very clearly where one should place the right hand and why. He says, ‘As to the question of where to strike strings of the lute so that the tone will be powerful enough, it will serve to know that this must be in the center of the space between the rose and the bridge, for there the contact will have the greatest effect. The further toward the fingerboard the strings are struck with the right hand, the softer and weaker will be the tone — it will lose power, so to speak. However the player can certainly also move back and forth, once he has the necessary skill, when he wishes to change [the tone] and express something. (cited by Barto, in Douglas Alton Smith’s translation).<sup>8</sup>

In the year following publication of Beier’s article, Pat O’Brien (1980) provides a new perspective on the subject which is more detailed. Here, he emphasises the contact point between the finger and the course, and also introduces a more ergonomic approach. By introducing the use of the weight of the arm, he presents an approach that looks outside the domain of the fingers alone and includes the upper torso in tone production. He

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6 Beier, P., ‘Right Hand Position in Renaissance Lute Technique.’ *Journal of the Lute Society of America* (1979): 5–24. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/resources/Documents/Pedagogical%20Articles/Right%20Hand%20Position%20in%20Renaissance%20Lute%20Technique,%20Beier%20JLSA%201979.pdf>.

7 Barto, R., ‘Some 18th Century German Sources for Right Hand Placement and Fingering’ *LSA Quarterly, February* (2007): 4–10. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/resources/Documents/Pedagogical%20Articles/Right%20Hand%20Fingerings%20from%20Baroque%20Sources,%20Barto%20LSAQ%202007%20.pdf>.

8 Barto, *German Sources*, 5.

further adds that there is a relation between the weight applied and the volume of the tone:

3) Flex index finger as deeply as possible, (toward elbow!) [...] 5) arrange to contact the second [c]ourse, [*sic*] at this lowest point of the finger's arc. [...] 7) At contact with the string, the oval of the fingertip as it is viewed endwise, is bisected diagonally by the strings. / 8) Relax right shoulder and arm so that their weight depresses the course toward the top, without the two strings contacting each other. / 9) Pluck the finger off the course with the deep flexion of the index finger described above. / 10) The amount of depression of the string toward the top just before plucking, determines the volume. [...] 11) At no time can the tip joint of the finger be flexed without, a) bringing the nail dangerously close to the string, b) a tightening of the adjacent finger, c) a loss of tone.<sup>9</sup>

In the last lines, we also see how the nail is addressed once more. This is a clear message that the lute calls for a different approach than the guitar, as the nail should be kept away from the string. Furthermore, one should avoid bringing the nail *dangerously* close. The use of a negative adverb clearly labels the nails not only as a mischief, but also as something to distance oneself from; something that is clearly not good.

This new perspective of introducing mechanical details when describing and constructing a right-hand technique is also present in Ronn McFarlane's 'Right Arm Movement and Follow Through in Thumb-Under Technique' (2008). He draws further attention to weight distribution, particularly the balance between the arm and the fingers. Rather than O'Brien's use of the single word 'volume', McFarlane uses three: 'weight', 'volume' and 'strength'. This focuses more attention on various facets of tone production which, in my interpretation, translate into perceived presence and 'body',<sup>10</sup> tone 'size' (i.e. activation of overtones and

9 O'Brien, P., 'Basic Finger Motions/Basic Right-Hand Exercise for Tone,' dated August 1980. *LSA Quarterly*, Winter (2014): 24–25, 24. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/resources/Documents/Pedagogical%20Articles/Basic%20Finger%20Motions,%20O'Brien%20LSAQ%201980.pdf>.

10 In my experience, this is a term sometimes used by musicians (myself included) to describe a tone that activates its full harmonic register (according to the context) and that can be heard over distance in a concert hall. A tone with insufficient 'body' will appear weak and is only heard by the first few rows of the audience.

experienced fullness) and amplitude (see Chapter 4). It is also noticeable that his approach is more nuanced. Rather than presenting a single *modus operandi*, i.e. ‘produce this tone,’ he directs attention to the possibilities of using weight distribution to change the tone production over time:

The amount of arm vs. finger movement affects the weight, volume and strength of your tone. More arm movement tends to create a louder, deeper and more supported quality of sound. Less arm movement (or use of the fingers alone) creates a lighter, quieter sound. Subtle gradations of the amount of arm vs. fingers can be used to great effect. It is possible to shade the sound of a scale or a long line of divisions by gradually adding and subtracting the amount of arm movement. This is much more effective than trying to strike the string harder or softer to create a dynamic shape. [...] One can also shade the sound of a line by controlling the depth of follow through, which works much the same as right arm movement. A shallow follow through creates a lighter, more shallow tone and less sustain - especially when there is very little string excursion towards the soundboard. A deeper follow through usually creates a deeper, or more supported tone and greater sustain, [*sic*] This deeper follow through is more effective when paired with a greater string excursion toward the soundboard.<sup>11</sup>

McFarlane’s approach includes more descriptive language (louder, deeper, supported, quality, lighter, quieter, etc.), which is a natural development in the act of constructing a musical practice in writing. First, we acknowledge the act that has to be performed (Liddell and Strizich); then, we describe the mechanical details of that act to accommodate for the vagueness of simply saying ‘do this’ (O’Brien); and finally, we use descriptive language to nuance the mechanical process and to direct the reader to what is to be achieved (McFarlane). Parallel to this, we also take historical sources into account (Beier).

The final example is provided by Warner Iversen and Michael M. Grant in their free-to-download PDF document: *A Beginner’s Guide to*

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<sup>11</sup> McFarlane, R., ‘Right Arm Movement and Follow Through in Thumb-Under Technique’ *LSA Quarterly*, November (2008): 56. Retrieved 1 August 2017, URL: <http://lutesocietyofamerica.org/resources/Documents/Pedagogical%20Articles/Beyond%20The%20Basics/Beyond%20The%20Basics%20-%20Right%20Arm%20Movement%20and%20Follow%20Through%20in%20Thumb-Under%20Technique,%20McFarlane%20LSAQ%202008%20No.%204.pdf>.

*the Renaissance Lute: A Helpful Source of Information About Your Rental Lute to Answer Your Questions and get You Started Until You Meet with Your Teacher* (2016):

The two basic types of strokes used to set the strings in motion require the arm to move up and down from the elbow. With the pinky [*sic*] finger resting on the face of the lute, the downstroke is initiated from the elbow with the arm moving downwards and the thumb pushing through the string. Conversely, the upstroke is initiated as the arm rebounds back upwards and the index finger is pushed through the string.<sup>12</sup>

What we begin to unveil here is a level of detail and instruction that we never saw in Early Modern times (see Chapter 2). In reality, this level of detail must come from somewhere, and that is not necessarily from the past. The currently-developing canon of lute technique is therefore a modern phenomenon, a modern construct, based on modern values and practices. This is perhaps why it is significant that, for instance, the Renaissance instructions seen so far in this chapter (more examples to come), use descriptive language often utilised in guitar playing stemming from a Romantic tradition (e.g. much flesh, fullness, volume, strength, weight). This is language we do not see at the same frequency in historical sources. This creates a paradox where later language is used to describe earlier practice, and this is also the way it has to be. For language and communication to be successful, the writer and reader must have a common understanding of the language involved. What happens then is that modern lute practice, through its need to explain the unknown, creates itself as something other than historical practice. The modern sense of lute playing is not an embodiment of Early Modern playing; it is not meant to resuscitate the lute, but to reinvent it in more or less close dialogue with the past (at least our understanding of it). The thumb-inside, Renaissance practice serves as a good example, as it (at least in regard to the right hand) is so very different from modern guitar practice, and thus produces more clear material for discussion. When turning to the

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12 Iversen and Grant, *Renaissance Lute*.

Baroque, thumb-outside approach, more is taken for granted and we also find fewer publications.

## Instruction books

Instruction books are more frequent than articles. This has to do with the often, very close relationship between technical instruction and examples, etudes (practice pieces) and exemplification. Here we also see the friction between the lute and the modern guitar more clearly. Examples will be given chronologically and, for copyright reasons, I have excluded photographs and focused on the written word. Where a photograph has played a significant role, I have described it in brackets.

## Renaissance Lute

One of the earlier examples of instruction books treating the thumb-in-side technique is the *Method for the Renaissance Lute* by Stanley Buetens (1969). It seems promising, as it boldly states on the cover: '[...] toward the development of a lute technique based on historical principles And [sic] including pieces from the lute literature, photographs, drawings, and information on many aspects of lute playing.'<sup>13</sup> But the book presents no such evidence from the original sources to the reader (only in paraphrasing according to Buetens understanding of it) and some of the historical 'facts' presented we now know to be inaccurate. (This is, of course, understandable given the early publication year and the natural course of knowledge development.) The right-hand technique that is presented here through photographs displays a somewhat exaggerated version of the more recent Classical guitar, right-hand technique that is similar to performers such as John Mills<sup>14</sup> and Andrés Segovia.<sup>15</sup> This is the early

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13 Buetens, S., *Method for the Renaissance Lute*, fifth printing 1983 (n/a: Instrumenta Antiqua, 1969).

14 See for instance 'John Mills Discusses Tone Colour on the Classical Guitar,' YouTube video, 1'28", posted by 'DPJFILMS,' retrieved 9 August 2017, URL: <https://www.youtube.com/watch?v=hZAnV3Q6QMY>.

15 See for instance 'Andrés Segovia demonstrates different timbres of the guitar,' YouTube video, 2'04", posted by 'aasddzxc,' retrieved 9 August 2017, URL: <https://www.youtube.com/watch?v=DJrEl4Nsmg>

stage of modern lute practice, when practice was more diffuse. Simply playing the lute constituted lute technique because it was technique performed on the lute. Indeed, he writes: ‘As far as I know, there is no other tutor, past or present, for the Renaissance lute which presents the technique of the lute as the technique of other instruments is presented.’ In this early attempt to present a lute school, it seems that Buetens confuses the Baroque, Renaissance and modern Classical guitar approaches:

Set the little finger on the soundboard of the lute about two inches from the bridge and as close to the first string as possible without touching it. Stretch out the thumb so it is well in front of the other fingers [... photographs display the Classical guitar, thumb out technique with the thumb seemingly 2 cm or more away from the index finger, and playing with nails on double strung courses.] The thumb moves as a unit, but most of the movement of the index finger is from the middle joint towards the tip. [...] When plucking a double course (all but the top string), both strings can be played if the nails are short and if the angle of attack is correct. [...] Both strings of a course are touched by the flesh of the fingers, and the nail strikes one or both of them for brilliance. Less nail will give less brilliance, and how much nail is to be used must depend on the taste of each lutenist. Nails that are too long prevent the playing of both strings of a pair and give a harsh, unpleasant quality. [...] The classical guitarist have [*sic*] proven that the lute, too, can be played with no [little] finger down [on the lid], and since maintaining the finger on the belly has no positive acoustical value, you should have no qualms about lifting it as your technique develops [...]. The fingers should be held perpendicularly to the strings, and a slight twist of the wrist may be necessary to accomplish this [...].<sup>16</sup>

This is a good example of the point I made earlier, that the modern lute canon (in a wider sense) is a product of present practice in dialogue with the constantly unveiling past, rather than a re-establishing of it. As more sources, research and artistic work develop we find later efforts to present new lute schools that are more informed and reflected.

Twenty-two years later, Diana Poulton published her work *A Tutor for the Renaissance Lute* (1991), in which she presents an approach more

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16 Buetens, *Renaissance Lute*, 5–7.

like lute performance as it is regarded today. Indeed, she has been an important figure in the development of the modern understanding of the entire field of study. Here she constructs her argument in constant dialogue with primary sources. She argues that it was unusual to make colour changes by moving back and forth between the rose and the bridge while playing. She concurs with previously-mentioned literature when promoting a fleshy tone, as the thumb is to touch the strings with the ‘side of the thumb and not the tip,’ with all fingers touching both strings of each course. In her writing, she positions herself alongside those who distance themselves from the Classical guitar, when she instructs us to avoid direct contact between the nail and the strings because it leads to unauthentic sound (cf. O’Brien’s ‘dangerously close’ above; authenticity is discussed in Chapter 6):

The finger nails must be short and must not touch the courses in playing. Except for one Italian teacher, Alessandro Piccinini, in 1623, this point is constantly emphasized, and even he only advocates that the nail should be gently rounded to coincide with the tip of the finger. Thomas Mace, in 1676, suggests they may be used in consort playing. The long nails of the present-day guitar player will produce an entirely unauthentic sound.

[...] The hand is held obliquely across the strings continuing the line of the arm and, in the technique now being described, not at a right angle across the strings. [...] It [the supporting little finger] will lie with the side, and not the tip, touching the soundboard. Although, with this type of technique, the thumb and first finger may touch the courses across the lower end of the rose, it is not usual for the hand to be held directly over the rose as in modern guitar playing [there are examples, however; see Chapter 2].

The movement of the hand up and down the strings in order to change the kind of tone produced is only mentioned by one writer, Piccinini, who appears to have been somewhat eccentric in his time. Other writers, in describing how the little finger is laid on the soundboard use such phrases as ‘this is its constant position’ or ‘as if [it]<sup>17</sup> were glued unto it.’

[...] The thumb must always take the accented note. [...] With the thumb held low and almost parallel with the sixth course, it should move forward and

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17 Poulton’s addition.

downward as if it were going to touch the second finger; the course will then be touched with the side of the thumb and not the tip. This movement should bring the thumb to rest on the course immediately next to it [...].

[...] The [index] finger should be slightly curved and the tip must be laid on the course that both strings are touched. The movement of the finger is not carried through to touch the next course.<sup>18</sup>

Another contributor to the lute performance discourse is Stefan Lundgren. His first book, *Method for the Renaissance Lute* (1991), makes grand assumptions without any explicit, historical grounding. The reader is left to take his word for it. He provides some insight into the mechanics of tone production, but uses little descriptive language to mediate the desired result, except for some examples, such as asking us to obtain a ‘clear, clean and, at the same time, strong sound.’ He does, however, introduce surroundings into the tone-production debate when mentioning the instrument, strings, tuning, actual pitch, acoustics of the room, temperature and humidity. (He gives no further explanation as to how these aspects influence tone production. I will treat these topics in Chapter 4.):

THUMB UNDER: the hand and the fingers are held parallel or nearly parallel to the strings. The thumb is used to pluck the strings behind the fingers in [sic] direction of the palm of the hand and the fingers go around and to the outside of the thumb. In this technique, the little finger supports itself on the sound-board and the strings are plucked with the fingertips.

THUMB OVER: the hand and the fingers are held held [sic] vertical or almost vertical to the strings. The thumb is used to pluck the strings before the fingers and the fingers pluck the strings in the direction of the palm of the hand.

[... In Renaissance music] the alternating stroke between the thumb and forefinger dominated. Because the thumb was always the strongest, it played the first note in each pair of notes. That is how the stylistic effect ‘strong/weak [sic] – strong/weak [sic],’ that predominated the instrumental music of the Renaissance, came about.

[...] How the lute sounds, depends upon many things; the instrument, the strings, the tuning and the actual pitch. The surroundings also influence the

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18 Poulton, *A Tutor*, 7.



sound; the acoustics of the room in which one is playing; even the temperature and humidity etc.

A very important detail in the training of a lute student is the ATTACK. This point is so necessary that it should be given extra time during the practice period.

The stroke takes place in two phases. Fig. 3 [not included here, but it depicts the 'THUMB UNDER' position] shows the first phase. the [*sic*] tip of the forefinger takes hold of both strings of the 2nd course and puts pressure diagonally downwards in the direction of the belly. Up to this point one may only move the finger from the third joint [i.e. metacarpophalangeal joint].

Fig. 4 [not included here, but it is similar to fig. 3 only with the forefinger slightly more bent] shows the finger just after it has left the course. Here [*sic*] the first and second joint [i.e. proximal and distal interphalangeal joints] are bent to keep the finger away from the next course. During these two phases, the finger should not slide over the strings unnecessarily.

One should concentrate upon obtaining a clear, clean and at the same time strong sound [...].

Fig. 5 [not included here] shows the thumb in the first phase. The straight thumb has taken hold of both strings of the second course and puts on pressure diagonally downwards in the direction of the belly.

Fig. 6 [not included here] shows the thumb just after it has left the course. here [*sic*] the first joint is bent to keep the thumb away from the first course.<sup>19</sup>

In his following reworking of the book, *New Method for the Renaissance Lute* (1991), Lundgren provides a clearer historical foundation. The technical and mechanical directions presented in this book do not differ from the previous work, but he now introduces more historical references and puts more focus on tone production (although he does not provide much more detail, he devotes more space to the subject). Again, he promotes a 'clear, clean and strong sound' and draws attention to the environment. The 'striking technique' is divided into two phases: 1) preparation and approaching the course, and 2) pluck and return. He asks us to prioritise the tone before speed: 'Be careful not to sacrifice sound quality to haste.'

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19 Lundgren, S., *Method for the Renaissance Lute*, 5th printing (München: Tree Edition, 1991), 5 and 16–17.

It is implied that he uses wound strings (see Chapter 4 for further discussion) when he tells us that '[t]o avoid unwanted string noises do not slide along the strings when leaving them.'

The sound of the lute depends on many things. The quality of the instrument itself, the strings, the tuning and the pitch. The environment also exerts an influence on the sound; the acoustics of the room in which one plays, the temperature etc. In spite of so many variables it is necessary [*sic*] for the player to master completely the 'striking technique' so that he is able to consistently produce a clear, clean and strong sound. Not enough time can be spent practicing this all-important technique.

I have concluded that the striking technique is best learned if one divides the movement into two phases. The goal of the four-levelled exercises below (a, b, c, d [omitted here]) is to achieve a clear, clean, full and strong sound.

[...] Place your little finger with the first joint laying sideways between the bridge and the rose, approx. 2–4 centimeters away from the first string. [...] *Phase 1.* The thumb is a short distance away from the strings (1–2 cm, [...]). The movement is a combined action of the forearm and the fully stretched thumb. When striking, the left tip of the thumb will hit both strings of the third course and exert a slight pressure towards the sound-board [...]. *Phase 2.* Thumb and forearm will now repel from the strings [...] and take their initial position before the stroke [...]. The tip of the thumb should follow an elliptic [*sic*] line. To avoid unwanted string noises do not slide along the strings when leaving them [...] Be careful not to sacrifice sound quality to haste.<sup>20</sup> (Underlined subheadings in the original have been changed to italics here).

So far, he has not contributed much more knowledge about tone production than in his previous book, but a few pages later he returns to the two-phase approach of the fingers. This time, he promotes more mechanical perspectives by turning our focus to the activities of the joints. Fingers are to move into the instrument ('exert a gentle pressure towards [the] sound-board') which will affect the sound as the strings will move with

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20 Lundgren, S., *Neue schule für die renaissancelaute/New Method for the Renaissance Lute*, 2nd edition (München: Lundgren Music Edition, 1991), 14–16.

the soundboard as it is designed to move (I return to the physics of sound in Chapter 4):

The striking movement of the finger is also divided into two phases. // *Phase 1*. The index finger is a short distance away from the strings (1–2 cm [...]). In a combined movement, which is produced by the forearm and the third joint of the finger, the stretched index finger will hit the third course. The right side of the fingertip will touch the strings and exert a gentle pressure towards [the] sound-board [...]. // *Phase 2*. The finger and the forearm will now repel from the course and describe the aforementioned elliptic line, whereby the first and second joint of the finger are slightly bent [...].<sup>21</sup> (Underlined subheadings in the original have been changed to italics here).

In Frank De Groodt's very brief instructions (2001), we also learn that we should play with the flesh and make contact with both strings of each course.

While holding the instrument, place the right arm and hand parallel to the strings near the back of the rose. [...] Notes are played by alternating the thumb and index finger with an up and down motion so that the flesh of the fingertips contact both courses equally [...].<sup>22</sup>

Andrea Damiani's (1999) instructions are much more detailed than De Groodt's and they concur with many other publications as to how the right hand should be placed. What is interesting to note is the level of detail presented. Perhaps not in what is described, but in how. Included in the book, we find titles such as 'Right-hand position,' 'Right-hand functions' and 'Sound production'; clearly, tone production has been brought to the agenda in a more deliberate manner. The writing is detailed and extensive so I will not dedicate full attention to all of the text, but rather highlight particular cues relating to sound production. First, he divides the stroke into two mechanical functions: one based on the forearm and one on the fingers:<sup>23</sup>

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<sup>21</sup> Lundgren, *Neue schule*, 20.

<sup>22</sup> De Groodt, F., *Learning to Play the Lute: Lute Lessons for the Beginner* (n/a.: n/a, 2001), 7.

<sup>23</sup> Damiani, *Renaissance Lute*.

[... I]t is important to understand that the *r-h* [i.e. the right hand] uses two different techniques:

- *A technique based on forearm movement* that initiates at the elbow joint. In this technique, the wrist, the hand and fingers form an entire unit; the movement that makes the stroke start from the forearm [...]. The rhythmic, percussive sound of the plectrum is typical of this technique.
- *A technique based on finger movement* in which the forearm remains still while the fingers move [...].<sup>24</sup>

These two approaches are further divided into sub-actions where we find cues such as the ‘lower part of the tip’ suggesting flesh, and that the thumb should be stretched out and not bent. Damiani uses a more scientific-sounding language when using words like ‘axis’ and ‘degrees’:

[...] POSITIONING *p* [i.e. the right-hand thumb]

- a) A simple adjustment of the wrist position (in or out) and an equally small turning of the forearm will regulate the angle of *p* on the string; *p* should strike the string with the lower part of the tip. The wrist will often be lower than in the normal hand position [...].
- b) The angle between the *p* axis and the plane of the strings should be around 30 degrees. If necessary, turn the wrist so that you can see the palm of your hand.
- c) *P* should be as straight as possible, but not rigid. Some players may find it more comfortable to bend *p* at the last joint: as this often hides negative tension, it is better to keep *p* stretched and relaxed, as the second joint does not take part in this stroke [...].<sup>25</sup>

Furthermore, the thumb movement is not only located in the thumb, but in the whole forearm. With cues such as ‘moving towards the right leg,’ the whole body enters the tone production discourse and the weight of the arm plays a key role in producing sound:

[...] FOREARM MOVEMENT

- a) Keeping the little finger on the soundboard [...], touch the strings lightly with *p*, keeping *p* still – the movement should come from the forearm.

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<sup>24</sup> Damiani, *Renaissance Lute*, 16.

<sup>25</sup> Damiani, *Renaissance Lute*, 16.

Trusting exclusively in the weight of the arm, the hand can then move in an arc, with the elbow at its centre and *p* moving towards the right leg [...] <sup>26</sup>

Damiani then writes explicitly about the attack, i.e. the beginning of a tone. Rather than looking at spectral features, the discourse again evolves through mechanical procedures. Our attention is now brought to the contact point between fingertip and string. The instructions provided on the nails are much more detailed than previous examples. Although nails are to be avoided in producing the sound, similar to Classical guitar traditions, they can be used deliberately to support the flesh of the fingertip to provide enough friction for the plucked course. This brings previous mentions of fleshy sound into a perspective where some sort of distinction between ‘fleshy’ and ‘too fleshy’ is brought to the agenda. Where the line between the two is to be drawn is left unmarked. Some sort of cue is given when we read that ‘[t]he meaty part of the fingertip will have a negative effect on the attack,’ but how negative it is, and when the effect becomes negative, are left untold. What is interesting about this is not necessarily that it is not described, (how can we describe this in writing?), but rather that it is not even attempted. There is no descriptive language giving hints as to what is to be achieved (e.g. clean, soft, strong, fleshy, bold, etc.); it is left to the eye (*or ear*) of the beholder and what constitutes good tone production is taken somewhat for granted:

[...] ATTACK

This term denotes the contact between the fingertip and the string to obtain the best sound. It should go without saying that fingernails should be kept short so as not to disturb the touch of the fingertips. Where fingertips are particularly meaty, it will be best not to cut the nails too short, but to cut them around the shape of the fingertip to enable the nail to support it. The meaty part of the fingertip will have a negative effect on the attack.

a) Once the hand position has been established, rest *p* on the 2nd course, pressing down on it vertically, toward the soundboard. Make sure you are touching both strings. [...] Normally, the point of contact in making the stroke

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26 Damiani, *Renaissance Lute*, 17.

will be on the lower part of *p*, right next to the nail; a more central position on the meatier part of *p* normally makes the stroke slower and clumsier [...].

In relation to the lack of description of what is to be achieved, it is interesting to read words like ‘best sound.’ This provokes discursive perspectives on the hierarchy between performance technique and sound; that is, whether we are to regard tone production from the bottom-up or top-down perspective. Is the ‘best sound’ a simple, natural product of properly-executed mechanics, thus emphasising technique? Or is the ‘best sound’ in all its subjectivity, ambivalence and cultural context, the primary focus for which the mechanics are constructed and adapted to achieve, thus emphasising aesthetics? If the latter applies, can it be taken for granted? It seems as if Damiani, like many of his colleagues, prefers the bottom-up perspective, but the argument is not entirely consistent. We notice, for instance, that when speaking about the ‘[p]ositioning of *i*’ (i.e. the index finger) it does not say whether the performer is to pluck both the strings of each course with all fingers or if some are only to hit one of the pairs (I return to this idea in Chapter 4).<sup>27</sup> Finally, in terms of the Classical guitar/lute debate, Damiani includes a section on guitarists and their process of starting to play the lute and learning and getting accustomed to play without nails, thus acknowledging the Classical guitar audience.<sup>28</sup>

Another lengthy discussion on tone production can be found in Pascale Boquet’s writing (2008).<sup>29</sup> In a section called ‘Evolution de l’esthétique sonore des différents luths’ (‘Evolution of the Aesthetics of Sound of Different Lutes’) we find a discussion on what characterises the various lute instruments’ sonic qualities and characteristics *per se*, but not how tones are to be produced by the performer.<sup>30</sup> Later on, when writing about the use of various fingers, she explains that both the thumb and index finger should make contact with and pluck both strings of each course, as we have seen before. We also learn that:

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27 Damiani, *Renaissance Lute*, 17.

28 Damiani, *Renaissance Lute*, 18.

29 Boquet, P., *Le secret des muses: Méthode de luth renaissance*, Volume M-1, Nouvelle édition (Paris: Société Française de luth, 2008).

30 Boquet, *Le secret*, 5.

‘[...] Dans tous les cas: prendre les cordes avec un maximum de pulpe (donc avec le pouce plus à plat que de côté), et ne jamais le casser au niveau de la première ou de la deuxième phalange. [...] *L’index*: [...] Il doit être bien détendu, surtout au niveau de la dernière phalange, l’impulsion du mouvement venant des deux premières et de l’avant-bras. // Pour pincer une corde, poser le doigt le plus à plat possible, bien sentir les deux cordes du cœur, *appuyer* vers l’intérieur des cordes, et relâcher en visant une direction diagonale vers le coude (l’index ne doit pas déraiper sur la longueur de la corde). // Le bout du doigt doit toujours être très souple, jamais crochu, le doigt se pliant simplement à 90° environ. Paradoxalement on pourrait presque dire que c’est la corde qui ébranle le doigt, plutôt que l’inverse. Tout aussi paradoxalement, pour obtenir un son bien rond, clair, qui a du ‘corps’ et de la puissance, il faut appuyer sur la corde plutôt que tirer dessus. // Ne pas ‘gratouiller’ la corde trop superficiellement, cela donne un son grêle, sans corps et quasi inaudible.<sup>31</sup> (underline removed from original, replaced with italics)

([...] In all cases: Touch the strings with a maximum of pulp (i.e. with the thumb being flat rather than on the side), and never bend it at the level of the first or second phalanx. [...] [The index finger ...] must be relaxed, especially at the level of the last phalanx [i.e. the distal joint], the impulse of the movement comes from the first two [joints] and the forearm. // To pluck a string, hold your finger as flat as possible, feel the two strings of the course, press the strings inward, and relax by aiming diagonally towards the elbow (the index finger should not slide along the length of the string). // The tip of the finger must always be very soft, never hooked, the finger simply folding to 90°. Paradoxically one could almost say that it is the string that shakes the finger, rather than the reverse. Equally paradoxically, to get a well-rounded, clear sound, which has ‘body’ and power, it is necessary to depress the string rather than to pull it. // Do not ‘scrape’ the rope too superficially; it gives a small sound, without body and is almost inaudible.)

A more interesting remark can be found regarding the right-hand *figuetas* technique, emphasising the weight of the arm and the ampleness of the fingers:

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<sup>31</sup> Boquet, *Le secret*, 32.

Ne pas éviter la différence de dynamique entre ces deux doigts [i.e. le pouce et l'index], c'est elle qui donnera du relief aux mélodies [...] Enfin, ne pas hésiter à faire des mouvements très amples: un mouvement étiqué donnera un son étiqué et petit, un mouvement ample donnera une sonorité généreuse. // Bien sentir, dans ce geste, le poids de l'avant-bras. // Attention: pas de rotation du poignet, seulement un mouvement latéral descendant.<sup>32</sup>

(Do not avoid the difference in dynamics between these two fingers [i.e. the thumb and forefinger], this is what will impart the contour and shape to the melodies [...] Finally, do not hesitate to make very ample movements: A narrow movement will give a narrow and small sound, ample movement will give a generous sound. // Feel the weight of the forearm in this gesture. // Attention: No rotation in the wrist, only a lateral downward movement.)

In Xavier Cauhépé's *The Secrets of the Lute* (2009),<sup>33</sup> Volume 1,<sup>34</sup> we see yet another example of someone distancing themselves from the Classical guitar by stating that it is better to have never played it at all: 'Though apparently similar, the lute and the guitar are worlds apart. The best lutenists to come will be those who will never have played the guitar because, otherwise their fingers will have developed irreversible habits to the detriment of the lute.'<sup>35</sup> When compared to O'Brien's 'dangerously' and Poulton's 'unauthentic [nail] sound' this is the most clear distinction between lute and guitar practice. Lute practice is then argued to be so different that a background within Classical guitar performance will only be confusing and set the wrong premises. This is somewhat interesting because the instructions presented in Cauhépé's book are more detailed and precise than what we see in historical material (cf. Chapter 2) which means that somewhere along the way, he must have added his own additions and assumptions to the lute technique.

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32 Boquet, *Le secret*, 33.

33 Cauhépé, X., *The Secrets of the Lute*, Volume 1 (France: Editions Robert Martin, 2009).

34 Volume II of the same work (2010) makes no new points on the mechanics of tone production, but focuses more on advanced fingering; see Cauhépé, X., *The secrets of the lute*, Volume 2 (France: Editions Robert Martin, 2010).

35 Cauhépé, *The Secrets I*, 11.



Nonetheless, he agrees with earlier literature that the right hand should be placed between the rose and the bridge. Unlike the others, he draws attention to the strings' tension and presents more detailed instructions on the pathway of the thumb. He also uses descriptive words such as 'clarity' (cf. earlier mentions of 'clear'), but adds 'presence' to the discourse and asks us to consider tone production from three perspectives: 1) fullness, clarity and presence; 2) accentuation or attack where relaxation plays an important role in creating projection, leading to; 3) intensity and applied pressure:

We are convinced that lute players composing highly elaborate polyphony on their lutes, in order to emphasize the different voice entries, had to compensate the absence of timbre change in a vocal quartet through a marked stress on voice entries. From a physical point of view this strong accentual value is best obtained with the thumb outside because it balances the index, middle finger and ring finger, which is the best way to render with precision the difference in stress; this favours the independence of polyphonic parts or the stressing of a given note [...]. It [i.e. the right hand] should be located between the rose and the bridge of the lute, not too close to the latter because the vibration nodes of the courses will give the string more rigidity, hence, a harder feel under the fingers [...]. Remember that, on a [Renaissance] lute, the tension of each string is about 3.2 kilograms for the treble and 2.6 kilograms for the other strings. So with such light tension the pressure from the last phalange of each right-hand finger will be sufficient, even to provide each note with a wide variety of accentual weight [...]. If the thumb rests on the fifth course and you draw a virtual line from the base of the thumb to the soundboard, the line will intersect the fourth course. This gives you a much better rest-stroke. Playing the thumb this way affects positively the clarity and presence of the sound. [...] You apply pressure on both strings of the fifth course. [...] Check the following points:

- a) The fullness of the note (its clarity and presence)
- b) Its accentual value (the swifter the thumb leaves the course, the more the sound is projected)
- c) The intensity (it depends on the pressure applied to each string). [...]<sup>36</sup>

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<sup>36</sup> Cauhépé, *The Secrets I*, 35–36 and 41–43.

Rather than Lundgren's two-phase plucking approach, Cauhépé proceeds to divide the mechanical activity of tone production into three stages: 1) preparation; 2) action; and 3) return. He continues to draw attention to the mechanical process of plucking strings, similar to his earlier-mentioned colleagues, but introduces the concept of a 'spring-like' index finger. While his colleagues have spoken of returning the finger to its original place, this 'spring-like' reference also directs attention to the relaxation involved, because a spring-like effect is not achievable with muscular tension as the finger would move too slowly. Thus, with previous mentions of light pressure and this spring-like motion, we can form a practical understanding of lute technique: relaxation and balance. Tone production must balance the act of producing enough force in the right place (there are different ideas of where that might be) with the act of relaxing to increase rapidity and flexibility:

- a) *Getting ready*. You [*sic*] ears can already anticipate the sound, you imagine it as beautiful as possible (i.e., fullness, flowing quality, presence, clarity, elegance) when you apply pressure to the strings.
- b) *Creating sound*. The pressure applied by the last phalange of the thumb or other fingers is released without the least stiffness. The more relaxed and loose you are the more you will project the sound for the benefit of the melodic lines.
- c) *Contemplative phase*. The lute is a plucked-string instrument. This means that once the sound has been created there is no way you can control it. So you appreciate it while it lasts by assessing how you wanted it to come across as to accentuation, sonority, timbre, emotional and spiritual dimension, gaiety or melancholy and so forth. [...] Once the index is in place, the last phalange will apply pressure onto course 1. It must be very supple, spring-like [...]. Press the string so that the tendons of your phalange are stretched out to full capacity. The string is depressed towards the soundboard — at this stage there is an accumulation of energy and weight of the phalange in proportion to the accentual value you want to impart to the note. Releasing the index finger depends on the initial weight applied on the string. The faster your index finger leaves the string, the more sound is projected. Your index finger will have to be repositioned using the same portion of flesh of the last phalange, exactly where you have perfect control

of pressure and poise in order to release the string [...]. As for the sounds produced with your thumb you must master the three phases — preparation and generation of sound, contemplation — then the results — fullness, clarity, presence and accentual value.<sup>37</sup>

Another point brought to our attention in this section is tone consistency. Whereas we earlier encountered Poulton's remark that it was unusual to make colour changes while playing, Cauhépé now writes about 'using the same portion of flesh of the last phalange, exactly where you have perfect control of pressure and poise in order to release the string.' This strongly implies tone consistency.

## Baroque lute

As with the articles, the thumb-outside technique associated with, for instance, the Baroque lute, is much under-represented in the literature. Franz Julius Giesbert, in his *Schule für die Barocklaute* (1940),<sup>38</sup> presents the earliest modern Baroque lute school according to my investigations. This early attempt to present a school for the Baroque lute is, naturally, more concerned with establishing basic lute practice (such as shifting between bass courses with the thumb, fingering and exercises) than with tone production *per se*.

Forty-seven years later, Toyohiko Satoh had his *Method for the Baroque Lute / Schule für die Barocklaute* (1987) published. It clearly presents the perspective of a converted guitarist and addresses readers with previous knowledge of Classical guitar playing. The book appears somehow fragmented, with no historical evidence cited or illustrations. Like some of his colleagues, we are simply asked to trust his word. As we are now speaking of the Baroque lute, we may notice how he asks the performer to place the hand between the rose and the bridge, which is similar to the Renaissance practice but differs from the Baroque aesthetics discussed in Chapter 2. This is made even more clear by his comment that the biggest difference between the Baroque lute technique and the guitar is the supporting little

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<sup>37</sup> Cauhépé, *The Secrets I*, 43–44.

<sup>38</sup> Giesbert, F.J., *Schule für die Barocklaute* (Germany: Schott, 1940).

finger. Although vague on the specifics (i.e. ‘reasonably short’), he opens up for actively using the nails to produce the sound but gives no historical evidence for it. This emphasises and welcomes the Classical guitar approach to the Baroque lute, especially when compared to, for instance, Poulton’s no-nail remarks above and Chapter 2:

Although there was certainly more than one standard right-hand technique throughout the history of the lute, present-day technique on baroque lute is similar to modern classical guitar technique. (See photo.) [He refers to a photograph of his own hand position.] The right hand is normally held between the rose and the bridge, with the thumb extended towards the rose. The row of knuckles forms an oblique angle to the strings, and the little finger rests on the soundboard (the main difference from modern classical guitar technique). [...]

Another essential difference from modern classical guitar technique is that the RH [i.e. the right hand] thumb plays a very important part in the RH technique. The thumb is responsible for the 6th to the 13th courses, as compared to the guitar, where it normally is occupied with only the 4th to the 6th strings.

Although flesh plucking was much [*sic*] common, fingernails were used by some players in the baroque period. Those players with nails should keep them reasonably short, and hold the hand at a more oblique angle, to avoid producing a ‘double-sounding’ note for each stroke [...].<sup>39</sup>

Stefan Lundgren also presented a method for the Baroque lute (1993).<sup>40</sup> He too directs the right hand to be placed between the rose and the bridge but attempts more detailed directions on the finger’s motion. He takes it further than previous examples by including descriptive words alongside technical directions (e.g. ‘slightly,’ ‘firmly,’ ‘roughly,’ ‘slanting,’ and ‘glancing’). Like previous examples, we are asked to present consistent and balanced tone qualities:

[...] Place the end of the first finger on the soundboard between the bridge and rosette with the tip of the small finger resting on the lute soundboard between the bridge and the rosette about 2 centimeters (3/4 inches) away from the

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39 Satoh, T., *Method for the Baroque Lute / Schule für die Barocklaute* (München: Tree-Edition, 1987), 9–10.

40 Lundgren, *Baroque Lute*.

first course. [...] With a small amount of downward pressure, move the [right hand] thumb lightly across the 10th course, coming to rest at the adjacent 9th course. [...] Hold the middle finger tip [*sic*] relaxed and slightly bent over the first course without touching it. Now strike firmly, but not roughly, this course with the finger tip [*sic*] using a first (knuckle) joint movement. This motion begins oblique to the lute top, slanting into the course and glancing outward after the course is struck [...] using a slight bending motion from the 2nd and 3rd joints. [...] Repeat this stroke continuously between the index and middle fingers, always seeking to equalize the evenness of rhythm (here without accents), volume, and tone quality.<sup>41</sup>

Miguel Serdoura (2007 and 2017)<sup>42</sup> presents a refreshing approach, in which not only are the mechanics even more detailed than most of his colleagues, but also where Baroque lute playing is put in more context than before. First, he draws attention to the Baroque lute sonic qualities using words like ‘sweetness’ (*la douceur*) and ‘rich texture’ (*richesse harmonique*), and he promotes an approach emphasising a ‘round (*rond*), precise (*précis, perlé*) and beautiful sound (*beau son*).’ Although the phrasing is no more precise in terms of what it entails in practice than my previous examples, we see new facets of tone production in terms of appearance. Here, we are directed towards ‘harmonic texture’, ‘softness’ and even the aesthetic ‘beauty,’ which takes a more multifaceted and colourful perspective than previous uses of words like ‘clarity’ and ‘presence’:

The Baroque lute’s specific sound quality, its sweetness and the rich texture of its harmonics reside in its double strings, or ‘courses.’ It takes a great deal of patient practice to pluck both strings at the same time in such a way as to produce a round, precise and beautiful sound [...].<sup>43</sup>

La particularité sonore, la douceur et la richesse harmonique du luth baroque résident dans le fait que celui-ci possède des cordes doubles, appelées ‘choeurs.’

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41 Lundgren, *Baroque Lute*, 4–5.

42 The book was initially presented in French in 2007, but appeared in a translation in 2017. I have chosen to present both the published English translation and the French original here.

43 Serdoura, M., *Method for the Baroque Lute: A Practical Guide for Beginning and Advanced Lutenists*. Volume 1, translated by Daniel Ungar. (Italy: Ut Orpheus, 2017), 72.

Pour réussir à avoir un beau son, rond, précis, perlé, nous devons étudier avec grande précision et patience la manière de bien toucher deux cordes à la fois [...].<sup>44</sup>

Serdoura further contextualises the instrument by drawing attention to its limitations, which, as he comments, are obviously subjective and often based on value judgements regarding the instrument's era. Subjectivity and values aside, the more concrete expressive limitations of the Baroque lute are bound up with its volume, which is a product of its small size, relatively low tension and many strings. Similar to Cauhépé, Serdoura also makes a point of relaxation and balance. That is, that tone production must balance the act of producing enough force in the right place (and there are different ideas of where that is) with the act of relaxing, to increase rapidity and flexibility. What is significant in this book is that the so-far standardised cause and effect mechanics are now introduced to a more subjective perspective. Using language such as 'undivided intuition and passion can be unharnessed and we can freely express ourselves, but in such a way as to respect the lute's natural voice, with no obstacles or extraneous influences,' we notice attempts to show more depth and value in regard to the subject. But still we are left to judge for ourselves what this actually means in practical performance. Rhetorically, when do we reach the 'natural voice of the instrument?' (I return to related perspectives in Chapter 4). How do we 'unharness' (in the sense of removing armour) 'intuition and passion?' What are the 'obstacles and extraneous influences?' Clearly, the book format is not capable of mediating fully what tone production is, could or should be, as already discussed. This is where informed play truly comes into practice, because we cannot rely on the performer, book or source alone. We can only create our own understanding of the topic by making the best of each and taking our own informed standpoint:

Every musical instrument has its qualities and limitations. The limitations are obviously subjective, as they are often based on value judgements regarding the instrument's era. The expressive limitations of the baroque lute are bound up

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44 Serdoura, M., *Méthode de luth baroque* (Paris: Éditions de la Société Française de Luth, 2007), 72.

with its volume. The fact that the strings are comparatively slack and come in pairs prevents the lute from having a loud sound in terms of decibels. Therefore, the lutenist must articulate his playing in order to use all expressive nuances available to him. He must seek to render some sort of speech (rhetoric) and a wide range of colors thanks to the lute's deep body, which, with the help of double strings, creates sounds that are rich in harmonics.

The more one uses strength to pluck the strings, the less the lute will sound. This paradox should lead the lutenist to use gentleness in plucking the string.

Certain physical reflexes, such as digital agility, strength, sensitivity of touch, elasticity of arm and finger muscles, back tension, etc., must be developed so that our undivided intuition and passion can be unharnessed and we can freely express ourselves, but in such a way as to respect the lute's natural voice, with no obstacles or extraneous influences.<sup>45</sup> (Bold typeface in subheadings are removed from the original)

Tout instruments de musique a ses limites et ses qualités. Ces limitates sont bien sûr toujours subjectives car souvent liées a un jugement porté sur une époque déterminée. La limite expressive qu'on pourra trouver au luth se situe au niveau de sa puissance sonore. Le fait que les cordes aient [sic!] très peu de tension et qu'on les joue par groupes de deux, empêche l'instrument d'avoir un son puissant au niveau des décibels. Dorénavant, on doit donc chercher à s'exprimer au luth avec toutes les nuances qu'on peut y trouver au niveau de l'articulations, cherchant le discours parlé (rhétorique), et toute une gamme de couleurs grâce a sa caisse de résonance profonde qui, à l'aide des cordes doubles, développe des sonorités remplies d'harmoniques.

Avec le luth, plus on utilise la force sur les cordes, moins il ca sonner. C'est un paradoxe mécanique qui aura pour vertu d'adoucir le toucher du luthiste. Nous devons développer certains mécanismes corporels comme l'agilité des doigts, la force, la sensibilité du toucher, l'élasticité des muscles de nos bras et de nos doigts, la tension exercé par notre dos, etc, afin que toute notre intuition et notre passion puissent voir le jour et s'exprimer véritablement, mais en conformité avec la voix naturelle du luth, sans encombrements ni facteurs parasites.<sup>46</sup> (Bold typeface in subheadings are removed from the original)

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45 Serdoura, *Method*, 74.

46 Serdoura, *Méthode*, 74.

Later, we are asked to play close to the rose (which conflicts somewhat with the results seen in Chapter 2). Once there, Serdoura instructs us to divide physical contact between the designated finger and the courses into two steps: 1) approaching the top string, before 2) touching the lower string. We notice how he goes into more detail than his colleagues. Rather than merely speaking of the course as one entity, he also differentiates between the two strings of each course. This innovatively gives the two strings of each pair a separate function and role, combining ‘the clarity of a single string [...] with the resonance of the lute’s double strings.’ Furthermore, Serdoura is the first to explicitly relate the return of the finger (cf. Cauhépé’s third phase and Lundgren’s second phase) with relaxation (‘relax the finger totally’), which is necessary to ‘produce a sound which is neither rough nor harsh’:

[...] and place your right hand at a distance of two fingers’ widths from the rose [... Photograph excluded]. [...] The courses [: ...] The soft outer edge of the index finger tip [*sic*] will first make contact with the first of the two strings that make up each course. [Photograph excluded. ...] Next, turn your finger a little more toward you in order to feel the second string as well. [...] This technique will enable you to combine the clarity of a single string (like a violin) with the resonance of the lute’s double strings! [Photograph excluded. ...]

The mechanics of the finger movement [...] When the finger touches the course, as described above ... [Photograph excluded. ...] ... you will bend the first joint very slightly toward the soundboard. [Photograph excluded. ...] You will then press the course down toward the soundboard, bending the strings somewhat. [...] In actual fact, the mere pressure caused by the right hand’s weight is sufficient. [Photograph excluded. ...] You should sense that the (very moderate) strength exerted on the course comes, not from the finger’s joints, but rather from the third (metacarpophalangeal) joint toward the top of your hand. [...] The last stage in right-hand finger movement is to relax the finger totally. Its movement should be ample, in order to gain flexibility and thus produce a sound which is neither rough nor harsh. [...] The thumb [: ...] As you did with the index finger, you should first press the first of the two strings that form a course with the outer edge of the soft part of the thumb tip (press downward). [Photograph excluded. ...] Next, turn the thumb a little (downward) in order to feel the second string. [Photograph excluded. ...] The thumb should



be rather straight, but the first joint is slightly bent. [Photograph excluded. ...] Next, use the weight of your hand to let the thumb fall onto the adjacent course, while effecting a small movement with the first joint. [Photograph excluded. ...] (Bold typeface in subheadings are removed from the original)<sup>47</sup>

[...] placez ensuite la main à 2 doigts de distance de la rosace [... Photograph excluded]. [...] Les choeurs[: ...] L'index va d'abord appuyer sur la première des 2 cordes qui forment 1 choeur, avec le coté extérieur de la pulpe. [Photograph excluded. ...] Ensuite, le doigt se tourne un peu plus (vers vous) pour sentir également la deuxième corde. [...] Cette technique vous permettra d'avoir la clarté de la corde simple d'un violon et la résonance des doubles cordes d'un luth ! [Photograph excluded. ...]

Mécanisme des doigts [...] Au moment où le doigt touche le choeur comme décrit précédemment ... [Photograph excluded.] ... vous pliez très légèrement la première phalange vers la table d'harmonie. [Photograph excluded. ...] Vous devrez ensuite exercer une pression sur le choeur vers la table d'harmonie, afin que la corde devienne un peu élastique. [...] En réalité, il suffit d'une simple pression causée par le poids même de la main. [Photograph excluded.] Vous devez sentir que la force (très modérée) que vous exercez sur le choeur vient, non pas de différentes phalanges du doigt, mais de la 3ème articulation situé dans le haut de la main (métacarpo phalangienne). [...] Enfin, la dernière étape du mouvement à effectuer avec les doigts de la main droite, consiste à relâcher le doigt, sans aucune force. Celui-ci devra faire un mouvement ample, pour avoir de la flexibilité, ce qui donnera une sonorité qui ne sera ni raide ni dure. [...] Le pouce[: ...] Tout comme l'index, vous devez appuyer d'abord sur la première des 2 cordes qui forment 1 choeur, avec le coté extérieur de la pulpe [...]. [Photograph excluded.] Ensuite, le doigt se tourne un peu plus (vers le bas du luth) pour sentir aussi la deuxième corde. [Photograph excluded. ...] Quand vous jouez les derniers choeurs, do, si et la, vous devez plier un peu plus la première phalange du pouce [i.e. through the distal interphalangeal joint] afin de ne pas trop crisp-er ni le poignet ni la paume de la main droite. [Photographs excluded. ...]<sup>48</sup> (Bold typeface in subheadings are removed from the original).

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47 Serdoura, *Method*, 77.

48 Serdoura, *Méthode*, 77–81 and 83.

Other authors bring the Baroque guitar into the lute discourse. James Tyler for one, in *A Guide to Playing the Baroque Guitar* (2011), argues that the right-hand technique is the same for the baroque guitar as it is for the [Baroque?] lute (cf. ‘the thumb slightly extended toward the rosette’). What is particularly interesting to note here is that Tyler anticipates future musical periods as well, while most of his colleagues are only concerned with establishing the past. He does this by asking the reader to study Fernando Sor’s *Méthode pour la Guitarre* from 1830, because of its excellent detailed instructions. It is to ‘be studied by all guitarists, even those specializing in the baroque instrument[.]’ This is a rare case, when the author not only acknowledges the Classical guitar discourse, but also includes it as a means of understanding earlier practices rather than how to differentiate it from the lute. From my own personal experience, this is a standpoint that seems to be more accepted within the field of the Baroque guitar than the lute, and perhaps this is a natural outcome given the close relationship not only between the two physical instruments themselves, but also in their names (Baroque *guitar* and Classical *guitar*):

Right-hand technique is essentially the same for the baroque guitar as for the [Baroque?] lute. Most players held their right hand in a position with the thumb slightly extended toward the rosette and the little finger resting on the soundboard about two inches in front of the bridge, except when they played strummed chords. [...] Few technical instructions are provided in the music sources for baroque guitar [...]. But it seems as if the traditional, lute-like technique described above survived not only through the Baroque period, but also, as Fernando Sor’s *Méthode pour la Guitarre* (Paris, 1830) attests, through the Classical. It is therefore recommended that Sor’s excellent detailed instructions, which include several diagrams, be studied by all guitarists, even those specializing in the baroque instrument. [...] As many contemporary lute sources verify, most lutenists and guitarists of the Baroque period did not play with fingernails. This apparently held true during the Classical era as well [...].<sup>49</sup>

Finally, Kind (2014) provides another detailed description of the right-hand technique which he links to tone production. Unlike most of the

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49 Tyler, J., *A Guide to Playing the Baroque Guitar* (USA, Indiana University Press, 2011), 6.

other examples here, this book is only published as an e-book, in Kindle format. Kind provides no historical account or foundation for his methodology, nor does he position his lute-playing approach among other artists and traditions. The sole focus is how to utilise the Alexander Technique based on his own personal account. He focuses on the mechanical aspects of playing too, but his main focus lies more in the execution of music from an ergonomic perspective rather than a sound production perspective. Another difference is that, while most of his colleagues focus on how lute performance should be done, Kind often takes the perspective of why it may not happen and what the performer (possibly) is doing wrong:

If the performer is incapable of producing volume without a harsh tone, then something is wrong with the right-hand technique. This usually happens because the performer is hooking the strings with the middle joint of the fingers and, as more force is applied, the strings slap against the fingerboard. The strings should be struck and not hooked. The finger moves through the course from the main knuckle of the right hand, aiming for the back of the palm instead of hooking the finger into itself. In this process there is some curling in the middle joint, which helps move the finger into the palm at an even reflexive rate. The movement needs to be executed at a naturally reflexive speed so that excessive tension is not caused by trying to force the finger to go faster through the course. You can only move as quickly as your reflexes allow, so you need to trust your reflexes. [...] With the execution and return of the stroke being reflexive, excessive tension is avoided at high tempos and the quality of tone is clear, losing any hint of sounding labored.<sup>50</sup>

Kind also emphasises a similar spring-effect to that we have seen before. Through descriptive words such as ‘fuzzy or indistinct’ and ‘controlled sound,’ he joins the same linguistic pathway as many of the earlier examples given here. Note how he asks us to achieve a balance in tone production between the thumb and the fingers:

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<sup>50</sup> Kind, E., *An Alexander Technique Approach to Lute Technique*. (n/a.: n/a., 2014), Kindle Edition, Lute Technique Specifics, second paragraph.

The action of the fingertip is very important to tone production. The fingertip needs to give backward. If not, the sound will be harsh. Find a position that allows the finger the freedom to strike from the main knuckle and to give at the tip. Imagine the fingertip as a harpsichord quill. As the finger goes through the course like a door on a hinge, allow the fingertip to give backward like the quill of a harpsichord. Giving at the fingertips is the mechanism behind volume control. No matter how softly the performer plays, the speed of attack should not lessen. If the attack slows down, then the tone loses its quality and becomes fuzzy or indistinct. Something is also lost rhythmically, because, if the attack is slowed, then the exact point when the course is released becomes indistinct. Since the speed of attack is not changed, then something else has to change to reduce volume, and this should be the fingertip. I think of the fingertips as guitar picks. When I want a louder sound, it is like using a stiffer pick, and for a softer sound, a more flexible one. The fingertips are allowed more flexibility, backward as the performer produces softer and softer sounds. If the speed of attack is maintained at a reflexive rate, then the release of the notes is precise. Because fingertips give only so far, their release at a high speed maintains the integrity of the note. When using the thumb, allow it the freedom to break downward from the first joint, and do it as reflexively as the fingers. The sound produced by the thumb bending at the tip is a more controlled sound and closer in quality to that produced by the fingers. Imagine the reverse of shooting marbles with the thumb. When shooting marbles, the thumb tip pops out of the index finger to shoot the marble. Let the thumb do the reverse. With the extra control afforded by the thumb tip, the performer can avoid the danger of overpowering treble production with the superior strength of the thumb. If a stronger, fuller sound is desired, then the thumb is used as a single unit whether playing free or rest stroke [...].<sup>51</sup>

## Online resources

We start to see that there is indeed some consensus on how to play the lute in the various books and articles. Obviously, the book genre has been dominating the discourse. This is particularly true as much of the

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<sup>51</sup> Kind, *Alexander Technique*, Lute Technique Specifics, fourth to seventh paragraph.

literature is driven by a mechanical understanding of the subject which needs a certain amount of space to unfold properly, with all the necessary pedagogical aids. It is possible to assume that online sources could provide enough space (arguably infinite space, in fact) to have a similar discourse unveiled, also including audio-visual material. Indeed, we do find several online sources treating lute music manuscripts, but surprisingly few direct themselves explicitly towards tone production. Those of interest in the present context are those sources where we can both see and hear how tone is produced. I will name a few of them here to exemplify.

Stefan Lundgren, mentioned several times above, provides a website called *luteonline.se* containing ‘six short lute lessons,’ but these contribute little compared to his written works. In the second lesson on the right hand we read that one should ‘[h]old the lute from the end of the body. Place the tip of the little finger on the soundboard between the bridge and rosette about two centimeters away from the first course. The fingers are held more or less parallel to the strings [...]’.<sup>52</sup>

David van Ooijen also presents his perspectives on tone production on his YouTube channel. Among numerous films of performed music, we find three films directed at playing technique. The notable film related to the right hand is a sort of recorded ‘slideshow,’ with interchanging texts, photographs and audio-visual material. In the transcription below we find instructions that conforms with earlier presented literature. Here we are asked to play both strings of each course with all fingers:

This is about making a good tone on your lute. Make sure you feel *both* strings of a course, when you touch a course. Make sure you press *both* strings towards the top of the lute. Make sure you release *both* strings at the same time. Place the lute on your lap, top upwards, facing you. [Photograph.] Put your index finger on both strings of the second course. [Photograph.] Press both strings towards the top. [Photograph.] When your finger is almost touching the top, release both strings by turning the finger in the direction of the third course. [Film.] Do the same with the thumb. [Photograph.] Move the thumb in the direction of the first course. [Films.] Only then hold the lute in your usual way. Play slowly with alternating finger and thumb, producing the

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52 Lundgren, *Lesson Two*.

tone you just made. [Film.] *Tone Production on Renaissance Lute*, David van Ooijen, lute, [www.davidvanooijen.nl](http://www.davidvanooijen.nl).<sup>53</sup>

Elisabeth Pallet presents a lute tutorial on her *luteweb.com*. With only a few hints on tone production (e.g. ‘It is important to have control over the sound, allowing the player to express a warmth and intimacy in terms of a musical expression<sup>54</sup>), she only directs the reader to the basic concept of lute technique and some historical quotes.

## They all agree? Then what?

Apparently, most of the literature mentioned in this chapter is in agreement (with few exceptions). This is highly interesting. Clearly, the Renaissance lute has been given most attention and the Baroque lute has been comparatively left more aside. When comparing the treatises to the material unveiled in Chapter 2, we notice how much has been added to the discourse according to modern taste and logic, and that the Renaissance sources are closer to the historical sources than the later Baroque lute instructions (cf. placing the hand between the rose and the bridge in most modern literature versus close to the bridge in historical sources). Modern practice, then, is distinct from historical practice not only in temporal location and situation, but also in their parallel development with each other, without necessarily being equally related at all times. Based on everything that I have discussed so far, and from what the science of interpretation has taught us through time, this is no surprise, but what is noticeable is how much modern literature gives an authoritative impression of the past. What I mean by this is that we can easily get the impression that what is described in present instruction books is how it actually was. We soon get a comforting sense that, by following the text of the authors (whoever we choose to follow), we are indeed learning historically-correct practices rather than modern interpretations and

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53 van Ooijen, D., ‘Tone Production on Renaissance Lute,’ YouTube video, 56’42”, posted by ‘Lute Lessons,’ 13 May, 2012, URL: <https://youtu.be/eAiLytW3Dzs>.

54 Pallett, E., ‘Tutorial,’ *luteweb.com*. Retrieved 6 September 2017, URL: <https://luteweb.com/lute-tutorial/tutorial/>.

re-contextualisation of historical sources. Here, we can further identify two strands of literature. Firstly, the ‘this is my opinion regardless of (explicitly presented) history’ approach; and secondly, the ‘this is a historical stance without problematising or openly re-contextualising in relation to modern play’ approach.

From a publisher’s perspective, it is also interesting to notice how the presentation of these materials does not get the same amount of editorial attention as other literature traditions. Several examples of the literature presented here are self-published, with spelling mistakes and linguistic inconsistencies (in addition to what has been shown in this chapter) that a larger publication machinery would have edited out. This is not interesting *per se*, but it does say something about the process it underwent before being published, because spelling and grammar are easy matters to detect in the traditional editorial and peer-review processes. The statements and approaches presented are more directly transmitted from the author to the reader and, in that sense, more personalised. This is even more true for online resources where there may be no external editorial work whatsoever, such as YouTube-channels, personal websites, blogs, etc.

What is often offered are truths, codes of conduct in which the receiver is to have a certain understanding of the theme to gain a new ‘correct way of doing things.’ It is an offering from one musician to the other, and it is practical in the sense of the performing conditions rather than the sonic. There is little criticism amongst the sources. Even if Poulton and Serdoura, for instance, provide good historical foundations for their arguments, they only present sources which seemingly support their school of thought. There seems to be no tradition of constructive thinking where a ‘truth’ is built piece by piece, but rather a manner of stating ‘the proper way’ and which selected sources support that practice. There is suspiciously little contradiction presented. ‘The finger is to be placed here’ one source may state boldly, but on the grounds presented in the previous chapter we see that practices were varied within the assigned epochs, as well as between them. What happens is a pedagogical upbringing into ‘my way of doing things’ rather than giving the reader different perspectives from which they can form their own, informed approach. In this way, they also speak to a certain social group. This is where it

becomes interesting to see how some literature uses the Classical guitar to guide the performer over to the lute, based on previous experiences and common bases of knowledge. Others seem to deliberately reject speaking about the classical guitar, to show that this is, indeed, something else. It is a practice of its own, not to be confused with the modern guitar. Not talking about the guitar is also a way to distance oneself from it; 'the guitar is not even part of the lute discourse, because ...' Already at this level, the reader is being guided towards a certain understanding of the relation between modern and historical practice, and how we approach it today (according to each individual author). (Of course, when looking at the publishing tradition critically, I also acknowledge that this book that I am writing also offers a certain world view based on my perspective on matters and is, in this respect, no better than others.)

One of the greatest obstacles to writing about tone production, as we have seen, is the nature of literature itself. It is troublesome to write about and 'read' sound because we cannot ensure that the reader understands our words exactly how we intend. Signs and signifiers are culturally and linguistically dependent, and words can be understood differently by various readers, even when resorting to onomatopoeia. Rhetorically, what timbre and tone colour does 'BAAAANG' have? How loud is it? Is it a positive sort of sound, such as a balloon exploding during children's play at a party? Or the more alarming sound of a gas explosion? This is, of course, an old discussion in theory, treated by prominent authors such as Barthes, Derrida and others, but it presents important perspectives to tone production mediated through literature. Here we find a prominent difficulty in our discourse; we have to ask ourselves what is *not* being said, and what is being taken for granted or neglected. Theoretically, what appears in-between literature and sound, theory and practice, are perhaps the most important aspects to address; that is, how the in-betweens shape the discourse and the artistic value of the undecidable. This is where a meta-discussion, above the Classical-guitar-or-not-perspective, is needed.

Both the Early Modern period and the present time have witnessed the introduction of new sound ideologies. The harpsichord made its entrance in the Early Modern period, around the same time that tone production



became richer in transients and ‘metallic’ (see Chapter 2), and the modern Classical guitar appeared, which made a kind of stance against the popular and folk music approach, which again preceded today’s lutenists. Here we find two very different aesthetics which set the standard for what we perceive as tone production and, as written in some of the sources above, ‘beautiful sound.’ This is a particularly important distinction, as Early Modern musicians seem to have dedicated themselves to the prevailing musical tradition of using the contemporary instruments at hand, while modern musicians often attempt to grasp a larger historical timeline using various techniques and instruments, from different countries. (Seen from a historical perspective, the interest in reconstructing the past anew is rather a modern phenomenon.) How we relate to this information when constructing our own informed sense of tone production will be treated in Chapter 5, but first it is necessary to look at tone production from a physical perspective with the aim of gaining an understanding of how lute sound is constituted by physics and material selections.

## CHAPTER 4

# Something moves

*‘Nothing happens until something moves.’*

—Albert Einstein

Although it is always interesting to know what historical sources have to say, and what our present colleagues think, about matters concerning tone production (see Chapters 2 and 3), there is one aspect that we can only find out on our own: how can our own instrument sound good to us according to our own taste? This is not a matter governed by historical instruments but by our own ability to treat the modern instrument at hand, and make it sound in a manner that is not only pleasing to us but also projects well in a certain space. The lute is known as a soft instrument, but with the right treatment — i.e. playing technique, placement of the performer, instrument selection, instrument set-up and choice of music — it can in fact be heard easily in surprisingly different contexts, even without using microphones (which I return to in Chapter 6). The present chapter will take a more physical turn than other chapters in this book, because the very foundation of a sounding instrument has to do with its construction and performance, i.e. its physics. Understanding the physics of an instrument is the key to understanding cause and effect, which in turn provides a more empirical foundation for conceptualising sound; it also provides us with the necessary tools for self-development and problem solving. To separate topics for the sake of clarity, I will leave psychological perspectives on how we perceive, like and develop tone production until Chapter 5, where the physical aspects presented here will be compared

to the historical (Chapter 2) and modern (Chapter 3) directions already presented.<sup>1</sup>

Being a musician is, in part, being an artist of perception and physics. When we play a tone, we initiate a chain of reactions among air particles (to take a normal musical performance as an example) that a listener perceives and feels in a certain way. In order to understand sound and tone production, it is vital to understand that there is much more to sound than just air waves being produced to create music; in fact, ‘soundwaves’ is just a figure of speech. To me, at least, there is indeed a greater poetry in physics than just a transportation of sound from performer to listener; understanding the nature of sound makes that ‘transportation between A and B’ something dynamic, (partly) controllable and, in fact, something living. It can become part of the instrument and part of the performer, who can actively use physical principles to create music that mediates what they as performers intend to mediate. By understanding how sound actually works, the lutenist is left with the opportunity to make informed decisions in their tone production and form their own concept of ‘good’ sound — ‘this sounds like this because ...’ or ‘to get the sound I want I have to do this,’ for instance. Deep knowledge of how things work can alter tone production to being something more than a habit; it can become a form of design or sculpting. Informed play, as I presented earlier, is thus more than simply reading sources and literature; it is also knowing what you are working with, how to affect the sound and how it develops over time. Furthermore, it helps to better understand sound biologically, i.e. as something developing over time, perceived as the sum of all its actions and reactions. The physics of lute sound is very concrete, very definable and therefore exemplifies the biological development of sound, before we, in later chapters, introduce more subjective concepts, such as psychological perspectives and sound recording, as well as drawing lines back to past chapters.

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1 For those interested in a historical discourse on the development and history of the lute; see Smith, D.A., *A History of the Lute from Antiquity to the Renaissance* (Canada: The Lute Society of America, 2002).

## Sound behaviour as foundation for conceptualising tone production

Understanding how lute instruments, or any other instruments for that matter, produce sound, requires a basic understanding of the physics and mathematics of sound development and propagation. In this section, I will focus on basic sound physics, addressing some fundamental features which will serve as the starting point for later discussions in this chapter.

Although sound is often represented using waveforms, it is vital to understand that sound is not actually propagated in waves in the traditional sense, often represented by a line going up and down around a centre line in an illustration; this is merely a mathematical way of describing air behaviour in terms of pressure changes over time. To fully understand sound propagation we must start elsewhere, outside the realms of mathematical representations and within the realms of relationships. The air surrounding us is full of small particles; without particles, we would find ourselves living in a vacuum. To put it simply, each individual particle has its natural, preferred place in a three-dimensional space. When a tree falls, creating a loud noise, it displaces the air particles, forcing them to leave their preferred space. When displaced, they get 'homesick' (figuratively) and try to go back home with such a force that they go too far the other way, and so it continues in an oscillating manner with less force each time (due to friction, etc.) until the air particles stand still in their resting place. This is, of course, a figurative manner of describing the process. When only considering one single particle the concept is easy enough to understand; it is almost like bungee jumping. But when that single particle moves, it collides with other particles and a complex chain of reactions is set in motion; hence the analogy of relationships, because everything happens as cause and effect, where everything depends on and relates to each other. Already here, then, we can perceive the biology perspective since each particle development creates actions and reactions that, in sum, produce complex air particle movements that we, through our auditory systems, perceive as sound. Indeed, this cause and effect is so powerful that it is also perceivable in silence. Consider, on one hand, the discomfort we perceive when there is no sound at all (such as in Microsoft's silent chamber), and on the other hand, deaf composers being able to experience music through vibrations.

The concept of sound is both something very concretised (through physics) and abstract (through cognitive and metacognitive perspectives), and it relates so strongly to its opposite, silence, that its impressive impact is inevitable whether it is ‘there or not.’

We can speak of two important sound features: firstly, the force, i.e. how far away from ‘home’ the particles are (its amplitude); and secondly, how many times per second they move back and forth (its frequency). Starting with amplitude, the sound pressure level can be measured using the traditional unit for pressure, namely pascals (Pa). The human auditory system can normally perceive sounds starting at a level of approximately 0.00002 Pa ranging up to 100 Pa, where our hearing begins to become seriously impaired. A measuring scale between 0.00002 and 100 naturally presents difficulties in practise, due to the vast amount of levels in-between. To make this range more convenient and easier to handle, it is normal practice to employ a mathematical approach called logarithms, employing the decibel unit (dB) rather than pascals. The basic principle of logarithms serves sound physics very well, in that it makes the range between 0.00002 Pa to 100 Pa more manageable and also better represents our perception of amplitude. Basically, in logarithms, what we are asking is how many of the same number we need to multiply to reach another number. For instance,  $2 \times 2 \times 2 = 8$ , suggesting that we need to multiply three 2s to reach 8. This can be expressed as  $\text{Log}_{20}(8) = 3$ , where the number in brackets represents the number we wish to reach, and where the number following the Log explains what base we are using. The power of logarithms to treat large ranges of data is quickly evident if we use 20 as a base ( $\text{Log}_{20}(x) = y$ ):

$$\text{Log}_{20}(20) = 1$$

$$\text{Log}_{20}(400) = 2$$

$$\text{Log}_{20}(8,000) = 3$$

$$\text{Log}_{20}(160,000) = 4$$

$$\text{Log}_{20}(3,200,000) = 5$$

$$\text{Log}_{20}(64,000,000) = 6$$

$$\text{Log}_{20}(1,280,000,000) = 7$$

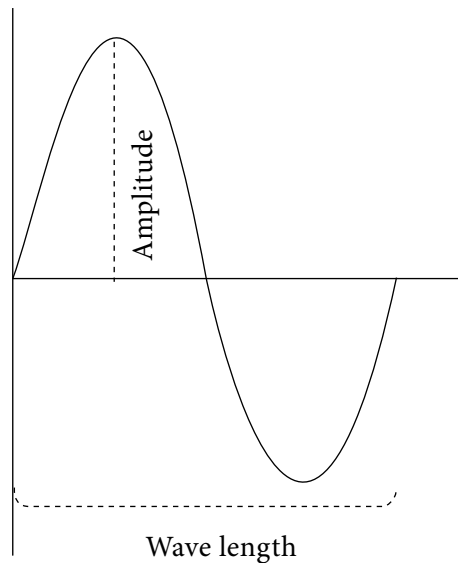
$$\text{Log}_{20}(25,600,000,000) = 8$$

$$\text{Log}_{20}(512,000,000,000) = 9$$

$$\text{Log}_{20}(10,240,000,000,000) = 10$$

As seen above, we can express a range of values stretching from 20 to 10,240,000,000,000 using only 10 numbers. If we say that 0.00002 Pa is 0 dB, we will find that 100 Pa is 133.97 ... dB, which is an easier range to deal with.

There is a good reason why I talk about logarithms, pascals and decibels in a book treating the lute. This is because understanding the difference between linear and logarithmic thinking provides the entire foundation for how we work with sound, how it is represented in illustrations and (later in Chapter 6) how we can use sonic features to sculpt our tone production throughout a music-production context, ranging from live performances to recording sessions. This is where the traditional, mathematical representation (i.e. Fast Fourier Transform or FFT) of sound actually becomes valid, because it describes the amplitude's development over time (see Fig. 4.1 below). Returning to the analogy above, the centre line represents 'home', movement above the centre line represents positive pressure, which is when the air particles are displaced by the above-mentioned tree, and movement below the centre line represents negative pressure, where the particles wanting to go 'home' go too far. The FFT graph enables us to view sound development over time, and it is easy to see where the popular expression of soundwaves stems from.

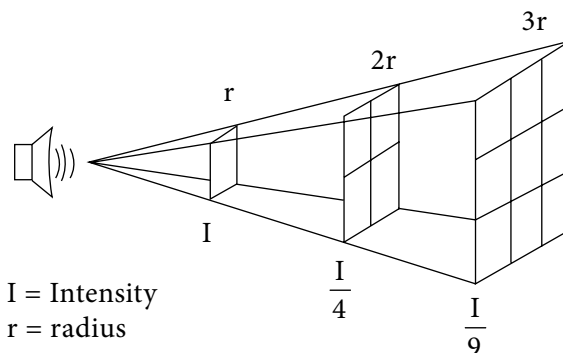


**Figure 4.1.** A Fast Fourier Transform showing air-particle movement over time.

Shifting focus to frequency, the distance from one positive peak to the following positive peak is called one wave length, period, or full cycle (usually described in mathematics as  $\lambda$ ; see Fig. 4.1 above). Similarly, the distance between a negative peak to the following negative peak is also one wave length. Simplified, one can say that a cycle is the sum of both one positive and one negative movement. The number of full cycles per second determines the frequency of a sound, that is how ‘high’ or ‘low’ we perceive them to be. A tone of 15,000 Hz, or 15 kHz, for instance, means that the sound reaches 15,000 full cycles per second; equally 10 Hz means 10 full cycles per second.

But there is much more to sound than the two-dimensional aspect of frequency and amplitude represented by the FFT graph. Sound does not propagate directionally, like a laser beam, but rather hemispherically (see Fig. 4.2 below). This means, in practise, that the further away from the sound source the chain of reactions between air particles moves, the more space the same air particles have to function within, ultimately resulting in less power; the air particles a sound meets also provide friction to slow down the movement. In sum, this means that amplitude decreases depending on the distance from the sound source (a fact that you do not have to be a physicist to experience in real life).

In fact, there is a logic to this decrease of amplitude over distance that can be formulated as double the distance equals minus 6 dB ( $2 \times d = -6\text{dB}$ ). Changing listening position from 16 to 8 metres distance produces the same amplitude increase (in decibels) as from 4 to 2 centimetres.



**Figure 4.2.** Illustration of how sounds propagates hemispherically.

This, in turn, means that one will experience less difference in amplitude when moving around far away from the instrument than if having the ear moving around right next to the soundhole. Conceptually, this is important when discussing lute sound production because it gives us points of departure to better understand lute sound propagation over distance and, together with frequency and amplitude, we are in fact given the tools to talk about physical processes and use a common language to further develop the biological cause and effect phenomena that sound propagation really is.

## Sound propagation and lute construction

It may be easily forgotten that technology does not only imply objects with electrical cords. The lute itself is a form of technology, and the lute sound as a concept begins already at the level of the lute instrument as a physical entity. This means that choosing a certain lute is also to choose a certain framework and foundation for sound. We notice, for instance, how instruments built in the 1970s and 80s are designed using a different ideology than certain instruments built today. This relates to how the frequencies in its tone are balanced (common adjectives used in this sense are often ‘rich,’ ‘feeble,’ ‘mellow’ or ‘rich on transients’), the thickness of the lid and the back of the instrument, the spacing between the lid and the strings, to name just a few of the differences.

The designs of various sorts of lutes are very much bound up with historical findings, as luthiers (i.e. lute builders) mostly seek to bring to life older authentic lutes rather than develop new instruments (one exception are the *Liuto Forte* lutes,<sup>2</sup> that have been appropriated to be more suitable for modern guitarists). However, experimentation with instruments has always been on the agenda. This is obvious since new instruments have always been developed, but we can also read written accounts on the matter. Mace (1676), for instance, writes about the invention of his two lutes in one instrument, the *dyphone*: “The *Occasion of Its Production*, was My

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<sup>2</sup> See *Liuto Forte*. Retrieved 4 June 2017, URL: <http://www.liuto-forte.de>.



*Necessity; viz. My Great Defect in Hearing; adjoined with My Unsatiated Love, and Desire after the Lute; It being an Instrument so Soft, and Past my Reach of Hearing, I did Imagine, it was possible to Contrive a Louder Lute, than ever any yet had been [...].*<sup>3</sup>

Historically, Wachsmann et al. informs us, the arched backside of the lute consists of an odd number of thin strips of wood<sup>4</sup> that are glued together and reinforced on the inside of the lute by strips of parchment or paper. When the size of the body increases, the number of ribs also increases (rather than simply widening the existing ribs). The ribs are normally held together by softwood (see subsequent section for explanation) at both ends, usually by a block at the top to interconnect with and support the neck. The soundboard is often constructed out of at least two thin, straight-grained plates (usually about 1.5 mm thick) of softwood, depending on the size of the instrument. From the 1590s on, ebony or some other type of hardwood was introduced along the border of the soundboard as a protective measure; however, as a trend developed of exchanging the more modern soundboard with an older one, the older solutions made a comeback to the instrumental design; only this time, the edges were wrapped in cloth or parchment.<sup>5</sup> The bridge was glued directly onto the soundboard and was usually crafted out of hardwood from pear, plum or walnut trees; strings were attached to it by pulling each string through a small, drilled hole and then looping it around itself, to secure it from losing its grip when the string is being tuned up to its proper pitch. To avoid distortion, due to the high tension of the strings, transverse bars are glued onto the underside of the soundboard, preferably from the same material. They function both to divide the soundboard into smaller, high-frequency resonant sections — favouring the harmonics of the string ( $f_1$  or higher) rather than the fundamental frequency ( $f_0$ ) — as well as adding support to the lid.<sup>6</sup> It is clear, then, from Wachsmann and his colleagues' description of historical

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3 Mace, *Monument*, 203.

4 The type of wood used for the ribs does not seem to have been standardised and depended on what was available.

5 Wachsmann et al. suggests that the practice came into use 'possibly to cover pre-existing wear;' see Wachsmann, K., 'Lute,' in *Grove music online, Oxford music online*. Retrieved 18 July 2013, URL: [http://www.oxfordmusiconline.com/subscriber/article\\_citations/groove/music/40074pg3](http://www.oxfordmusiconline.com/subscriber/article_citations/groove/music/40074pg3).

6 Wachsmann, *Lute*.

lutes, that it consists of many smaller parts, joined together into a whole. To understand how this constitutes lute sound, we must again turn our attention briefly towards some basic physics. Through the mathematical calculations accompanying the spring-mass system, we learn that all objects have a preferred frequency in which they oscillate depending on mass density and tension.<sup>7</sup> For instance, an anvil will have a higher frequency pitch upon beating it with a metal stick than would a smaller piece of wood, as the anvil has a higher mass density; tuning a lute string up heightens its pitch as the tension in the string increases. This was known already in the Early Modern period. Mersenne (1636), for one, said that the pitch produced by a string relates to the string's length, density, diameter and tension, and that length and diameter could compensate for the low density of gut strings;<sup>8</sup> consider the long bass strings of a theorbo and archlute (see Fig. 4.3). Also Mace (1676) writes that '[...] (indeed) *Length of String*, in any *Instrument*, causeth *Bravery*, and adds *Lustre to the Sound of That String*.<sup>9</sup>



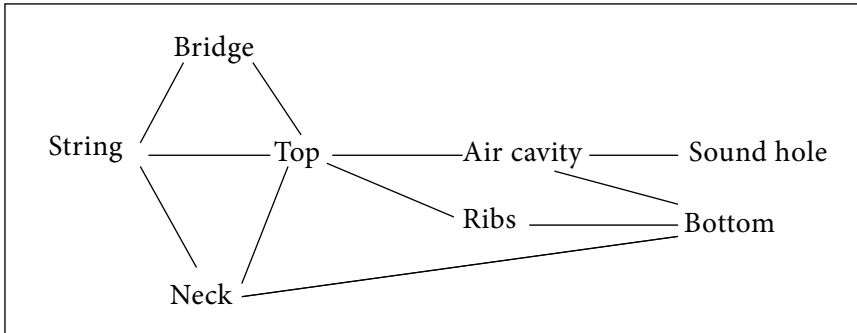
**Figure 4.3.** My own theorbo with long bass strings, built by Lauri Niskanen. Photo: Robin Rolfhamre.

If we look at the individual parts of a lute we realise that it actually consists of multiple oscillators made of different materials, densities and tensions that create lute sound as they work together (see Fig. 4.4 below, bearing in mind that each part mentioned further consists of smaller pieces glued together). Lute sound then becomes a symphony of the mass

7 Schnupp, J., Nelken, I., and King, A., *Auditory Neuroscience: Making Sense of Sound* (USA: MIT Press, 2011), 3–5.

8 Weinreich, G., et al., 'String,' *Grove Music Online, Oxford Music Online*, Oxford University Press. Retrieved 30 May. 2017, URL: <http://www.oxfordmusiconline.com/subscriber/article/grove/music/45984>.

9 Mace, *Monument*, 208.



**Figure 4.4.** The lute is constructed of multiple parts that function as oscillators.

density and tension of each part and their interaction as they are adjoined to one another — lute sound is the sum of its components and its construction. As we will see, the same equation (i.e. lute sound = part + part + part ... + part) can be followed throughout the production chain towards a live performance or the sound file played through your hi-fi system at home (see Chapter 6). Thus, choosing a certain luthier is also to choose a certain concept for sound production. Compare instruments built in the 1970s and the 1980s with more recently built instruments and you will find that they often differ a great deal with regard to construction, tone quality, loudness, distance between the lid and the strings, etc. So, choosing an instrument is also to choose a certain framework when developing our concept of ‘good’ lute sound and it sets the premises, not only for the sound coming out of the instrument, but also for how we relate to it both artistically and technically. It is, therefore, highly interesting and relevant to discuss wood as it makes up the vast majority of a lute, especially as it presents various perspectives that are both constant, subject to nature and subject to us as performers.

## Wood and the elements

Thomas Mace (1676) makes a great point of the synergy between instrument, strings and moisture. He emphasises the necessity for keeping moisture at an acceptable level to keep the instrument in shape, ease the handling of it while playing and, most interestingly, improve its tone production. Mace lays down seven good reasons for storing the lute properly:

And that you may know how to *shelter your Lute*, in the worst of *Ill wathers*, (which is *moist*) you shall do well, ever when you *Lay it by* in the day-time, to put *It into a Bed, that is constantly used, between the Rug and Blanket*; but *never* between the *Sheets*, because they may be *moist* with *Sweat*, &c.

This is the *most absolute and best place to keep It in always*, by which doing, you will find *many Great Conveniences*, which I shall here set down..[sic]

As, First, for the *saving* of your *Strings from Breaking*; for you shall not spend *half so many Strings* as another, who lays their *Lute* open in a *Damp Room*, or near a *Window*, &c.

2dly. It will keep your *Lute constantly in a Good Order*, so that you shall have but *small Trouble in the Tuning of It*.

3dly. You will find that it will *Sound more Lively and Briskly*, and give you *pleasure* in the very *Handling of It*.

4thly. If you have any *Occasion Extraordinary* to *set up your Lute* at a *Higher Pitch*, you may do *It safely*; which otherwise you cannot so well do, without *Danger* to your *Instrument* and *Strings*.

5thly. It will be a great *Safety to your Instrument*, in *keeping It from Decay*.

6thly. It will prevent *much Trouble*, as in *keeping the Barrs from flying Loose*, and the *Belly from sinking*.

Now these six considered all together, must needs create a *seventh*, which is, *That Lute-play must certainly be very much Facilitated*, and made *more Delightful Thereby*. [...]

I have now done with *Those Reasons*, why I would have a *Lute* kept most constantly in a *Bed*, when it is in *daily use*; But at other times, when it is *not used*, a *good warm Case, lined with Bayes within, and covered with Leather without, with Lock and Key, and Hasps*, will be very necessary.

Yet *All These* are *not a sufficient security* for *It*, if it should stand in a *Damp Room*, for then both *Lute and Case* will be all *mouldy*, and *Come in pieces*.

Therefore care must be taken that *It* always stand in some *warm Room*, where a *Fire is constantly used*, or (next to that) upon your *Bed-Testor*.

Let *This* suffice for keeping your *Lute safe*.<sup>10</sup>

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10 Mace, *Monument*, 62 and 64.

Various sorts of wood are often categorised as *hardwoods* and *softwoods*. The difference between the two is not necessarily that one is hard and the other is soft, but that hardwoods comes from flowering plants (*angiosperm*), including oak maple and walnut, while softwoods comes from evergreen conifers (*gymnosperm*), including pine, spruce, cedar, yew and redwood. Softwoods tends (with some exceptions) to have a lower density and faster rate of growth than hardwoods. At a cellular level, hardwoods contain pores while softwoods do not which, logically, means that they are affected differently by humidity. Some instruments made with a lot of ebony (hardwood) in the neck,<sup>11</sup> or with ebony back ribs, seem to be more unstable when the climate changes than instruments with more softwood components. This is important in order to understand lute making in a historical context, because today we travel between different climates to a much greater extent than an Early Modern musician would have done. Indeed, it would not be unusual for a professional musician to find themselves in Kristiansand, Amsterdam and maybe even somewhere in Asia during the same week. This is in addition to the differences in temperature and humidity on the ground when the instrument is loaded on an aeroplane versus the very different climate and air pressure when flying at high altitudes. (This, of course, also affects non-wooden parts, such as the gut frets, which can seem drier and looser when arriving at the final destination than when the journey initially started.) *The Wood Database* clarifies the relation between wood and humidity from a *hygroscopic* perspective: ‘This means that wood, almost like a sponge, will gain or lose moisture from the air based upon the conditions of the surrounding environment.’<sup>12</sup> Additionally, it also expands and contracts according to the same conditions, which is often the reason for cracks and other problems related to wooden instruments. When temperature and humidity change, wood contracts and expands as it exchanges vapour with the

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11 We can read in *The Burwell Lute Tutor*: ‘The flat part of the neck of the lute and the bridge are to be made of ebony; but to cover the head [and] the back of the neck with it as some do, ‘tis improper because it makes the lute too heavy upon the left hand, the neck cold and slippery for the thumb, and the frets are never fast’; see Dart, *Burwell*, 11.

12 The Wood Database, ‘Wood and Moisture’, *wood-database.com*. Retrieved 6 September 2017, URL: <http://www.wood-database.com/wood-articles/wood-and-moisture/>.

surrounding air, according to given principles. It does so according to the fibres and its original position in the tree from which it came.

Wood undergoes several stages of humidity during its journey from a tree to becoming part of an instrument. The first is when it is newly cut from the tree (called the ‘green state’), when it contains both bound water (trapped within the cells) and free water (liquid in pores and vessels). During exposure to air, it will immediately begin losing free water, without contracting or changing its dimensions given that the bound water is still intact. When all the free water has evaporated from the wood, it reaches its fibre saturation point (FSP), when it will begin to lose its bound water and reduce its volume; the green state now turns into a drying state. The bound water will, however, not be at a lower percentage than the surrounding humidity and temperature (i.e. relative humidity; RH). If the RH is 50%, the bound water of the wood will be 50%, where the percentage represents the weight of the water as compared to its oven-dry weight (i.e. 0% bound water). This point of stabilisation between RH and value below the FSP is called the ‘equilibrium moisture content’ (EMC), and it will change in accordance with the surrounding air temperature and RH. According to *The Wood Database* ‘Most interior buildings are kept between 30 to 60% RH, corresponding to 6 to 11% EMC. Exterior values can be much more variable depending on locale and season, but averages typically range from 30% to 80% RH, corresponding to 6 to 16% EMC.’ Keeping the room’s relative humidity in accordance to the instrument’s EMC prevents leaving the wood too dry (swelling the material during the humid summer) or leaving it too wet (leading to cracks and splitting in the dry winter). The same source adds ‘In this way, the wood is most likely to remain as close as possible to its intended size and shape.’<sup>13</sup>

What can be learned from *The Wood Database*’s remarks is not only that the relationship between RH and the instrument’s EMC is a matter of maintenance, keeping the instrument in shape, but also that the relation between the two affects the instrument’s tone production; stiffer, more contracted wood conducts sound propagation differently from slacker, more relaxed wood. Recall the spring-mass system mentioned earlier in

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13 *The Wood Database, Wood and Moisture.*

this chapter; when tension and density changes, so too does the preferred pitch of the material and the resonance becomes altered as well.

If one is unfortunate, the climate can result in the wood bending as it shrinks, in relation to the original centre of the tree from which it came. According to Tim Padfield, this can be seen clearly in crackled, wooden antiques from China, where both wood and lacquer have dried out and shrunk over time, but at different rates, resulting in a crackled surface. This is because Chinese lacquer is applied at high relative humidity to speed up the hardening process, while in the present, it might be exposed to the modern, temperate indoor climate.<sup>14</sup> This is also why instruments sound different depending on the season and geographic location, and why we must account for these changes in our playing technique.

## Strings

Strings also react to the surroundings, of course, and choosing the right strings for an instrument is vital for how the instrument sounds; indeed, Descartes and others spoke of the strings as the ‘nervis testudinis’ (‘nerves of the lute’).<sup>15</sup> The modern performer can choose from a range of materials, including PVF carbon, nylon, nylgut, various sorts of gut, wound strings, metal strings, rectified, lacquered and other less common inventions. Choosing the right material has several practical purposes: 1) It helps to get the proportions right for the instrument to produce what we perceive as the right tone quality. Some instruments call for nylgut to unleash their full potential, while others call for PVF or some other material. Sometimes a combination is best; 2) It prevents the string from breaking when tuning the instrument to the desired pitch; 3) It prevents the bridge from jumping off the soundboard as a result of too much pressure from the strings together. We have already seen that pitch is related to density, tension and, as Mersenne pointed out earlier, also length. This is why different reference pitches call for different strings. Compare the

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<sup>14</sup> Padfield, T., ‘The Reaction of Wood to Changing Climate,’ *Conservation Physics*. Retrieved 22 April 2016, URL: <http://www.conservationphysics.org/wood/wood1.php>.

<sup>15</sup> Descartes, R., *Musicae compendium*. Translated by T. Harper (Utrecht: Trajectum ad Rhenum, 1650), 12.

different dimensions of the strings on a Renaissance lute in G with a mensura of 60 cm tuned in 392 Hz, 415 Hz and 440 Hz respectively (see Table 4.1 below). The tension of each string is presented in N (Newtons) and not all the strings are presented. Here, we clearly see how the length of the string remains unchanged, but the dimension and tension alter to match the desired pitch. In Table 4.2 we also see how the dimension of the string changes when we alter the material of the string. This is a consequence of the differences between the materials' densities.

**Table 4.1.** Comparison between different reference pitches using gut strings.

Pitch for 60 cm mensura (in this case, gut)	Reference a' = 392 Hz	a' = 415 Hz	a' = 440 Hz
g'; tension: 38 N	0.46	0.43	0.41
d'; tension: 32 N	0.56	0.53	0.5
a; tension 30 N	0.73	0.69	0.65
f; tension 30 N	0.9	0.85	0.8

**Table 4.2.** Comparison between various types of strings over the same reference pitch.

Pitch for 60 cm mensura (in this case, gut); a' = 440 Hz	Nylgut	PVF Carbon	Gut	Nylon
g'; tension: 38 N	42 NNG	0.35	0.41	0.46
d'; tension: 32 N	50 NNG	0.42	0.5	0.57
a; tension 30 N	66 NNG	0.55	0.65	0.73
f; tension 30 N	79 NNG	0.68	0.8	0.91

## Historical sources

Historical strings are somewhat difficult to discuss in terms of tone production. The climate then and now is very different and the diet of animals has also changed, which again affects the quality of the guts. It is therefore not productive, from a performance perspective, to spend much time discussing earlier manufacturers across Europe (which was a relevant theme to discuss at the time, of course). I will rather direct attention to instructions regarding tone quality and ensuring the quality of strings.

There are several interesting remarks regarding strings to be found in the more practical sources. Vincenzo Capirola (c. 1517) describes how gut



strings are thicker at one end than the other and how it matters which way they are put on.<sup>16</sup> If they are put on the wrong way, they become false (i.e. out of tune). It is, therefore, important to get the two strings from the same length of gut so as to ensure that they are the same. If one is thicker than the other, it should be placed on top. Similarly, if one string of a course is bad, it doesn't matter how good the other is as the false string ruins the sound collectively:

Sapi che le corde sono fare de budeli de castroni: Et il cao del buclo sempre, e piu grosso che in fin: [...] Et replico come le se die ligar sul lauto, El contrabaso, et bordon, liga dal cao grosso, El tenor, mezane, sotane, vi ligade dal cao sottil [...] Nel bater la corda da veder, si sono bona, et iusta, per meter sul lauto, batila con la man destra per che anche nel sonare tu bari dal segno cun la man destra. Et fa che el cao longo, zoe el piu dela iavera stia nela man Zaneba, et la corda che son iusta bura do filli seguenti da un cao a laltro, et sapi, liga il cao piu iusto dal scagnello, Ancora sapi che si la[ ] corda te burase tre filli, o, g. Seguenti da[ ] un cao a laltro, faria ancora asai bona corda, Ma advertisi de acompagnar sempre la sua compagna de guela instesa bota zoe silabura .3. fili metili apreso unaltra da .3. fili, et cusi fa corda che non par false [...] Et si per sorte diro le mezane, o sotane no sacordase, et che fuse iuste, muda la corda da cao apie che forsi tacordara per la rason sopradita, per che ogni volte in le corde sotil non si puo cusi veder qual sia el cao piu grosso, o piu sotil da ligar sul scagnello, che per q[u]esta rason anche non fa[ ] corda. Et etian sapi a mudando la corda da cao a pie tacordara per [que-?] staltra causa che sara insta la corda dann cao che dal[ ] altro, ac etia sapi che nel ligar che fai la corda si lasasti inver il cagnelo in deo che corda falsa per sorte, non acordaria che te faria poi tuta la corda dalsa, cava mia la corda et rebatilla dare[ ] cao, et va provando, et facendo experientia [...] Et le mezane, et sotane, si per caso una fuse piu graseta del[ ] altra, meti sempre la grosa de sopra. Et etiam sapi che una corda falsa apreso de una insta mai tacordara, ma piu tosto de false aun [...] per che come il tasto, e piu propinguo a[ ] le corde, le corde adir cusi arpiza, et par mior el lauto [...].<sup>17</sup>

16 This is because the parts of the gut used for strings are naturally thicker at one end than the other; see: Larson, D., *Making Gut Strings*. Retrieved 12 June 2017, URL: <https://www.gamutmusic.com/new-page>.

17 Capirola, V., *Compositiōne*, ff. 3v–4r. For translation, see Marincola, *Capirola*.

(The strings are made from the gut of *castroni* [...] and the gut is always thicker on one hand than it is on the other [...] I shall repeat how to tie the strings on a lute: the 'contrabaso' and the 'bordon' from the thicker end, the 'tenor', 'mezane' and 'sotane' from the thinner end. [...] When you pluck a string, to check if it is good and right to put on the lute, pluck it with the right hand. As, when you play, you pluck it with the right hand from the (side of the) bridge. The longer end, or better, the rest of the hank of string should be held by the left hand. A good string makes two lines (which run) from one end to the other (of the string when plucked), and remember to tie the correct end of the string on the bridge. The string which makes three lines, which run from one end to the other (of the string) is still a very good one. Be always very careful to pair (the string) with another one of the same kind: if it makes three lines, pair it with another one which makes three lines; in this way (the two strings) will be in tune, and will not sound false. If, for instance, you cannot tune the 'sotane' or 'mezane', even if they are good, turn the end of the strings the other way around. For the already mentioned reasons you should then (be able to) tune them. In fact, with the thin strings, very often we cannot be sure which end is the thinner or the thicker one, to tie on the bridge, and for this reason we cannot tune it. If you turn the ends of a string the other way around, you will find that (the string) works better in one position than the other. // If, for instance, when you tie the string, you leave in front of the bridge one inch of false string you will not be able to tune it and the whole string is false. So, take off the string, pluck it again and try and check it. // If one of the 'mezane' or the 'sotane' is, by coincidence, thicker than the other, always put the thicker one uppermost. If you pair a false string with a good one, you will never be able to tune them, and you will just have two false strings. [...] In fact, the closer the fret is to the strings it makes the strings of the lute sound like those of the harp [I had to use this long sentence in order to translate the verb 'arpiza'] and the instrument sounds better.)

John Dowland's essay brings other perspectives to the agenda in Robert Dowland's *A Varietie of Lute-Lessons ...* (1610). He discusses how one may judge the physical quality of strings and how the performer must be well aware of this so as not to be cheated by the seller:

Ordinarily therefore wee choose *Lute-strings* by freshnesse, or new making: the which appeares unto us by their cleere and oylinesse, as they lye in the Boxe or

bundle; yet herein we are often deceived, for Oyle at any time will make strings looke cleere, and therefore this tricke is too too commonly used to them when they are old.

Now because Trebles are the principall strings wee neede to get, choose them of a faire and cleere whitish gray, or ash-color, and take one of the knots in your hand, but let it not be too small, for those give no sound, besides they will be either rotten for lacke of substance, or extreame false. Also open the bouts of one of the ends of the Knot, and then hold it up against the light, and looke that it be round and smooth: but if you discerne it to be curlie, as the thread of a curled Cypris, or horse hayre, (which you may as well feele as see) then refuse them, although they be both cleere and strong, because those strings were not well twisted, and therefore will never be true on the Instrument. For trying the strength of these strings, some doe set the top of their fore and middle finger on one of the ends of the Knot, which if they finde stiffe, they hould them then as good; but if it bend as wee say, through a dankish weakenesse, then they are not strong. Some againe doe take the end of the string between their teeth, and they plucke it, and thereby if it breake faseld at the end, then it is strong, but if it breake stubbed then it is weake. This Rule also is houlden for the breaking of a string betweene the hands. The best way, is to plucke out an end of the string (if the seller will siffer you, if hee will not affare your selfe that those strings which hee sheweth you are old or mingled,) and then looke for the cleernesse and faults before spoken, as also for faseling with little hayres. And againe looke amongst the bouts, at one end of the Knot, that the string be not parted, I meane one peece great and another small, then draw it hard betweene your hands, to try the strength, which done, hould it up againe against the light betweene your hands, and marke whether it be cleere as before; if it be not but looke muddie, as a browne thread, such strings are old, and have beene rubbed over with oyle to make them cleere. This choosing of strings is not alone for Trebles, but also for small and great Meanes: greater strings though they beould are better to be borne withall, so the colour be good, but if they be fresh and new they will be cleere against the light, though their colour be blackish. [...]<sup>18</sup>

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18 Dowland, J., 'Other Necessary Observations Belonging to the Lute,' in Robert Dowland, *Varietie of Lute-Lessons ...* (London, Thomas Adams, 1610): 12–18, 12.

*The Burwell Lute Tutor* (c.1670) informs us that the weather and climate are important for the quality of the string, and that the causes of bad, or false, strings include exposure to the elements, age and discolouration. We find concordance regarding the matter of the strings' clarity and that the two strings of each pair must be matched properly to have the instrument in tune. We are further enlightened that strings are best kept in oiled paper or in a hog's bladder to keep them from drying out, since gut is an organic material:

The good strings are made at Rome or about Rome and none that are good are made in any other place, except the great strings and octaves that are made at Lyons in France and nowhere else. They attribute that to the climate and to the waters. The strings are made of sheep's and cat's guts, and are twisted with a great deal of art. To be good they must be clear and transparent, smooth and well twisted, hard and strong; and new they are preserved in a white paper dipped in oil of almonds, or in a hog's bladder. They endure no moisture nor any excessive heat no more than the lute, but they will have a temperate air and place (but of the two the moisture is the worst). When they are open their goodness is known thus: holding the two ends in each hand and striking the string with the middle finger, if they part in two only; or if being laid upon the lute they do not jar. If the two strings can be made of one bunch they will agree the better; but it is hard to find two good strings of a length, therefore you must choose them as near as you can to the same bigness. The string must not be full of knots or gouty or rugged, nor be bigger in one place than in another. [...] You must then have always by you a pretty good store of good strings and be very exact in preserving them. You must put them to the lute with curiosity. Observe the bignesses of them and put no false ones; they become false several ways — if they be old, if they take air, if they be yellow, and (in one word) if they do not come from Rome.<sup>19</sup>

In *The Burwell Lute Tutor*, we also learn the reason (at least, according to this source) why Baroque lutes traditionally have, not only the first, but also the second course single-strung. Both the consistency of sound

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19 Dart, *Burwell*, 15–16.

during the performance of cadences and the tone quality of the second course itself are addressed:

The reason why we use but one second [[string]] is that the two seconds [[if combined to a single course]] will seldom agree, that the second of the two squeaking [doth] smother the other strings. Besides the cadence that is made upon the treble and the second is not so clear if there be two seconds.<sup>20</sup> (The [[ ]] signifies my own addition, not Dart's.)

Also agreeing with the main arguments presented here, Thomas Mace (1676) provides a lengthy discussion on where to find the best strings. His discussion of various sorts of strings stretches over several pages, but I am rather interested in a passage where he draws attention to the storage of strings, which concurs with *The Burwell Lute Tutor* with some additional details:

[...] they [i.e. the strings] may be very *Good* when you *buy them*, but *spoiled* in a *quarter of an hours time*, if they take *any wet*, or *moist Air*. Therefore your best way is, to *wrap them up close*, either in an *Oyl'd Paper*, a *Bladder*, or a *piece of Scar-cloath*, such as often comes over with *Them*, which you may (haply) *procure*, of them who sell your *Strings*: [...]

Which, when you have thus done, keep them in *some close Box*, or *Cupboard*; but not amongst *Linen*, (for that gives *moisture*;) and let them be in a *Room* where there is, or useth to be, a *Fire often*: And when at any time you *open them* for your *Use*, take heed, they lye not *too long open*, nor in a *dark Window*, or *moist place*: For *moisture* is the *worst Enemy* to your *Strings*.

Forget not, to *Tye*, or *bind them close*, or *hard together*.<sup>21</sup>

What we learn from the historical sources is that strings are not just strings. Choosing the right strings for the right occasion and maintaining them properly according to the selected material (an idea which applies to any material from any period of time), are crucial not only for a good tone, but also for keeping the strings in tune. Indeed, it is noticeable when playing with gut strings, at least in my experience, that after a while they

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<sup>20</sup> Dart, *Burwell*, 17.

<sup>21</sup> Mace, *Monument*, 66–67.

become impossible to tune well. They may be fairly much in tune based on open strings but become ‘false’ in higher registers, and I have made similar observations using other materials as well, although not always equally as obvious. Today’s strings, nonetheless, are different from what was used then, for reasons already stated, so the natural progression of this argument must therefore lead us to modern practices, to see how they relate to the historical sources.

## A few notes on modern strings

Luthier Martin Shepherd (2017) describes how attempts at manufacturing historically-informed strings are still in their infancy. Nylon strings ruled the early years of the twentieth-century lute revival, utilising plain nylon for the trebles and silver wound with a nylon floss core for the basses. For obvious reasons, nylon produces quite a different sound than gut, which is probably the reason that those interested in lute instruments delved into gut-string manufacturing as more original sources were unveiled and made available. As many lutenists in the early stages of the revival were trained Classical guitarists, which is often the case today as well, it is worth noting that lute courses were often strung in unisons. This may have had to do with the lack of available historical sources at the time, as well as the octave stringing being an undiscovered, traditional novelty that may have sounded strange to many Classical guitarists.<sup>22</sup> Today, however, we seem to use gut strings as a starting point for what lute sound really is, and indeed it is an interesting process, reaching beyond synthetic factory production. Luthier and string manufacturer Daniel Larson (2017) describes the process of making gut strings, in which an animal is first slaughtered to provide the guts which are then sorted and prepared for manufacturing. Following this, the strings are processed and twisted before they are left to dry and ultimately polished. At this stage, the strings can be left as they are or they can be processed further into wound strings.<sup>23</sup>

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22 Shepherd, M., *Lute Strings: Ancient and Modern*. Retrieved 12 June 2017, URL: <http://luteshop.co.uk/articles/stringing/>.

23 Larson, *Making*.

It seems that the wound strings receive the most attention from modern string manufacturers. Mimmo Peruffo (2008) points out a difficulty for modern string manufacturers, which is the transition from one string type to another (e.g. nylgut treble to silver wound in the basses, or any other combination) and as a result, the middle register is particularly difficult to solve. There are also difficulties related to octave courses where often a non-wound and a wound string are placed together to form one single course. Modern synthetic stringing has not yet been able to develop an appropriate string type for the mid-register; one possible approach to the issue, as Peruffo suggests, is to use aluminium wound strings and carbon strings to smooth the transition. He comments, ‘The string maker has very limited leeway indeed: putting together a good set of gut strings for the lute looks more like a tricky narrow path than a wide and easy highway.’<sup>24</sup> In this respect, it is interesting to note Peruffo’s employers, the string manufacturer Aquila’s list of the differences between old and new wound strings. They identify three sorts of wound strings used in the late seventeenth century to the nineteenth century, including:

- 1) *Close Wound*: the single wire spires are tightly wound touching one another. It is the still commonly used sort.
- 2) *Double Wound*: a second close wound layer is laid over the first one. Because of the large quantity of metal wound on the gut core they were employed on instruments with a short string length but requiring a low tuning, e.g. violoncello da spalla, 5th double bass string &c.
- 3) *Open wound* (demifilè): the single wire was wound so that the spires would not touch one another but with a space in-between equal or slightly wider than the wire diameter (see Françoise Le Cocq, Paris 1724); these strings were in use exclusively in the in 18th century as [a] transition between plain gut mid-register and close wound basses, e.g. Bass viol 4th, violin 3rd &c and D minor german [sic]

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<sup>24</sup> Peruffo, M., *The Lute in its Historical Reality*. Retrieved 12 June 2017, URL: <http://ricerche.aquila-corde.com/wp-content/uploads/liuto-en.pdf>, 99.

baroque Lutes.<sup>25</sup> (Italic emphasis added; in the original, bold typeface was used)

These three types identify interesting developments, where the close wound seems to have been the general *modus operandi*, the double wound accommodated low register and short string length, and the open wound sought to address the middle-range problem from the eighteenth century on. The latter string type will not be treated specifically, since the scope of this book only stretches to the end of the seventeenth century, but it does acknowledge that the middle register was indeed a problem before that; otherwise it would not have been invented. Furthermore, there have to be differences between historical and modern strings, both because of the differing conditions in which the strings were and are made, and because modern string makers must use their own experience and expertise to fill in the gaps where historical evidence is scarce. According to Aquila (2017), in this case focusing on the highly-related violin strings, the historical wound strings present the following features:

- a) medium or high twist gut core.
- b) round metal wire winding.
- c) no silk ‘padding’ between core and metal winding.
- d) metal wire of silver, silvered copper, pure copper or its alloys (brass).
- e) different gut/wire ratio than the modern wound strings.

While the modern equivalents are characterised by:

- a) flat metal winding.
- b) stiff, low twist core.
- c) silk ‘padding’ between core and metal winding.
- d) employment of modern alloys like tungsten, nickel, &c.
- e) metal-biased gut/wire ratio.

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25 Aquila Corde Armoniche, *Aquila Bow Wound Strings: Our Criterias*. Retrieved 12 June 2017, URL: <http://ricerche.aquilacorde.com/i-nostri-lavori/98/corde-rivestite-per-archi-i-nostri-criteri/>.



Hence the acoustical differences are quite noticeable and interest [sic] both dynamic and timbric aspects.<sup>26</sup>

This example demonstrates both that historical and modern strings seem to be different, but also that there is a need for them to be different. Given the conditions in which they are made, as well as the modern sense of what a good tone is, which is still highly related to much later musical practices, a simple remake would not be preferable today. This is further supported by the fact that we cannot know for sure all the necessary details from reading primary and secondary sources, nor the exact, original conditions of the very old, preserved strings which have been subject to the test of time.

Martin Shepherd also addresses the mid-range problem when he draws attention to the matter of dimension and elasticity. As strings become thicker the lower the pitch is, to preserve a suitable working tension, they also become less elastic and the sound becomes more and more short-lived and out of tune. He gives an example: ‘The sixth course of a lute is two octaves below the first course, and even when strung at a much lower tension still has to be about 3–4 times thicker. This increase in thickness as you go down into the bass creates a problem [...]’ One measure to address this issue is to put more twist in the string during production, but that only provides sufficient effect to a small degree, about which scholars, luthiers, performers and string makers disagree. Some have experimented (and continue to do so) with loading the gut strings with metallic salts to double the density of unloaded gut strings. Although certain historical paintings suggest the use of this method through the colour of the strings, it is less certain whether the literature concurs. Loaded strings would cause them to become, for instance, a reddish colour, while Mace et al. above emphasises that the strings should be clear. Yet, because the holes on the bridge through which the strings are attached are not bigger than they are on surviving instruments, the loaded gut string concept presents itself as a plausible theory. Otherwise, the strings would either be too big to fit the holes,

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<sup>26</sup> Aquila, *Wound Strings*.

or the tension would be as low as half of what is accepted nowadays as common-sense practice. The pitch can, of course, be set higher in general, but then we will meet problems with the first course suddenly becoming too thin, and the differences in the bass-string diameter are still not large enough.<sup>27</sup> It is apparent that string making and string selection are complex matters. Indeed, they could have filled a full chapter on their own. They are part of a constant flux between historical conditions (as perceived by the interpreter), modern academic and practical expectations, professional and non-professional ideas of good sound, research combined with trial and error, and simple physics and deductive-constructive methodologies. This is further exemplified by surviving instruments and strings. The idea of choosing, preferring or designing modern ‘historical’ strings is thus not only about the strings themselves, but also about forming an idea of what function they should or could perform, and what is to be expected from them. Furthermore, it is difficult to compare the sonic quality between various types of strings. Trial and error by individual players is time consuming and expensive, and memory and preconceptions make it difficult to compare strings from memory which may have been tested several months apart. I would, here, very much have liked to be able to offer the reader enlightening charts comparing the sonic qualities (frequencies) and tone development over time (e.g. attack and decay) of the different types of strings available in all their various twists, loadings and varnishing. Such an investigation, however, would demand scientific-quality tools and laboratories which I do not at the time of writing have access to, and as such, I must postpone such ambitions for future research projects.

Moving on, beyond the level of understanding the strings themselves, we also find their internal relationship; that is, how they are matched and tuned together — their temperament.<sup>28</sup>

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27 Shepherd, *Lute Strings*.

28 Further reading on the luthier-related topics presented so far in this chapter includes: Bachorik, J.E., *Lute Making: A Survey of Historical and Modern Construction* (USA: self-published, 1974); and Taylor, R.Z., *Make and Play the Lute* (Chichester: Argus Books Ltd., 1983).

## Temperaments, tension and sustain

Temperament, that is, how we tune instruments and intonate tones according to various principles and traditions, is a vast subject and any attempt to fully cover the topic in this context would seem somewhat unrealistic and unnecessary. Yet, temperament is crucial to tone production because it decides how multiple tones performed simultaneously and in relation to neighbouring tones and harmonies are both perceived and how their tone develops over time. In fact, much of an instrument's sustain, tension and richness of overtones are decided by its temperament.

Temperaments can be seen in two ways. The first is when playing monophonic music where we have more freedom in choosing temperament. Because we only consider the tonality horizontally, there are fewer consequences for the overall tonality. Local adjustments can be made within a set tuning by either moving the frets or changing the pitch by pulling or slacking the string with the finger. In polyphonic music, however, the selected temperament produces greater consequences because it has to function vertically over a period of time. This is one of the main reasons why the repertoire of certain instruments historically is often based on a few selected keys in close relation.

Set aside from historical points of arguments, traditions and various ideologies of aesthetics, the selected temperament relates directly to sustain and resonance. A good example here is Pythagorean tuning versus modern Western equal temperament. Western equal temperament divides every semitone into 100 cents, making it easy to calculate (1 semitone or 1 fret on a guitar =  $1 \times 100 = 100$ ; 5 semitones or 5 frets on a guitar =  $5 \times 100 = 500$ ). Pythagorean tuning, however, is strictly mathematical and based on the natural proportions of harmonics. If a string is represented by one whole, that is the full length of the string, we find the first harmonic ( $f_1$ ) at the half of it (Pythagorean ratio 2:1), the second ( $f_2$ ) by dividing the string into three parts (3:2), the third ( $f_3$ ) by dividing the string into four parts (4:3), etc. (see Table 4.3 below). They are reached by multiplying the fundamental frequency by whole numbers.

**Table 4.3.** Overview of a fundamental pitch and its first seven overtones.

Order	Example pitch of a = 440 Hz	Multiplication	Relative interval from preceding tone
$f_0$	440 Hz	$f_0 \times 1$	(unison)
$f_1$	880 Hz	$f_0 \times 2$	octave
$f_2$	1320 Hz	$f_0 \times 3$	fifth
$f_3$	1760 Hz	$f_0 \times 4$	fourth
$f_4$	2200 Hz	$f_0 \times 5$	major third
$f_5$	2640 Hz	$f_0 \times 6$	minor third
$f_6$	3080 Hz	$f_0 \times 7$	subminor third
$f_7$	3520 Hz	$f_0 \times 8$	supermajor second

By choosing to play in Pythagorean tuning, we have the major benefit of an increased sustain, because the overtones of the string and the instrument align better, in theory, with the temperament. This is conditional upon the luthier properly matching the materials and components of the instrument (consider earlier discussion of the mass-spring system and lute sound as the sum of its components). In Table 4.4 below, we see how different Pythagorean temperament is from Western equal temperament. They both have the octave at 1200 cents, but otherwise they differ from 1.96 to an astonishing 11.73 cents.

**Table 4.4.** Comparison between Pythagorean and Western equal temperaments.

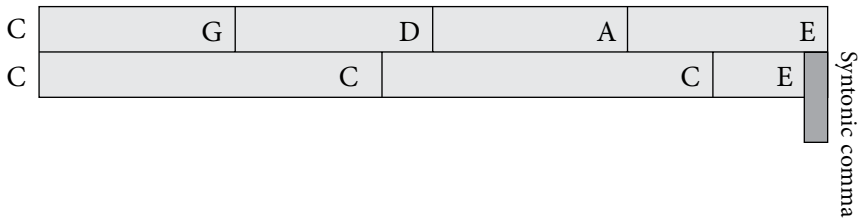
Semitones	Pythagorean (in cents)	Western equal temperament (in cents)	Difference (in cents)
1	90.22	100	9.78
2	203.91	200	3.91
3	294.13	300	5.87
4	407.82	400	7.82
5	498.04	500	1.96
6	Aug. fourth: 611.73 dim. Fifth: 588.27	600	11.73 11.73
7	701.96	700	1.96
8	792.18	800	7.82
9	905.87	900	5.87
10	996.09	1000	3.91
11	1109.78	1100	9.78
12	1200	1200	0

The crucial relationship here can be found between the fifth and the thirds. If we were to stack five pure fifths on top of each other from a reference note, such as 'C', we would reach an 'E'. Compared to similarly stacking two octaves and a pure third above each other, we would still go from 'C' to 'E', but the pitch would be different. At a time when the scientific measuring tools we have today were unavailable, this difference was used as a subjective measuring reference and we call it a *syntonic comma*. (See Fig. 4.5 below).<sup>29</sup> In the first system with the fifths stacked upon each other, we ensure that the fifths are pure according to Pythagorean principles, but the thirds are very much 'out of tune.' In the second system, however, where we stack two octaves and a pure third on top of each other, the thirds are pure, but the fifths are far too low. Put simply, these two principles mark the two core perspectives on temperament and tuning, even counterpoint, through the ages. In the Medieval period, harmony was not an issue and there was preference for pure unisons, fourths, fifths and octaves, which left the thirds to be considered as imperfect consonances and they were left out of important musical situations, such as the final chord of a musical work. This is understandable in a system promoting intervals based on natural harmonics, since the major thirds were indeed  $1/5$  of a semitone larger than the pure third, and the minor third was  $1/5$  of a semitone smaller than its pure relative. Not until the sixteenth century did the major third become an established part of the cadence (i.e. the *Picardy third*).<sup>30</sup> When the Renaissance period began, the fifths lost their favour to the pure thirds to better enable harmonies, but this came at the cost of leaving the fifths 'out of tune.' Various systems were created following this, in which the fifths were compromised at various degrees to accommodate harmonic progressions and modulations. The 'meantone system', or  $1/4$  comma system of tuning, lowered the fifths by  $1/4$  of the syntonic comma. This tuning sounds very nice on an instrument, but the harmonic restrictions are great indeed. As Rolf Lislevand pointed out to

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29 Early Music Sources, 'Just Intonation,' YouTube video, 14'10", posted by 'Early Music Sources,' 6 October 2016, URL: [https://www.youtube.com/watch?v=XhY\\_7LT8eTw&feature=youtu.be](https://www.youtube.com/watch?v=XhY_7LT8eTw&feature=youtu.be).

30 Drabkin, W., 'Third,' *Grove Music Online*. *Oxford Music Online*, Oxford University Press. Retrieved 29 May 2017, URL: <http://www.oxfordmusiconline.com/subscriber/article/grove/music/27849>.



**Figure 4.5.** The syntonic comma. Adapted from *Early Music Sources* with permission.

me once during a private discussion, the fifth alone sounds awkward, but when the third is added it largely cancels out the fifth, making the harmony work much better. When the composers and musicians later asked for more distant harmonies, tuning had to be adjusted accordingly and a range of new temperaments arose, including  $1/5$  comma,  $1/6$  comma and  $2/7$  comma, etc. Indeed, the variations, or rather different compromises between fifths and thirds, are plentiful. In more recent years, Western equal temperament has tried to level out these differences (see Fig. 4.6 below) to enable musicians and composers to move freely between all possible keys, but the compromise is great indeed, and both fifths and thirds are out of tune according to natural harmonics. The positive effects of this are that they make a wider range of keys possible, and the composer and performer can explore distant keys within the same musical piece that are not closely related at all. The disadvantage of this, however, is that the intervals no longer align properly with the instrument's and strings' natural physics, making the tone duller with a shorter sustain.

700	700	700	700
1200	1200	400	

**Figure 4.6.** The case of Figure 4.5 expressed in Western Equal Temperament. The intervals are expressed in cents.

What we can learn from this development, in order to understand tone production conceptually, is that tuning has no right or wrong configuration. It is dependent on personal preference, and historical and cultural contexts. Moving outside Western society, we find clear examples of more complex temperaments in the Far East, the Orient and Asia, and for anyone trying to learn Turkish music, for instance, one soon realises the

challenges of intonating when an octave is divided into 53 commas. A conceptual understanding of tuning and temperament is, then, also a matter of cultural understanding and ear training according to that specific culture. When further considering the matter of sustain and resonance, we understand that culture is also a part of the instrument's resonance and temperament. Instruments that seem to have been performed in more resonant acoustics seem to have had a stronger attack and shorter sustain, making them sound clear in large halls or their equivalent. Instruments that seem to have been utilised mostly in dry spaces, including several folk instruments such as the Norwegian Hardanger fiddle, the keyed fiddle and the hurdy gurdy, had the resonance built into the instrument by utilising sympathetic strings. Modern plucked instruments also have a much higher string tension and thicker materials which, together with shortened sustain and less apparent activation of unaligned overtones, makes them duller and often louder (depending on the performer) than their historically-distant counterparts.

## Practical considerations for lute instruments

Temperament, however, is not all that affects sustain, resonance and tone production. It is also important to include performance technique and instrument set-up when developing a concept for tone production. Regarding the left hand, the point at which one places one's fingers between two frets actually makes a difference. If the fingers are placed off centre, it can be difficult to press the string all the way down on the fretboard, which in turn affects the string's movement. This can result in shorter sustain and slightly-altered pitch, especially when the distance between the fretboard and the string is high (see Fig. 4.7 below). When placing the finger at the centre between two frets, it is easier to press the string down properly and reach full string tension (see Fig. 4.8 below). A good experiment to illustrate this, at least in my experience, is to play a D minor chord on a Baroque guitar, first with the fingers unevenly placed and then with all the fingers in the dead centre of each fret. What I notice is that the first case results in an unbalanced chord that sounds slightly out of tune, while the second case produces a well-balanced chord where all tones have similar sustain and are perceived as more in tune with each other. What is interesting to



**Figure 4.7.** Off centre: The strings have no contact with the fretboard, resulting in ineffective string vibrations and sometimes loss of sustain and altered pitch. Photo: Robin Rolffhamre.



**Figure 4.8.** At the centre: The strings have contact with the fretboard, resulting in effective string vibrations. Photo: Robin Rolffhamre.

note here is that I have found no primary sources, neither past nor present literature, which supports or even mentions this, except for Rolf Lislevand, who once raised the issue with me during a private conversation.



This is not necessarily true on all instruments. I have made observations that, in addition to modern Classical guitars and their relatives, the steel string instruments of old are less determined by the centre position. On my own *chitarra battente*, the difference between on and off centre is so minimal that I wonder if it is even perceptible. It is worth noting that John Playford (1666), in writing about the metal-strung cittern, says that '[...] To strive to stop clear; Which to do, be sure not to stop short of the Fret, not just upon it, but with the end of the finger as near the Fret as you can, and the harder the better.'<sup>31</sup>

Beyond the placing of the left-hand fingers, old frets cause various problems as well. First of all, they can become dry and loose, making them move around uncontrollably when the left hand moves up and down the fretboard. Secondly, when fibres break and the frets get rough and 'hairy,' the frets make unwanted contact with the vibrating string, causing noise as they disturb the trajectory of the string. Finally, unevenly-worn frets cause uneven heights, which in turn produce uneven tensions between strings, also affecting intonation and sustain; this means that a perfectly-tuned instrument, with all the frets correctly positioned, may still be out of tune because it has old frets (see Fig. 4.9 below). According to *The Burwell Lute Tutor*, 'The frets must be good and new, and tied very fast; [...] Now one cannot well tune his lute unless it be well strung and have good frets.'<sup>32</sup> Furthermore, Mace advises us to use single frets rather than some techniques of tying which result in double frets, as they produce a clearer tone. In Mace's words, double frets 'cannot be thought to *speak so Clear*, because, although it *Lye hard and close*, upon the *uppermost* of the *Two*, next the *Finger*, yet it cannot lye so very *close and hard*, upon the *undermost*; so that it must needs *Fuzz* a little, though not *easily discern'd*, and thereby, takes *off* something of *Its Clearness* [...].'<sup>33</sup>

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31 Playford, *Cithren*, Brief Instructions to Playing the Cithren (7th page).

32 Dart, *Burwell*, 15–16.

33 Mace, *Monument*, 70.



**Figure 4.9.** The frets are so worn out that they affect the sound by being too low. Small fragments sticking out also disturb the string's vibration. Photo: Robin Rolfhamre.

## Performing in an acoustical space

Although there are several matters contributing to how a lute instrument performs physically, it has to be said that most of them take place during the construction of an instrument. Except for matters concerning humidity, geography and temperature, there is little one can do about the construction of a finished instrument other than make physical alterations to it, or to buy another instrument. It is indeed relevant to understand how the instrument behaves and why, in order to understand how sound develops in a certain context, but what is even more important for the practicing performer is to understand how it is affected by, and behaves, in an acoustical space. As mentioned earlier in this chapter, understanding a single particle's behaviour is simple enough, but when a multitude of particles are considered in relation to each other it all becomes highly complex.

A large portion of what shapes the sound of a lute in an acoustical space has to do with reflection. When sound impacts with a surface at a certain angle it will reflect at a corresponding angle. This means that if sound

approaches a wall from an angle of  $22^\circ$  from the left, it will project from the surface at an angle of  $22^\circ$  to the right. But not all sound is reflected. All materials absorb sound to various degrees, some more than others, which means that some sound is not reflected, but passes through the surface into the material. Painted concrete, for instance, absorbs around 10% at 125 Hz and 7% at 1000 Hz, while ordinary window glass absorbs around 35% at 125 Hz and 12% at 1000 Hz, leaving painted concrete as the most reflective material of the two.<sup>34</sup> But it is not as simple as that, because the absorption qualities of a material alter in relation to humidity as well. All materials have air pockets, to various degrees, depending on their density. When humidity increases, the surface's air pockets fill with water, making the material less absorbent and more reflective. Conversely, dryer spaces mean less reflection and reverberation.

*The Burwell Lute Tutor* reveals some traces of contemporary acoustics, 'You do well to play in a wainscot room where there is no furniture, if you can; let not the company exceed the number three or four, for the noise of a mouse is a hindrance to that music.'<sup>35</sup> In a later comment we also learn that:

the lute is a closet instrument that will suffer the company of but few hearers, and such as have a delicate ear; for the pearls are not to be cast before the swine. As I answered once to a gentlewoman that told me the lute was a heavy music: I answered that her ear was heavy, and that a violin was most fit for her [...] for the cabinet rather than for a public place.<sup>36</sup>

This was quite a rude remark, comparing the noblewoman to 'the swine'; particularly when considering Leppert's argument that the violin was a popular instrument for the lower classes in the seventeenth century, 'who used it principally to accompany dances.'<sup>37</sup> Indeed, in *The Burwell Lute Tutor* we read: 'To make people dance with the lute it is improper.'<sup>38</sup>

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34 Everest, F.A., and Pohlmann, K.C., *Master Handbook of Acoustics*, fifth edition (USA: McGraw Hill, 2009), 481.

35 Dart, *Burwell*, 45.

36 Dart, *Burwell*, 60–61.

37 Leppert, *The Sight*, 34.

38 Dart, *Burwell*, 62.

Thomas Mace (1676) also speaks of acoustics and presents a sketch of a ‘*Most Excellent Musick Room*’ which he comments accordingly:

The *1st Thing* to be consider’d, as to the *Advantage of Good Musick*, should be a Convenient, and Fit *Place* to perform It in; such I would call a *Musick Room*; and is considerable in a *4 Fold Respect*, *1st.* in *Respect* of, the *Instruments*, *2d.* the *Musick*, *3d.* the *Actors*, and *4th* the *Auditors*. [...]

Again; tis observable, That all *Persons* who pursue *Musick*, do endeavour to procure the *Best Instruments* that can be gotten. Now let the *Instruments* be what they will, a *Good Room* will make Them seem *Better*, and a *Bad Room*, *Worse*, as I said before: Therefore It is of a *Great Concern*, to have a *Room*, which may at least, *Advantage your Instruments*, if no other *Conveniency* were gain’d thereby. [...]

Here, Mace touches upon one of the core arguments of this book as he speaks of a *music* room that functions as a relation between the instrument, music, performer and perceiver (in this case, the audience). He continues to emphasise that the quality of sound demands both a good, level instrument and good acoustics, and that they are properly contextualised by the performer to have the room emphasise the best qualities of the instrument; that is, the performer must take the acoustics into consideration to achieve the best tone quality. Mace continues to present, what he perceives to be, the most-suitable music room:

The *Room* would be *One Step Higher*, than the *Galleries*, in the *Floor*; the better to conveigh the *Sound* to the *Auditors*.

The *Height* of the *Room* not too *High*, for the same *Reason*.

[...]

The *Room* being *Thus Clear*, and *Free from Company*, all *Inconveniencies* of *Talking*, *Crowding*, *Sweating*, and *Blustering*, &c. are taken away.

*2d.* The *Sound* has Its *Free*, and *Un-interrupted Passage*, &c.

*3d.* The *Performers* are no ways *Hindered*, &c.

*4th.* The *Instruments* will stand more steadily in *Tune* [...].

*5thly*, The *Musick* will be *Equal* to all alike.<sup>39</sup>

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39 Mace, *Monument*, 238–240.

Note how Mace presents perspectives similar to those of Rogers, such as having a small audience and giving sound an uninterrupted, free passage. Mace goes further, however, commenting on how the acoustical space affects tuning and that a proper space for music does not differentiate the tone qualities among the auditors; it is perceived alike by all. Mace's argument here is somewhat different than mine in the sense that Mace speaks of constructing a space for music, while I am concerned with tone production in an already-existing space, be it perceived as good or bad. But what we can draw from his discussion is the aim of controlling tone quality and musical expression, to the extent that the musicians are not hindered, neither by instruments and acoustics, nor audiences, in their mediation. Mace's passage on acoustics is quite extensive compared to other topics discussed in *Musick's Monument*, and he proceeds to describe more and more intricate solutions to the interior design, such as 'by Groves, or Pipes, to certain Auditors Seats, where (as they sit) they may, at *small Passage*, or *little Hole*, receive that *Pent-up-Sound*'.<sup>40</sup> Rogers and Mace are, of course, only two sources (both from England) and they do not alone represent the full perspective of the ideology of acoustics in Early Modern times. What they do is to give us an important indicator of the Early Modern musician's consciousness of acoustics as an important part of music performance. Continuing along Mace's line of argument, focusing on the sentence 'The *Musick* will be *Equal* to all alike,' we cannot proceed without addressing the issue of phase and comb filtering, because this has a great deal to do with how we perceive a tone. If sound is propagated hemispherically, it means that sound will impact with different surfaces at different times, reaching the ears of the listener at various temporal locations. This is also what makes an instrument sound different in diverse acoustical spaces, because sound as a design is perceived in relation to the space in which it is being created. Phase and comb filtering are important matters in this regard, as they explain why this is happening. The speed of sound is often said to be around 344 metres per second, but in reality, it depends on the temperature, following the formula  $331.4 + (0.607 * T)$  where T is

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<sup>40</sup> Mace, *Monument*, 240.

temperature in Celsius.<sup>41</sup> If the temperature is 22°C, sound travels at a speed of 344.6 metres per second, but if the temperature is 5°C, its speed is reduced to 334.4 metres per second. If we have two identical sounds played at the same time, the amplitude (i.e. the force at which the particles are displaced) is doubled; if we invert the phase of one of the identical sounds (i.e. turn it up-side-down), we hear nothing because the positive amplitude of one sound is cancelled out by the equally-large negative amplitude making the matter particles stand still, *ergo*, no sound (if two people pull an object in opposite directions with equal force, the object will not move, as the forces cancel each other out); however, if the one sound is slightly displaced relative to the other, some frequencies are amplified and some are cancelled out (on a spectrogram this would look like a comb). This is called comb filtering and this is what makes a certain tone sound the way it does.

As sound is propagating and reflecting inside a room, some sound is obliged to fit the room's dimension in such a manner and angle that it bounces back and forth between two fixed points. This causes some frequencies to become amplified and some to be attenuated or even cancelled, according to the principles of phase and comb filtering mentioned above. Such behaviour gives rise to a phenomenon called *room modes*. All rooms have preferred frequencies, that is, tones that are reinforced by the room and perceived as stronger sounding than other tones. This also happens inside instruments, which we may consider as very small rooms. I recently had the good fortune to perform two Italian, traditional tarantellas with a talented violinist in Sweden; the first was in G major and the second in A minor. What we observed was that the violin reacted very differently to the two keys, and the violinist told me that in the A minor tarantella, the instrument produced the tone by itself in a sense, while in the G major tarantella, she had to 'do all the work' herself. This is a typical and clear example of how the room modes unveil themselves through an instrument.

Room modes are not only an indicator of what sounds subjectively good or bad in a room, or what frequencies are strengthened or weakened,

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41 Rayburn, R.A., *Eargle's Microphone Book: From Mono to Stereo to Surround. A Guide to Microphone Design and Application*, 3rd ed. (USA: Focal Press, 2013), 11.

but they can also be used in reverse engineering. In an interesting study by Hassan Azad, attempts are made to recreate historical acoustics to learn more about how music could have sounded. Azad studies the music room of the Safavid palace, Ali Qapu in Isfahan, Iran, and finds that it has quite intimate acoustics despite its large construction (see Fig. 4.10 below). From this we learn that large spaces and intimate acoustics are not necessarily opposites:

The reverberation time was nearly low in all configurations. This means that Ali Qapu has been so suitable for intimate music especially Iranian ballad which is a part of Iranian traditional music performed in that era. [...] In spite of high proportion of the room volume to the audience between 8 to 10<sup>3</sup> per person, the presence of cut-outs brought about low reverberation time to serve the function of the room as a host for speech and intimate music.<sup>42</sup>



**Figure 4.10.** Music Room. The acoustic ceiling of the rooftop music room of the Ali Qapu Palace in Isfahan, Iran. Photo: David Stanley. Published on Flickr under a Creative Commons Attribution 2.0 Generic license (CC BY 2.0); some rights reserved. Original photograph in colour.

42 Azad, H., 'Ali Qapu: Persian Historical Music Room.' *Proceedings of the Institute of Acoustics*, 30 (2008) Pt.3., 4.

In this chapter, we have moved from the instrument-centric to the external and we have now reached a point where the musical instrument takes part in an acoustical environment. Tone production, both seen as a physical, theoretical phenomenon and as a concept, has now become part of an external space and so we must also consider how we as performers and audience members relate to tone production from psychological perspectives. The following chapter will introduce some key perspectives, mainly from social psychology, from which we can contextualise the historical texts (Chapter 2), the modern interpreter instructions (Chapter 3) and the physics of tone production (Chapter 4), to reach a better understanding of how we subjectively and socially form our own concept of proper tone production.





## CHAPTER 5

# To whom it may concern

*‘It’s not the situation ... It’s your reaction to the situation.’*

—Robert Conklin

After reviewing issues related to historical evidence, collegial influence and how an instrument performs and constructs its sound, it is now time to relate them to the core of musical experience — humans. Psychology, naturally, is a very extensive, time-consuming subject and concept to treat. My focus will be dedicated to the concept of tone production as a means of self-expression, within a social-psychological framework. The reason for choosing these two disciplines, among all available psychological perspectives, is because they both contribute pragmatic and easily-grasped concepts on how we relate to each other. Both provide perspectives that, without having formal degrees in psychology, can put tone production into other contexts than the traditional, historical-to-present translation of musical sources. ‘Self-expression’ places tone production into a context emphasising the personality inherent in tone construction, i.e. how a tone is not only produced to sound ‘good’ (regardless of whom it is intended to sound ‘good’ for), but how it can also be part of producing an idiolectic sound quality, one that people recognise as a specific artist’s sound. In a book treating how we can conceptually understand tone production, this is an important part of the argument. When channelling our knowledge of a historical and artistic practice to an audience, we are bound to put some of ourselves into it, as we become the medium in which the concept of tone production is mediated and realised. Social psychology, in my view, functions as a kind of meta-science, relating a vast majority of disciplines (e.g. neurology, behaviourism and applied psychology) to direct attention to human behaviour as a directly social

activity, which also makes it apt to apply to studies outside of Psychological Studies without much effort. The chapter is organised from a broad perspective working its way towards a more focused one.

## Embodiment

Several studies treat musical texts by discussing and analysing ornamentation, interpretation and tablatures,<sup>1</sup> but what most of these studies fail to consider is the performer's physicality as a framework for how tone production is constituted and how it functions as a framework of the self. Speaking as an active musician myself, the way we play and the way our physiognomy is constructed affect our technical limitations when performing music; a strong tension in the body certainly provides technical restrictions that make us perform less well than our potential would suggest. The physical construct of the musician also becomes part of a relation between the aural and visual, where musician and music merges into one signifier that is perceived by an audience. As such, it becomes evident that when speaking of tone production, we must also consider the physical, as well as the sonic, aspects of technical performance as something being perceived. To do this, it is necessary to discuss how the body relates to the performer. Researchers who have studied embodied social cognition (or simply embodiment) present a well-founded body of knowledge that supports the idea that bodily states actually influence social perception, attitudes and emotion.<sup>2</sup> Dona R. Carney, Amy J.C. Cuddy and Andy J. Yap, for example, have studied the relationship between body posture and our bodies' neuroendocrine system. They draw attention to several studies proposing that facial expressions can affect emotional states. 'For example, unobtrusive contraction of the "smile muscle" (i.e., the zygo-

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1 Such as: Rave, W., *Some Manuscripts of French Lute Music 1630–1700: An Introductory Study*, PhD (USA: University of Illinois at Urbana-Champaign, 1972); Rave, W., 'Performance Instructions for Seventeenth-century French Lute Repertory,' in V.A. Coelho (Ed.), *Performance on Lute, Guitar and Vihuela* (USA: Cambridge University Press, 1997): 142–157; Torres, G., 'Some Manifestations of French Lyricism in Seventeenth-Century Pièces de Luth Repertoire,' *Journal of the Lute Society of America*, XXX (1997): 25–41; Torres, G., 'Performance Practice Technique for the Baroque Lute: An Examination of the Introductory Avertissements from Seventeenth-Century Sources,' *Journal of the Lute Society of America*, XXXVI (2003): 19–47.

2 Sutton, R., and Douglas, K., *Social Psychology* (China: Palgrave MacMillian, 2013), 194.

maticus major) increases enjoyment [...], the head tilting upward induces pride [...], and hunched postures (as opposed to upright postures) elicit more depressed feelings [...].<sup>3</sup> In their paper, ‘Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance’ (2010), they ask if physical displays generate a feeling of power to the same extent as a feeling of power generates physical displays. Carney et. al. found that by standing or sitting in an authoritative, dominant posture, there were measurable differences in hormone levels compared to subjects sitting in submissive positions; in authoritative cases, testosterone levels (what Carney et al. call the ‘dominance hormone’) increased and cortisol levels (‘the stress hormone’) decreased, and in subjects who were instructed to take submissive postures, the testosterone and cortisol levels were inverted.<sup>4</sup> Other studies following this one propose that the positive effect of testosterone and cortisol levels in authoritative stances also has positive outcomes afterwards, when the subject is not in an authoritative posture any longer.<sup>5</sup> This is particularly interesting when considering the shift in bodily posture seen in visual representation of lute players presented in Chapter 2 (cf. Graphs 2.7 and 2.8). Moving from a closed-centred posture in the Renaissance to an open seventeenth-century posture, to a centred eighteenth-century posture, we can then add a psychological dimension to the works of art and how they are constructed to be perceived. Especially when taking Leppert’s argument that visual arts are a source of *seeing* sound into account, we can draw the conclusion that the visual representation of body posture and the concept of tone production are indeed related. Drawing on the work of Cuddy and her colleagues, it is possible to say that a visual work of art represents something to be perceived by an audience, in which we can witness actions leading to hormone activity (put simply), that in turn says something about the action

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3 Carney, D.R., Cuddy, A.J.C., and Yap, A.J., ‘Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance.’ *Psychological Science*, 21 (2010): 1363–1368, 1364.

4 Carney, *Power Posing*.

5 Cuddy, A.J.C., Wilmuth, C.A., and Carney, D.R., ‘The Benefit of Power Posing Before a High-Stakes Social Evaluation,’ *Harvard Business School Working Paper* (13–027, September, 2012); and Cuddy, A.J.C., Wilmuth, C.A., and Carney, D.R., ‘Preparatory Power Posing Affects Performance and Outcomes in Social Evaluations.’ *Harvard Business School Working Paper* (13–027, November, 2012).

being performed. If the performer is affected by the posture, that will in turn affect their performance and ultimately their tone production. In my experience as an active performer of lute instruments, I find this to be true. This is one of those precious moments in the intersection of traditional musicology and artistic research where practice and professional experience can contribute something that is difficult to put down in writing. Quantitative and qualitative studies are indeed possible to perform, but in this particular case I do not think it is necessary in order to present my argument. In fact, I do not find it necessary even to separate between the actual results of hormone production and possible placebo effects, because no matter what we experience, real or not, physical or mental, it is part of our perception of a given situation and our understanding of our self in a musical context. The posture affects our attitude towards our own (and other's) tone production. This is supported by research. Jens Förster and Fritz Strack, for instance, draw connections between arm movements and attitudes towards people who are not present. When flexing the arm upwards on a table (approach-like behaviour) while generating the names of famous people, they were more positive towards them than when they generated famous names during arm extension pushing down on a table (avoidance-like behaviour).<sup>6</sup>

Interestingly enough, we do not have to perform a bodily act ourselves in order to reach a certain cognitive state. In neuroscience, there is a specific body of research focusing on mirror neurons and mirror systems. Michael S. Gazzaniga, Richard B. Ivry and George R. Mangun (2009) write that '[t]he intimate link between perception and action is underscored by the fact that our comprehension of the actions of others appears to depend on the activation of the neural structures that would be engaged if we were to produce the action ourselves.'<sup>7</sup> The theory of mirror neurons proposes that there are neurons within our central nerve system (CNS), i.e. the brain, that are specialised in mimicking perceived

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6 Förster, J., and Strack, E., 'Motor Actions in Retrieval of Valenced Information: A Motor Congruence Effect,' *Perceptual and Motor Skills*, 85 (1997): 1419–1427; Förster, J., and Strack, F., 'Motor Actions in Retrieval of Valenced Information: A Motor Congruence Effect,' *Perceptual and Motor Skills*, 86 (1998): 1423–1426.

7 Gazzaniga, M.S., Ivry, R.B., and Mangun, G.R., *Cognitive Neuroscience: The Biology of the Mind*, International students' ed., 3rd ed. (USA: Norton, 2009), 283.

signals. If we see someone who is sad, for instance, or who is running, we can see through scientific studies how the brain regions involved in producing that very action or emotion are also activated in the perceiver, even if that person is not performing the act or emotion themselves. It is believed by neuroscientists interested in this field of study that the mirroring network can explain even complex cognitive processes, such as empathy.<sup>8</sup> This brings us back to the visual representation as a signifier of sound in Chapter 2. In those works of art, we cannot only see sound, in the Leppert sense, but we can also empathise with the depicted situation through our mirror neurons and our perception of the body postures. By extension, those empathic feelings and our particular understanding of the said situation affect our behaviours and attitudes.

## Attitudes and behaviours

Katz presented a paper in 1960 suggesting four motivational functions during the formation of an attitude. Firstly, attitudes can have a *knowledge function* that provides us with a knowledge-based schema that effectively helps us to form an opinion about an object or subject. These knowledge-based schemata function parallel to those attitude schemata we have formed towards other objects or subjects we have encountered, and they often attempt to be consistent with one another. Stated more clearly, our attitudes towards one object or subject are often consistent with our attitudes towards other objects or subjects. This is clear in tone production, as we have a modern knowledge base to start with (this is how a modern Classical guitar sounds, for instance) which we consciously or unconsciously transfer to the situation where we are to form an attitude towards lute sound. Or a more specific perspective, where we know that the right hand was placed very close to the bridge in the 18th century (see Chapter 2) while many colleagues today play the same repertoire closer to the soundhole (see Chapter 3). In such cases, our knowledge-based schema is caught between past and present, and where we place the emphasis between the two decides our attitude towards the other.

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8 Gazzaniga, *Cognitive*, 610 and 633.

Secondly, attitudes can have a *utilitarian function*, which means that they help us to receive rewards and punishments that make others look favourably or negatively upon us. This acts parallel to self-monitoring functions of the self, as well as our impression management. We can also maintain group belonging by expressing negative and positive attitudes according to a specific group ideology. In the same specific case above, we can confirm our belonging to the ‘close-to-soundhole’ group by our attitude to the ‘close-to-bridge’-group and *vice versa*. In this instance, our conformity towards the one rewards us within the group for opposing the other.

The *value expressive function* is a function where our attitudes let us express deeper levels of values. If we, for instance, consider a person for whom Christianity is an important value, that person will be more likely to express positive attitudes towards Christian organisations and more negative attitudes towards anti-Christian groups. Likewise, if one person finds historical evidence to be very important for their artistic practice, they are more likely to favour playing close to the bridge.

Finally, the *ego-defensive function* presents psychological defensive functions, where high self-esteem can protect us when we are confronted with attitudes opposing our persona, or from threats such as death.<sup>9</sup> If we are comfortable in our knowledge of something, that is, we have studied something well and we feel that we have authority in what we do, we are more likely to be better equipped at meeting negative attitudes. From another perspective, if one has bad experiences in sports, one may adopt a negative attitude towards sports in general to distance oneself from those negative experiences, as an act of cognitive self-defence. In the same fashion, when we form our conception of what tone production should be, we are likely to meet negative attitudes from those opposing our concept, in which case the ego-defensive function comes into play to support us in meeting those attitudes.

Other theories create a bridge from attitude formation to attitude application. Zajonc’s *mere exposure effect*, for instance, suggests that the

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<sup>9</sup> Sutton and Douglas, *Social*, 162–163.

more we are exposed to a stimulus, the more we tend to like it.<sup>10</sup> This is particularly interesting in the process in which the lute performer shapes their perception of ‘good’ tone production. What we are repeatedly exposed to over time creates a framework for what we like, and repeated exposure to a certain type of tone production may very well make us like that approach more than others. This can be linked to Martin Shepherd’s historical account of the early lute revival, when many Classical guitarists obtained lutes strung with nylon strings in unisons (see Chapter 4). The sound was closer to the Classical guitar than the gut-strung lute, but it was an acceptable starting point because they had previously been exposed to Classical guitars and not lutes. Similarly, as more musicians started to play with gut strings, or similar synthetic versions, the increasing, repeated exposure to this ‘new’ kind of sound gained more acceptance among performers and instrumentalists. The notion of acceptable tone production altered according to the mere exposure effect (among other things, of course). Similarly, David Huron (2006) provides a full-length monograph argument that what we are exposed to, statistically, forms our anticipation of what is to come. If that anticipation is true, we are psychologically rewarded by our bodily system for making a correct prediction. On the other hand, if we make incorrect predictions of what is to come, we do not feel satisfaction as we did not receive any psychological reward for being correct.<sup>11</sup> So, put simply, if we expect one sort of sound right before the lutenist starts to play, we receive a bodily reaction according to the accuracy of the prediction. This is not simplified by the fact that we, by expecting something to be bad or good for instance, adopt an attitude that increases the probability of it being bad or good. We run the risk of making up our minds before the event has even happened.

Furthermore, exposure does not only shape our preferences and anticipation. By being exposed to stimuli that we are either consciously or unconsciously aware of, and that we are either punished or rewarded for doing, we are engaging in *social learning*. This also means that we learn to associate positive or negative emotions and attitudes towards different

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<sup>10</sup> Sutton and Douglas, *Social*, 164.

<sup>11</sup> Huron, D., *Sweet Anticipation: Music and the Psychology of Expectation* (USA: MIT Press, 2006).



stimuli based on the circumstances in which we perceive them (e.g. *classical conditioning*). For instance, if a dog hears a bell ring every time he is served food, he will eventually associate food with that sound. He will then think of food every time he hears it even if there is no food present;<sup>12</sup> similarly, if we hear the word ‘Viking,’ it is easy to think of helmets with horns, even if it is generally accepted that there is no real historical evidence supporting their use. This refers back to the visual representations, the surviving literature and primary sources, modern handbooks and instrument construction; we form our attitude and perception of something not only based on what actually happens in the moment, but also based on what we have learned to expect through experience and through the causal confrontations of the past.

Whatever the function, attitudes towards tone production, whether modern or historically perceived, are formed in tension between inner and outer perspectives, or between opposing practices or groups, or between good and bad experiences. They are also formed through exposure, anticipation and experience. When constructing a conceptual understanding of what tone production is within a historically-distant practice, performed today, it is vitally important to acknowledge this point. Attitudes and ideologies, formed by social interaction and stimuli exposure, set a framework in which our self-expressive acts are perceived, interpreted and understood. This places a major emphasis on how a performer presents their tone production within a certain context and how they acknowledge the link between self-expressive acts, attitudes and embodiment. Our attitudes set the framework in which our self-expressive acts are perceived and perhaps also understood. This is where the quality of tone production is judged and it is highly individual; embodiment represents the effect caused by self-expressive acts and other bodily performances that become more or less internalised, both within the musician and the audience. Returning to mirror neurons, as pointed out by Gazzaniga et al. (2009), we see how attitudes and embodiment can present themselves differently, according to the level of expertise and motor repertoire: ‘Interestingly, the extent and intensity of the activation

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12 Sutton and Douglas, *Social*, 165–172.

pattern [as related to mirror neurons] reflect the individual's motor repertoire. Skilled dancers show stronger activation in the mirror network when watching videos of familiar dance routines compared to unfamiliar dances.<sup>13</sup> Tone production as a self-expressive act is not something that is directly related to historical practices alone, but historical practices can be used to situate oneself within the social context the performer wishes to be judged. For instance, if the performer seeks to gain acknowledgement within a dedicated scholarly context, their tone production may be vastly different to what a performer seeking to gain acceptance with the general public would produce. In the first instance, emphasis may be put on historical evidence and research literature, while in the second, it may be more important to accommodate a modern audience's expectations. Clearly, there is no right or wrong tone production *per se*, but tone production can be a social tool enabling the musician to position themselves and their self-expressive acts. If we look at this issue historically, we see how music in general was used to position oneself within a socio-political construct. For instance, the bourgeoisie could use music and other cultural activities to affirm their position towards the aristocracy within the salon culture while still maintaining their group identity; the aristocracy could show their power through their employment of a large number of musicians; and visual representations could document a certain view of the hierarchy and social differentiation.<sup>14</sup> Tone production is an important part of the musical construct, and it is in many ways a cornerstone in how we perceive a musician. This is clearly evident when many electric guitarists, used to having amplification and stomp boxes to shape their tone production, are given a nylon-string guitar. Compared to a trained Classical guitarist, the differences in how tone production is approached, and what sort of emphasis it has been given during education, is vastly different, even to the untrained ear. Furthermore, we often see great differences in which instruments are judged to be of sufficient quality for public performance.

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13 Gazzaniga, *Cognitive*, 283.

14 Rolfhamre, R., *The Popular Lute: An investigation of the Function and Performance of Music in France Between 1650 and 1700*, PhD (Norway: Faculty of Fine Arts, University of Agder).

## Self-expression versus communication

As a self-expressive act, tone production is an important part of how we perceive a performance; it is part of a communicative process in which the audience, as well as the performer, understands the performance from a certain context, and in which the performer's competence and aesthetic values are judged. In 2007, Mitchell S. Green presented a full monograph focusing on self-expression where he discusses in detail the problems surrounding the subject. Green formulates twenty *dicta* to sum up the main points of his argument (the numbering of each *dictum* has been altered from the original source, in order to avoid confusion):

1. A self-expression shows a thought, feeling, or experience.
2. A self-expression shows one's thought, feeling, or experience.
3. A self-expression is not a type of statement.
4. A self-expression is a signal.
5. A self-expression may be involuntary, voluntary, or both voluntary and willed.
6. A self-expression can be seen at once [as] spontaneous and voluntary.
7. Although one can express only those states of ourselves that can be shown, it is an open question just what this class includes.
8. A self-expression is characteristically, but not exclusively, directed toward an audience.
9. A self-expression may be directed towards an audience that is distinct from the object of the state expressed.
10. Self-expression falls into overt and non-overt varieties.
11. We can express ourselves by means of 'sayings in our heart'.
12. Self-expression is as sensitive to how an action is carried out as it is to which action is carried out.
13. One can express oneself in a voluntary act without intending to do so.
14. Like other acts, attempts at self-expression may or may not be successful.
15. What is expressed, in self-expression, can be known by introspection.
16. Self-expression need not take routinized paths.

17. Self-expression is distinct from expressiveness.
18. Corporate expression is, when successful, expressive.
19. Dramatic performances, when expressive, need not involve self-expression.
20. It is an empirical question where self-expression is found in the animal kingdom, and of its ontogenesis in any given species.<sup>15</sup>

According to Green, a self-expressive act can both show one's feeling or just a feeling in general. It does not need to be a statement but is rather a signal, independent of whether it is in fact conscious or unconscious, willed or unwilled. In the context of tone production, then, it is not necessarily the case that when speaking of tone production as a self-expressive act we are also speaking of mediating a statement. It is merely a signal that may or may not be perceived. What is particularly interesting is that Green suggests that self-expression is distinct from expressiveness and that dramatic performances, when expressive, need not involve self-expression. The self-expressing perspective on tone production is therefore theoretically useful as it does not presume that communication of a certain message arises and that the delivery from performer to audience is clear, but it assumes more directly that tone production functions as a signifier of something regardless of it being understood by others, or even by the performer themselves. According to Green, this is one of the main features of self-expression, that is, that self-expression is distinct from communication. Self-expression is about showing someone an inner state, for instance, that does not rely on anyone perceiving it (a state Green calls *perception-enabling showing*).<sup>16</sup> Communication, on the other hand, needs to be perceived by someone else in order for it to be established; otherwise it is just an attempt at communication that has failed. Yet, a self-expression that is perceived by another party in the way that it was designed to express *establishes* a communication, even if it is not communication by its own means. After exploring several perspectives

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<sup>15</sup> Green, M.S., *Self-Expression* (UK: Oxford University Press, 2007), 44–45.

<sup>16</sup> Green, *Self-Expression*, 85.

and theories, Green draws increasingly stronger connections between the words ‘self-expression’ and ‘showing’:

Where A is an agent and B a cognitive, affective, or experiential state of a sort to which A can have introspective access, A expresses her B if and only if A is in state B, and some action or behaviour of A's both shows and signals her B. [...] According to this characterization, all self-expression involves showing one's emotional, cognitive, or experiential state.<sup>17</sup>

In the above statement, there is a clear correlation between feeling something and performing an act which transfers the feeling from the internal to the external. Green presents three categories of showing: *showing that*, *showing α* and *showing how*. *Showing that* enables propositional knowledge (‘Making knowledge available doesn't guarantee its transmission’); in *showing α*, α is ‘a singular term referring to a perceptible object or affair’; *showing how* attempts transmission of how something feels, looks or sounds, etc.<sup>18</sup> He also states that ‘[s]howing-that makes knowledge-that available; showing-α makes perceptual knowledge available, and showing-how makes available knowledge of how an emotion or experience feels.’<sup>19</sup> So, no matter what category of showing a self-expression falls into, we are ultimately speaking of a phenomenon that makes certain knowledge about a specific state, object or how a particular state feels, perceptible. For someone in the right circumstances to perceive it, truthful knowledge can be transferred from one person to the next (although it is not a criterion that this transference is at all successful). Green further differentiates between ‘showing’ and ‘indication’; the former states how or what something is, or how it is, while the latter has the possibility to pretend to be something it is not. Green writes:

One thread that unites the above three forms of showing is knowledge: Evidence enables those who are shown the things mentioned above, and who are in the right circumstances (being empathetic, being in the right perceptual location, possessed of the right conceptual resources or background knowledge, etc.) to

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<sup>17</sup> Green, *Self-Expression*, 43.

<sup>18</sup> Green, *Self-Expression*, 47–48.

<sup>19</sup> Green, *Self-Expression*, 186.

know some fact, some object of perception, or how some emotion, mood, or experience feels. Showing is thus a stronger relation than indication, in two ways. First, showing, unlike indication, is a 'success' notion: One can only show facts (showing-that), or real things (showing  $\alpha$ ), or how something appears or feels (showing how), whereas one can indicate that something is so when it is not, or indicate an object that is not, or indicate how something feels that does not appear or feel that way.<sup>20</sup>

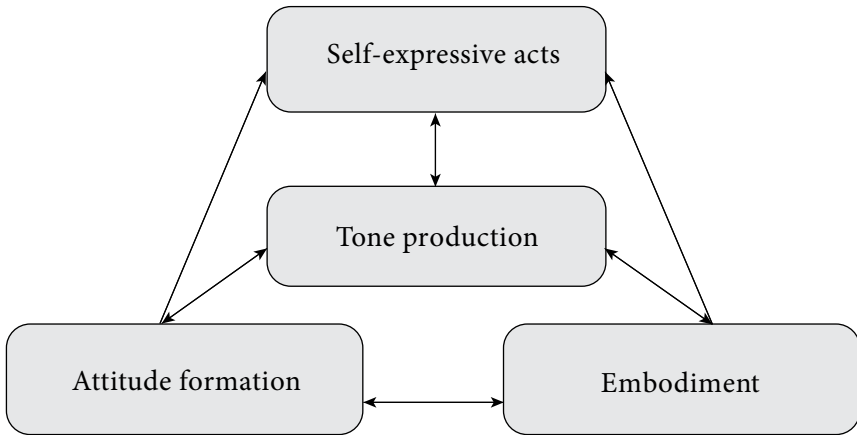
What is being brought to the agenda here is important; that is, that self-expressive acts do not need to be true in the sense of showing, but they can also be manipulated to indicate something that is not true. By indication, we can create signals meant to give the perceiver the possibility of understanding a signal without the necessity of it being a true emotion, thought or knowledge. In fact, this is what professional actors deal with on a daily basis: '[S]elf-expressions are often produced with a strategic aim over and above that of manifesting the cognitive or affective state of their producer.'<sup>21</sup> Furthermore, '[e]xpressive conventions go a step further by enabling their users to show the presence within them of certain states with a mere gesture, speech act, or other conventional device rather than with a material sacrifice.'<sup>22</sup> So, if self-expressive acts can be used to consciously convey a signal, as well as unconsciously, they can also be part of a social context where a musician can use self-expressive acts to position themselves within a certain social construct by their very actions (the blinking of an eye, heavy sigh, an arm movement, etc.). Now, what has started to unveil here is a synergetic relation between conventions of self-expressive acts, attitude formation and embodiment (see Fig. 5.1 below): Attitude formation initiates self-expressive acts and embodiment; embodiment affects our feelings and attitudes as well as the self-expressive acts they launch; and self-expressive acts can consciously or unconsciously contribute, willingly or unwillingly, to our level of embodiment and our attitude formation. It is through this complex network of being, feeling, reacting and understanding that we form our concept of

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<sup>20</sup> Green, *Self-Expression*, 49.

<sup>21</sup> Green, *Self-Expression*, 139.

<sup>22</sup> Green, *Self-Expression*, 146.



**Figure 5.1.** The relation between self-expressive acts, attitude formation, embodiment and tone production.

tone production, both consciously and unconsciously. This apparatus can then enable us to address a certain social, historical or academic practice by the mere action of producing a tone on an instrument. From the very simple act of producing a tone, we can provide the audience with signals for them to perceive (or not) where we unveil our aesthetic concept, our relation to historical data, what performance tradition we are trained in, how experienced we are, what musicians we look up to, etc. It is not only an act of producing something aesthetically valid and valuable within a certain context, but it also reveals something about the performer.

From this perspective, it is also noticeable that self-expression can be conventionalized in several ways, either through a *regularity* in behaviour; *arbitrariness* (the regularity in behaviour might have been otherwise); and when the regularity is supported by *normativity* ('[g]iven that all or most members of the relevant community conform to this pattern of behaviour, for most members of that community, conforming to that convention is proper and appropriate.').<sup>23</sup> According to these three propositions, self-expression is standardised by a set of acts that are regularly performed and understood as others perform and can relate to similar acts. I like to see this argument backwards: people jointly perform repetitious acts that articulate certain norms of signals that are meant to

<sup>23</sup> Green, *Self-Expression*, 144.

produce some sort of meaning (whether perceived by the target or not), and it is within that context that self-expression can function in relation to the other people's ability to understand how a specific signal was designed to signal.

## The social psychology of Self

If tone production is a self-expressive act, and part of an attitude and embodiment apparatus enabling us to situate ourselves socially, it is easy to argue that a book treating Early Modern tone production on lute instruments cannot only look at physicality and physics (Chapter 4), modern performance practice (Chapter 3) or historical evidence (Chapter 2). It is equally important to consider how our sociability and interaction within a certain context forms a concept of what we think proper tone production can and should be. Whatever historically-informed performance we present to an audience, that particular performance takes place today — it is designed, rehearsed, presented, improvised, perceived and understood today. As such, any performance of Early Modern music, and any attempt to understand that music's social function and location (tone production then being part of that practice) partakes in a dialogue between present and perceived past in which the 'social' functions as a filter in which all previous material is compartmentalised into meaning and understanding. Social psychology is therefore an effective perspective to address such issues, in which the more complex self-expressive acts, embodiment and attitude formations discussed above can join forces with earlier chapters, to create a functional model in which tone production can be understood.

In 1986, Doise proposed to divide social psychology research into four main approaches to analysis: 1) The *intraindividual* level of analysis focuses on what happens within an individual, bringing forth cognitive, perceptual and biological processes, for instance; 2) the *interindividual/situational* level gives attention to what happens between individuals in a given situation; 3) the *socio-positional* level centres its argument around the same premises as the interindividual/situational, but in larger institutional contexts, such as school and community; and finally, 4) the



*ideological* level brings forth matters concerning belief systems. The first two categories were, at the time of Doise's writing, more common among researchers in European countries and can be put under the label 'psychological-social psychology'; the latter two received more attention in the US and were more closely related to sociological-social psychology.<sup>24</sup> Raymond Macdonald, David Hargreaves and Dorothy Miell (2002) further divided psychology into three main categories: *cognitive*, *emotional* and *social*. Previous research, they argued at the time, had been disproportionately concerned with cognitive and emotional aspects of psychology, but socially-focused works are less well represented. Together, they posit three social functions of music for the individual, these being *interpersonal*, *mood*, and *self-identity*:

First, people use music as a means of developing and negotiating interpersonal relationships. One's musical preference can define which social groups one does and does not belong to, and this is particularly clear in the case of teenage music preferences [...]. Secondly, an increasing body of evidence shows that people use music as a means of regulating their mood, and that this is mediated by the immediate social environment in which listening takes place. This can explain patterns of musical taste and preference which are linked with specific listening situations and social circumstances [...]. We suggest that one of the primary social functions of music lies in establishing and developing an individual's sense of identity, and that the concept of *musical identity* enables us to look at the wide-spread and varied interactions between music and the individual.<sup>25</sup>

Following this argument, music making, or more specifically, tone production, can be used to develop and negotiate interpersonal relationships when a practice is used by more than one person to define a social group (those playing close to the bridge versus those who do not, for instance). It can also be used to illustrate a mood, by actively changing position to alter the tone quality, or affecting or contradicting the mood by a certain *modus operandi*. This is particularly interesting in later Baroque music,

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<sup>24</sup> North, A., and Hargreaves, D., *The Social and Applied Psychology of Music* (UK: Oxford University Press, 2008), 3–4.

<sup>25</sup> Macdonald, R., Hargreaves, D., and Miell, D. (Eds.), *Musical Identities* (USA: Oxford University Press, 2002), 5.

where modern musicians prefer a warmer sound than the more wooden, transient-rich tone suggested by original sources (Chapter 2). In addition to preferences stemming from the Classical guitar and other more modern musical practices, it may also have to do with a modern alignment between, for instance, ‘melancholy’ and warm, soft sounds to create a more intimate, introverted soundscape than a metallic, harsh tone would. In this sense, historical evidence is ignored to avoid cognitive dissonance in the modern perceiver. By promoting such a perspective, we also emphasise tone production as part of a social practice in which the performer takes measures to consciously align their self-expressive act with the perceiver’s attitudes and expectations, not to mention conforming to their expected anticipation in a way that reflects positively on the performer. Tone production becomes one of many mediums in which the performer is enabled to self-express.

Various disciplines within psychology theorize the self differently. In social psychology, the *self-concept* is a collective term that embraces all the different sets of beliefs that people have about themselves. A self-concept can further be broken down into different *self-schemas* that represent individual sets of beliefs about oneself that help people process self-relevant information in certain contexts.<sup>26</sup> All self-schemas relate to each other, since they are functioning within the same human being. The degree to which these self-schemas are clearly and confidently defined, consistent with each other, and temporarily stable, can be labelled *self-concept clarity*. *Self-awareness*, on the other hand, provides a dialogue

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26 There seem to be different terminological practices concerning the points that Douglas and Sutton wish to address by their use of self-concept and self-schemas. For instance, North and Hargreaves employ self-systems and self-concept respectively, where their self-concept seems to be equivalent to Douglas and Sutton’s self-schemas; see North and Hargreaves, *Social and Applied*, 45. The self-systems and self-concepts terminology is also employed in Macdonald, Hargreaves and Miell’s *Musical Identities*, only they mention *self-images* as an alternative word for self-concept; see Macdonald, *Identities*. On the other hand, Robert H. Woody, Sr. uses a self-concept and self-schemata that is in line with Douglas and Sutton’s writing; see Woody, R.H., *Social Psychology and Musicianship* (USA: Meredith Music Publications, 2012), 35 and 42. A choice must be made, then, on what terminology to employ. I have chosen to go with the set of terms set up by Sutton and Douglas for two reasons: first, their book is of a later publication date and, as such, more up to date with recent progressions within the field of social psychology; secondly, I find the use of self-concept, rather than self-system, to be more descriptive and in line with the arguments I wish to make in this book.

between the self-concept and reality and it encompasses the psychological state of being aware of one's self-concept; one can be self-aware about private, personal aspects of one's self (*private self-awareness*) as well as public aspects of the self (*public self-awareness*), i.e. how these aspects may be seen by others in the exterior world. One can be self-aware to the degree that it becomes a chronic concern (*private self-consciousness* and *public self-consciousness*).<sup>27</sup> The self is, then, a construct, something that is dynamic and develops, adapts and preserves what someone is in various contexts. Our views on ourselves, our confidence and attitudes (to name a few perspectives) are not fixed in the sense that we can speak of a conceptual understanding of something, such as tone production, as something going from A to B as a simple aesthetic act, but are formed and evolving within the performer. I have experienced myself that when I play, sometimes, I can feel pretty confident and pleased with my tone production, while on other occasions I can find my tone production to be rather appalling, unfocused and annoying, even if I seem to be doing the same thing when reviewing my technique in a mirror. What happens at such times, in my case, is that I fall victim to my mental and emotional state in such a way that my attitude at each given moment affects my private self-awareness and self-consciousness, which in turn has repercussions for how I choose to perform in each situation. In such cases, my tone production is not necessarily a product of any sort of historical enquiry, or deliberate relation to my colleagues' practices, but rather a self-centred, inner dialogue in which I create my tone out of sheer problem solving and negotiation with my self-perceived shortcomings. It is, therefore, a matter between me and the external public self-consciousness and public self-awareness.

In reviewing these social psychological perspectives of the self, one soon thinks of the Freudian concept of *id*, *ego* and *superego* that one can find in psychoanalytically-flavoured musicological works.<sup>28</sup> But E. Tory Higgins (1987) has argued that Freud's model, along with other models, lacks 'a systematic framework for revealing the interrelations among the

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<sup>27</sup> Sutton and Douglas, *Social*, 53–54, 56, 58–60 and 62.

<sup>28</sup> See for instance: Middleton, R., *Voicing the Popular: On the Subjects of Popular Music* (London and New York: Routledge, 2006).

different self-states;<sup>29</sup> ‘A disadvantage of a principle that is intuitively appealing and simple and that promises a wide range of applicability is that it tends to be used to understand phenomena with little questioning of its hidden assumptions.’<sup>30</sup> Higgins rather speaks of a threefold self-concept that consists of the 1) *actual self*, based on a person’s knowledge about the self at the present time, 2) the *ideal self*, which constitutes a person’s desired self (i.e. how that person would like to see their Self) and 3) the *ought self*. These instances of the self can, in turn, be perceived by one-self or by others. Based on this, we can divide the self into smaller, more concentrated fractions: actual/own, ideal/own, ought/own, actual/other, ideal/other and ought/other.<sup>31</sup> When some of these do not correspond to one another we reach a state of cognitive dissonance that, depending on the gravity of that dissonance, can cause more or less discomfort. Therefore, we constantly try to balance all these parts of ourselves through the processes of *self-regulation* where one tries to morph one’s behaviour to fit an ideal or ‘ought standard’ of the self.<sup>32</sup> According to one of Higgins’ later papers, (1997), people have two distinct self-regulatory systems: promotion and prevention. The *regulatory focus theory* that he promotes suggests that people can seek to construct their self either by an active, approaching effort to reach that state (promotion) or by a more cautious and avoidant mentality towards the path leading to the self.<sup>33</sup> Higgins uses the following example to explain this:

To reduce the spread of AIDS, for instance, campaigns for condom use have naturally framed the persuasive messages in terms of safe-sex and the dangers to be avoided, which involve a prevention focus and anticipating undesired end-state [i.e. we are asked to think of what we should avoid by using a condom]. But at the critical moment when condoms will or will not be used, the partners are more likely to be in a promotion focus and anticipating desired end-states [i.e. what we want to achieve by the act]. Thus messages with a promotion focus

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29 Higgins, E.T., ‘Self-Discrepancy: A Theory Relating Self and Affect,’ *Psychological Review*, 94 (3; 1987): 319–340, 320.

30 Higgins, E.T., ‘Beyond Pleasure and Pain,’ *American Psychologist*, 52 (12; 1997): 1280–1300, 1290.

31 Higgins, *Self-Discrepancy*, 321; Sutton and Douglas, *Social*, 64.

32 Sutton and Douglas, *Social*, 64–65.

33 Higgins, *Beyond*; Sutton and Douglas, *Social*, 65–66.

on anticipated desired end-states might be more effective (e.g. condom use promotes a caring relationship).<sup>34</sup>

This remark is interesting because it draws attention to how approaching consistency at both ends of a communication can establish a better rapport. If we were to present our tone production through a performance to an artist we admire, that interaction would probably have an immense effect on our perception of our own practice, according to how we are met. If the admired artist meets us in a preventive manner ('don't do this; avoid this way of producing a tone') or a promotive ('try this; this will help you convey what you tell me you wish to convey') we will gain quite different understandings of the situation, which again affect our attitude towards the artist and ourselves. What's more, they also affect how we embody that situation. Rhetorically, do we get a feeling of having failed in our mission, or are we given the sense of learning how to master it even better, and how does this affect our hormone production? Robbie Sutton and Karen Douglas write:

People behave towards others in ways that help them validate their perceptions of self. This may be reflected in who we choose as friends. For example, if you think of yourself as outgoing and sociable, it helps to have friends who think the same of you.<sup>35</sup>

In this quote, we clearly sense the importance of considering social interaction and group construction when discussing tone production as a self-expressive act. In fact, it also draws attention to how we often seek to be part of social groups where our self-perception corresponds to what other group members think of us; that is, we seek conformity between the interior and exterior. In developing a tone production, then, it is not only a matter of establishing one's position within a certain context, but also of feeling acceptance of that said context by conforming the actual self to situations where one feels a positive response from others. An important part of this process has to do with *self-presentation*. We mould and shape the manner in which we present ourselves to others so that we are perceived in

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<sup>34</sup> Higgins, *Beyond*, 1297.

<sup>35</sup> Sutton and Douglas, *Social*, 83.

the way we want to be perceived. By *self-monitoring* we are being sensitive to how we are perceived, so that we can appropriate our self-expression to constitute the impression we wish to give (*impression management*).<sup>36</sup> The way we express ourselves and construct our *self-presentation*, that is, how we deliberately present ourselves to others, has a great effect on how we partake in a social group; how, for instance, musical meaning can be mediated, understood and appropriated, and how musical identities are valued and perceived. The *social comparison theory* of Festinger (1954), for instance, suggests that we get to know and crystalize our self by comparing ourselves to others. We compare ourselves with those who are better or worse than us at certain things (*upward* and *downward social comparison*), and we engage in *temporal comparisons* where we juxtapose our past and anticipated future self. For instance, by comparing ourselves to a past version of our self, we might perceive that our present self is better, which perhaps would make us feel better about ourselves.<sup>37</sup>

The drive for self evaluation concerning one's opinions and abilities has implications not only for the behaviour of persons in groups but also for the processes of formation of groups and changing memberships of groups. To the extent that self evaluation can only be accomplished by means of comparison with other persons, the drive for self evaluation is a force acting on persons to belong to groups, to associate with others.<sup>38</sup>

This is a very important apparatus when developing a concept of tone production. We compare our tone concept to others to know what we want, or do not want, to achieve and what we do or do not like; we look back on past documentation (recordings, videos and other means of documenting) to

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36 Festinger, L., 'A Theory of Social Comparison Processes,' *Human Relations*, 7 (1954): 117–140; Sutton and Douglas, *Social*, 70–72 and 83.

37 Music's role as a social phenomenon and as a marker (both as a unifier and divider) has been widely addressed by musicologists, especially since the end of the twentieth century (to name only a very few: Clarke, E.F., *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (USA: Oxford University Press, 2005); DeNora, T., *Music in Everyday Life* (UK: Cambridge University Press, 2000); Gracyk, T., *I Wanna be Me: Rock Music and the Politics of Identity* (USA: Temple University Press, 2001); Middleton, R., *Studying Popular Music* (USA: Open University Press, 1990); Middleton, *Voicing*; Moore, A.F., *Song Means: Analysing and Interpreting Recorded Popular Song* (England: Ashgate, 2012); Walser, R., *Running with the Devil: Power, Gender, and Madness in Heavy Metal Music* (USA: Wesleyan University Press, 1993)).

38 Festinger, *Social Comparison*, 135.

feel proud of where we have come; and we use comparisons to feel more secure, or insecure, about the choices we make as performers.

## Self-expression and identity

There is no denying that self-expressive acts and tone production are highly related to identity, which can be seen as the perceived result that arises from the performance of people's self-concepts. Stan Hawkins writes in *Settling the Pop Score* (2002) that:

identities are performatively constituted by the artist's expression, and [...] there are important links between music reception and identity [...]. In my research into identity formation in pop music, it has become more and more evident that pop culture forms a site where identity roles are constantly evolving to fit social needs.<sup>39</sup>

Hawkins touches on a critical point. By our self-awareness, self-consciousness, regulatory activities, comparisons and impression management, we construct identities that are constantly evolving to fit certain social needs. We performatively constitute our identities through our actions and self-expression, which again reveal something about us, regardless of whether it is perceived or not. Identity is about what a person is or is not, and how a person's identity relates to other identities through sameness or difference, i.e. we can assert that we belong to a certain group identity, but that very group identity can be quite different from another. '[T]he dominant group must set itself apart from that it is not, in order to seek that which it wishes to be.' Hawkins points out that identity and binarism, however, do not automatically go hand in hand: 'identity might be considered as flexible and free-floating and not divided into clear cut groups: women and men.'<sup>40</sup> Whatever the classification, it is clear that we relate to others through our constantly-evolving identities. Tone production as a self-expressive act has little to do with historical practice *per se*, it has to do with us, that is, how we wish to be perceived. Rhetorically, am I

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<sup>39</sup> Hawkins, S., *Settling the Pop Score: Pop Texts and Identity Politics* (UK: Ashgate, 2002), 12.

<sup>40</sup> Hawkins, *Pop Score*, 13.

a historically-aware artist? Am I a scholar first and foremost? Am I a free spirit? Am I a provoker? Am I afraid of criticism?

Self-expression and identity are two separate things. The first takes the position of the object's acts while the latter takes the position of how those acts, in sum, are perceived. We can then speak of identity as an effect of self-expression rather than a genuine substance; this effect is constituted upon an interplay between symbols and fantasy: 'a most effective way of comprehending identity is by disconnecting it from an "essence" and perceiving it as a dramatic effect rather than an authentic core. [...] Music can profile identities through us mapping the symbolic with the imaginative.'<sup>41</sup> If tone production then is a dramatic effect, we further realise that the implication of this statement goes far beyond the simple change of tone quality when playing for aesthetic variety, to include perspectives where we also elaborate our identities through our tone production. So, by identifying with the identity of a person or group, one can reach intensified aesthetic experiences of music. The compound of that aesthetic experience can create rapport on different levels — 'gender', 'race', 'sexuality', or 'community', for instance — that can function as communication, establishing a connection between individuals; one can say that this phenomenon establishes a pathway for performative self-expression. The persons' joint understanding of an identity construct within a certain socio-cultural setting makes self-expression performative in that both sides of an aesthetic, interpersonal connection can understand it.

## Self-expressive acts and interpreted material

So far, I have separated self-expressive acts and identity from the historical discourse, focusing more on the present than the past. In dealing with the past, however, we are constantly met with the dilemma of interpretation. If we are to build our identity, our concept of tone production, social positioning and understanding of our self-expressive acts properly in *relation to historical evidence*, we are always in the position of guessing. The results unveiled in Chapter 2 give us hints on what tone production

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41 Hawkins, *Pop Score*, 14



could be, but we cannot know for sure how that actually sounded, or even if what was written corresponds to actual practice. We cannot know definitively that we, today, understand the sources properly; we can only rely on our interpretations of the sources. It is through these interpretations that we position ourselves in today's 'Early Modern' musical practice. Charles Taylor writes:

[i]nterpretation, in the sense relevant to hermeneutics, is an attempt to make clear, to make sense of an object of study. This object must, therefore, be a text, or a text-analogue, which in some way is confused, incomplete, cloudy, seemingly contradictory — in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense.<sup>42</sup>

Taylor's statement can at first seem somewhat straightforward, but there are numerous problems to be found, making the relation between text and interpreter far more complex. Taylor writes that:

[a] successful interpretation is one which makes clear the meaning originally present in a confused, fragmentary, cloudy form. But how does one know that this interpretation is correct? Presumably because it makes sense of the original text: what is strange, mystifying, puzzling, contradictory is no longer so, is accounted for.<sup>43</sup>

The question is, then, to whom does it make sense? My standpoint is that we cannot *prove* anything of the past, but we can discover and unveil material, and from that material we can theorise, formulate and suggest. But the question is perhaps not only what the signifiers signify, but rather what the signifiers afford — what do I extract from them as a scholar? Take, for instance, the classic case of Wittgenstein's rabbit-duck illustration; if we only see it as a rabbit, our discourse would go into quite another direction than it would if we saw it as a duck. So, the greatest importance is perhaps not what a signifier can signify, but what it affords and how we articulate that affordance. The world opened up by the text —

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42 Taylor, C., 'Interpretation and the Sciences of Man,' in G. Delanty and P. Strydom (Eds.), *Philosophies of Social Science: The Classic and Contemporary Readings*. (UK: McGraw-Hill, 2003): 182–186, 182.

43 Taylor, *Interpretations*, 183–184.

what Gadamer calls the ‘matter of the text’<sup>44</sup> — presents us with more, deeper-level problems than what Taylor’s above-mentioned hermeneutics addresses. While testing Gadamer’s hermeneutics, Ricoeur writes: ‘Would it not be appropriate to shift the initial locus of the hermeneutical question, to reformulate the question in such a way that a certain dialectic between the experience of belonging and alienating distanciation becomes the mainspring, the key to the inner life, of hermeneutics.’<sup>45</sup> In this quote, Ricoeur places the interpreter within a dialectic relationship between text and self, between inside and outside, rather than being overly occupied with epistemological foundations. The interpreted text then presents itself as the nexus of its syntactic construction, its intended signification and how it is perceived and articulated by the interpreter. Clearly, we cannot detach ourselves from the interpretation, and the matter of proper understanding of Early Modern tone production on lute instruments becomes somewhat obsolete. What we should ask, then, is rather *whose* understanding of tone production we are approaching, in what context that tone production came to be, the function of that said approach to tone production, and what that tone production says about the person performing it.

Notice how Taylor touches upon an important aspect of hermeneutics: ‘Even if there is an important sense in which a meaning re-expressed in a new medium cannot be declared identical, this by no means entails that we can give no sense to the project of expressing a meaning in a new way.’<sup>46</sup> Re-expressed meaning is, then, according to Taylor’s statement, something other than the meaning inherent in the original text. Thus, there is a gap between the meaning expressed in the original text and the new expression presented by the person interpreting the original. Ricoeur touches upon the issue:

For if the primary concern of hermeneutics is not to discover an intention hidden behind the text but to unfold a world in front of it, then authentic self-understanding is something which, as Heidegger and Gadamer wish to say, can be

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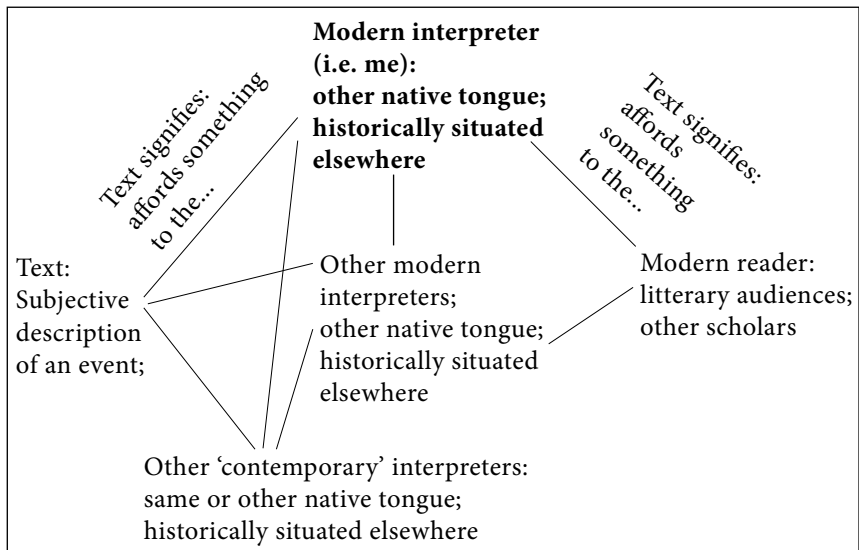
44 Ricoeur, P, ‘Towards a Critical Hermeneutic: Hermeneutics and the Critique of Ideology’, in G. Delanty and P. Strydom (Eds.), *Philosophies of Social Science: The Classical and Contemporary Readings* (UK: McGraw-Hill, 2003): 172–181, 175.

45 Ricoeur, *Hermeneutic*, 173.

46 Taylor, *Interpretations*, 183.

instructed by the 'matter of the text'. [...] To understand is not to project oneself into the text but to expose oneself to it; it is to receive a self enlarged by the appropriation of the proposed worlds which interpretation unfolds.<sup>47</sup>

If we either expose or project ourselves onto the text, we are also presented with an intricate hermeneutical problem within the written text itself. Take, for instance, a seventeenth-century description of a performance practice. First of all, it is the subjective account of another; we cannot know if this account would be representable if we ourselves were there to see the same event being described. The writer becomes the interpreter of that event. Second, we interpret that interpretation. Third, meaning can be lost between languages. From the seventeenth-century French language to modern French and from there to English, for instance. In my case, I am neither a native English speaker, nor French, German, Spanish nor Italian. Fourth, as I previously mentioned affordance, we quickly see how a single signifier affords differently among people living in the same period, but also across the centuries. Furthermore, this present book will again be read and interpreted by someone else. What we see here presents a huge problem (see Fig. 5.2 below).



**Figure 5.2.** Illustration placing myself in the chain of interpretation and mediation.

47 Ricoeur, *Hermeneutics*, 176.

Ricoeur argues that writing is more than a fixation of discourse; it presents a threefold autonomy ‘with respect to the intention of the author; with respect to the cultural situation and all the sociological conditions of the original text; and finally, with respect to the original addressee.’ The text as a signifier is something else, has another destiny, than the original intention of the author.<sup>48</sup> Ricoeur’s text autonomy, in my case, must by extension be considered in multiple layers: the original text being interpreted, the text written by the interpreter or interpreters, and finally, the ‘matter of text’ as perceived by the reader.<sup>49</sup> Although it would be easy to paint a melancholic picture of the hermeneutical scholar and their seemingly impossible task,<sup>50</sup> I would rather look at hermeneutics from a positive angle. When several scholars present well-founded interpretations, i.e. present a thoroughly-constructed argument, we can revisit their constructions of interpretation to reassess their findings and, over time, strengthen the probability of the hermeneutic body of scholarship. Following such a line of argument, it is clear that a successful interpretation of a cultural phenomenon such as tone production must be interdisciplinary.

To draw this chapter to a close, self-expressing places tone production into a context emphasising the personality inherent in tone construction where we can produce an idiolectic sound quality, one that people recognise as ‘our sound’. Our bodies function in a way that what we do also receives a physical reaction, not only within ourselves through embodiment, but also in others through empathic cognitive systems (among others). Tone production as a self-expressive act is not something that is directly related to historical practices alone, but historical practices can be used to situate oneself within the social context the performer wishes to be judged; they can be used to position oneself within a socio-political

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48 Ricoeur, *Hermeneutics*, 174.

49 ‘In short, the work decontextualises itself, from the sociological as well as the psychological point of view, and is able to recontextualise itself differently in the act of reading. It follows that the mediation of the text cannot be treated as an extension of the dialogical situation’; see Ricoeur, *Hermeneutics*, 174.

50 See, for instance, Wegman, R.C., ‘Historical Musicology: Is it Still Possible?’ in M. Clayton, T. Herbert and R. Middleton (Eds.), *The Cultural Study of Music: A Critical Introduction*, 2nd ed. (USA: Routledge, 2012): 40–48.

construct. They function within a synergetic relation between conventions of self-expressive acts, attitude formation and embodiment.

Tone production as a self-expressive act can then enable us to address a certain social, historical or academic practice by the mere action of producing a tone on an instrument, providing the audience with signals for them to perceive (or not) where we unveil our aesthetics, identity and training. Tone production is not necessarily a product of any sort of historical enquiry, or deliberate relation to other colleagues' practices, but rather a matter between me and the external public self-consciousness and public self-awareness. We compare our tone concept to others to know what we want, or do not want, to achieve and what we do or do not like; we look back on past documentation to feel proud of where we have come; and we use comparisons to feel more secure, or insecure, about the choices we make as performers. Tone production can also function as a dramatic effect to consciously or unconsciously elaborate our identities. As a self-expressive act, it is performative in that both sides of an aesthetic, interpersonal connection can understand it. When judging someone's tone production, we must ask: whose understanding of tone production it is; in what context that tone production has come to be; the function of that said approach to tone production; and what that tone production says about the one performing it. Traditionally, it would be possible to say that this book could very well have begun and ended with Chapter 2, possibly also Chapter 3. But we have also seen the importance of getting our feet properly grounded by asking how things function physically as a chain of reactions. Lastly, what this chapter has shown is that a concept of Early Modern tone production for lutenists is not only about historical practice and evidence, or who has the strongest authority within music performance. It has rather to do with who we are; who we want to be; who we wish to be acknowledged by; what social formations we wish to be accepted in; and so on. Tone production is as much about historically-informed practices and respect for the past as it is about self-expressive acts, attitudes, social relations and embodiment. This latter understanding of the topic becomes even more intriguing when we look at tone production on a technological level, where bodily, physical and social interaction are superseded by recording mediums.

# Recording

Let us now transcend the action of producing and perceiving a tone to how we document and mediate it through technology. For the twenty-first century lutenist, technology is ever present. When we play at a concert, someone places a microphone before us; we record music that we try to get published by a label; we make home recordings that we share through online networks such as Sound Cloud, YouTube or Facebook (the list could go on). To this day, much has been written on the recording process, but there are still considerable holes to fill within academia. Handbooks treating the recording process and mixing<sup>1</sup> often provide thorough understanding of technological processes, but they usually neglect the artistic effects of technological decisions. Also, since the end of the twentieth century, recorded music has been a preferred text to analyse in popular music studies,<sup>2</sup> but Early Music is noticeably absent in these contexts. More recently, the recording process itself has been accepted as an academic discipline,<sup>3</sup> and some also take into account how more detailed levels of technology shape creativity and aesthetics.<sup>4</sup> However, the classical genres are still underrepresented in academic literature when it comes to recording technology,

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1 Such as Gibson, D., *The Art of Mixing: A Visual Guide to Recording, Engineering and Production* (USA: Artist Pro Publishing, 2005); and Miles Huber, D., and Runstein, R.E., *Modern Recording Techniques* (USA: Focal Press, 2010).

2 To name only a few: Hawkins, *Pop Score*; Lacasse, S., 'Intertextuality as a Tool for the Analysis of Popular Music: Gérard Genette and the Recorded Palimpsest,' *Practicing Popular Music: 12th Biennial IASPM International Conference Montreal 2003 Proceedings*, edited by Alex Gyde and Geoff Stahl (Montreal: IASPM, 2003): 494–503; Moore, *Song Means*; and Zagorski-Thomas, S., 'The Stadium in your Bedroom: Functional Staging, Authenticity and the Audience-Led Aesthetic in Record Production,' *Popular Music* 29, (02; 2010): 251–266.

3 See for instance Frith, S., and Zagorski-Thomas, S. (Eds.), *The Art of Record Production: An Introductory Reader for a New Academic Field* (UK: Ashgate, 2012).

4 Such as Collins, K. (Ed.), *From Pac-Man to Pop Music: Interactive Audio in Games and New Media* (UK: Ashgate, 2008).

and even more so the lute. By discussing the dialectical relationship between the lute and recording technology in the twenty-first century at a deeper level, I will address the transformative processes from which recorded lute sound evolves. (I speak now of the more general 'lute sound' rather than tone production, because we are addressing both its production and representation.) My motivation stems from a hypothesis that a performer can no longer consider their authenticity (whether authenticating his or her own persona, the work, the genre or the audience) as detached from, or independent of, the production process. This is especially true at a time when musicians have been given the possibility of performing, even existing, in multiple countries at the same time through various streaming and downloading agencies. In fact, the self-expressing tone production, including its historical, contemporary and physical building blocks, now enters a new level of significance. This is because we no longer act in the same room or time where that very act is received and also possibly perceived. Our possibilities of positioning ourselves socially, as discussed in Chapter 5, are suddenly theoretical. We don't know who the perceiver is, where they are or even when they are active. We cannot judge them by their appearance to adjust our impression management, nor can we know beforehand if our recording appeals to critics or 'fans.' We are naked, so to speak, and can only present ourselves and our self-expressiveness in a one-way communication without getting instant feedback from our audience.

The lute makes a particularly interesting case here because it has such a feeble, crisp and weak tone, making it quite troublesome to record well. The dynamic range is restricted in such a way that the clear tone and the noise produced upon playing (such as breathing, the changing of hand positions, and noise from the chair while moving around) are difficult to separate; sometimes in quieter passages the noise can overpower the clear tone and attract more attention. The strong, quick attack that comes directly upon plucking a string and the much weaker and quickly dying tone that follows present other problematic issues; for instance, when setting proper recording levels that are strong enough to produce a good sound without having the signal exceeding its maximum level. Moist or dry environments can affect the thin woodwork of the instrument in a manner that alters the tuning and tone quality of the instrument to a

greater degree than other instruments associated with the Early Music genre (see Chapter 4). In a post on the *Unquiet Thoughts from Mignarda* blog on 27 October 2010 we find a description of the problems surrounding a lute recording that is quite revealing:

[...] Recording the lute [...] can be a musician's worst nightmare, and lutenists can be the bane of an engineer's existence. Since the lute is so quiet, a recording engineer's tendency is to place a microphone close to the instrument so as to cancel out extraneous noise that can filter in, even in the controlled environment of a recording studio. There is typically a protracted negotiation between the lutenist and the engineer that involves a great deal of experimentation with microphone placement and, likewise, a great deal of whingeing on the part of the musician. The engineer wants the mic closer, the musician doesn't like the intimidating, nervous-making thing so close, nor the presence of string noise and breathing in the recorded result. Money is spent and no one is happy. The best solution is to record in a very live, resonant space that is relatively quiet and allows both musician and engineer to relax and capture a pleasing natural sound with the mic at a comfortable distance.

Recording in old churches with their conducive atmosphere, high ceilings, hard surfaces and spacious resonance – the preferred venue for lute recordings – can be nearly impossible because of noise from building mechanical systems, traffic and routine neighborhood activity. [...] If ventilation systems aren't running, the space is probably either cold and damp or hot and stuffy, affecting the sound of the instrument, tuning stability of the strings and concentration of the lutenist. [...] Then there is the sometimes bizarre, unfocused sound resulting from the lutenist's refusal to allow the microphone to be placed so close that finger noise or breathing might possibly be detected. What is heard is more of the room echo and less of the real instrument and the musician's interpretation. This is not happenstance, it is a choice on the part of the lutenist and producer. [...] But the manufactured perfection listeners have come to expect in recordings of lute music is not the same as what one actually encounters attending a live concert, with human beings reacting to music being performed by other human beings.<sup>5</sup>

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5 This post can be read in full at: Unquiet Thoughts, 'Is Lute Best Heard Live or on Recordings,' *Unquiet Thoughts from Mignarda*, 27 October 2010. Retrieved 16 July 2014. URL: <http://mignarda.wordpress.com/2010/10/27/concert-versus-recordings/>.



## Recording and engineering mentalities

On the technological journey from sound waves to electric currents to binary digital information, back to electric currents and back again to sound waves,<sup>6</sup> it is clear that sound, after being produced, lives a complex life before reaching our ears. During the long evolution and debate of the authentic, and later historically-informed, performance in Baroque music, we have seen numerous recordings being produced all over the world. The discussions are often focused towards the musician and their instrument, but the technological production and its aesthetical compound are often neglected within the field of 'Classical music.'<sup>7</sup> In recent years, we have seen how music reviewers also include comments or even grades on sound quality, yet, what is often neglected is how the sonic design of the recording relates to historical data in terms of 'sound' and not only performance. As Lelio Camilleri points out, although much more obvious in popular music productions, 'the studio has become a compositional tool in which musical ideas are formed into sounding matter.'<sup>8</sup>

One considerable difference in the recording of 'Popular' music *versus* 'Classical' is the sonic and spatial mentality behind the production. In popular music productions, close microphone placement, acoustic separation and use of multiple microphones have become a natural part of both the sonic and spatial design. Frequency modulation, panning, amplitude and effects are used in order to create a superficial sonic sphere appropriate to the product itself, rather than thinking of its live re-enactment before or after the recording session (of course, there are exceptions to this statement). On the other hand, Classical music always seems to seek 'natural' sounds and it is rather unusual to hear recordings truly elaborate with sonic matter. Simon Zagorski-Thomas (2010) suggests that 'the fact that these musical forms pre-date recording mean that there is greater resistance through the recording process,' but there is perhaps

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6 Or more materialistically: From sound to microphone, through cables, into the recording machine, through an AD/DA converter, into the DAW (Digital audio workstation), transformed to a 'master' of some sort (physical or virtual), and finally into the industrial press machine.

7 Generally, I am careful in using terminology such as 'classical', 'rock', etc. due to their wide adoption and the spectrums of assumptions accompanying them. I have nonetheless decided to use such terminology in this essay for the sake of clarity.

8 Camilleri, L., 'Shaping Sounds, Shaping Spaces,' *Popular Music* 29, 2 (2010): 199–211, 199.

more to it than that.<sup>9</sup> Thanks to Herbert von Karajan's will to explore and embrace the new recording technology from the end of the 1930s, there is no doubt that Classical music has joined the technological sphere. But when focusing on spatial and frequency exploration and modulation, the 'resistance' mentioned by Zagorski-Thomas proves more evident. Developments in the 'Classical' genre seem, up until today, to have focused more on high fidelity and the perfection of sound, rather than exploring *new* sounds and spatial placement (such as guitars all panned to the right and the accordion all to the left). When discussing high fidelity (hi-fi), Zagorski-Thomas brings into focus some requirements for good sound quality. The frequency range should be broad enough to retain all aspects of a sound, making the reproduced sound identical to its source (free of distortion and noise, and with loudness and dynamic range<sup>10</sup> being comparable to the original source).<sup>11</sup> Further on, he mentions two additional stipulations, maintaining spatial naturalness and life-like reverberation, which are often neglected as 'attempts to reproduce the full dynamic range of a concert hall in a small listening room would not create a very pleasing effect.'<sup>12</sup> Recent recordings have, however, proven to be more interested in elaborating on these points. We can often see a division between the sizes of the ensembles recorded, where orchestras are often sonically presented in a concert hall with the reverberation that follows, and ensembles are more widely panned and are perceived to be placed more closely to the listener. This is, of course, a natural phenomenon due to the physical size of an orchestra *versus* the chamber ensemble. An ensemble is more

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9 Zagorski-Thomas, *Stadium*, 263.

10 The *dynamic range*, in the context of this paper, is the range between the lowest and highest sounding volume (i.e. amplitude) of an instrument or recording equipment. For example, a piano has a wider dynamic range than a flute using standard playing techniques.

11 Paradoxically, after achieving best possible sound, the recording quality is reduced by half or sometimes even a fourth of its resolution to fit on a CD. Lislevand, R., *La belle homicide: manuscrit barbe* [CD], France: Naïve, 2003, was, as an example, recorded on a Nagra digital field recorder (24 bit/88.2 kHz resolution) which suggests that, in order to fit on a CD (with an industrially-standardized resolution of 16 bit/44.1 kHz), the resolution of the original file had to have been cut in half before it could be printed on a CD (Lislevand, *Homicide*, booklet: 27). Another oxymoron is the application of *dithering* in the mastering process, where one adds low levels of noise to the digital sound file in order to 'hide' digital miscoding and thus reduce the perceivable noise upon listening.

12 Zagorski-Thomas, *Stadium*, 261–262; Although those willing to embrace the digital plug-in world are given many options in restoration and creation using reverb effects.

likely able to appear in a smaller room, putting the listener closer to the instruments than a massive orchestra, and thus making the spatial distribution between the instruments more obvious. Turning towards film music we soon realize that the case is quite different. Whereas the ‘Classical concert’ recording tries to restore natural spatialisation, the modern film scores are recorded more ‘hot,’<sup>13</sup> ‘clean’ (i.e. low levels of noise) and sonically detailed. Instruments are more three-dimensionally placed within the sonic frame (which does not need to reproduce reality), the perceived ‘sonic headroom’<sup>14</sup> appears larger, and featured instruments are emphasized when needed. In this case, the sonic treatment in film music becomes interesting if we turn to Early Music ensemble recordings (as well as several contemporary art chamber music recordings). For example, in the recordings *Forqueray: Pieces de viole avec basse continuë* (1995)<sup>15</sup> and especially *Santiago de Murcia Codex* (2010),<sup>16</sup> we see how headroom, spatial use, and hot level resembles more closely the mentality of film scores than recordings of later period classical projects. Solo recordings of lutes present a different case again, as can be heard in many recordings where the lute is placed at a certain distance, preferably in a church with quite a lot of reverberation. One of the exceptions is found in Anthony Bailes’ recording *Lute Music of the Netherlands* (2012),<sup>17</sup> presenting a much more detailed, ‘roomy’ quality in opposition to his earlier recordings, *Gaultier:*

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13 Within all analogue recording equipment, sound is processed as electrical currents. Recording ‘hot’ signals is a popular metaphor of maintaining a high level of electrical currents within the equipment through the recording process, making the physical wire within the electronic circuits reach a higher temperature (hence the use of the word ‘hot’). This terminology has come into use also when using digital equipment as a signifier of the same recording mentality (note, there are wires in digital equipment as well). Some positive outcomes of this mentality result in increased dynamic range and better signal-to-noise ratio (i.e. the distance in volume between the inherent noise of music recording equipment and the recorded sound. Put simply, the greater the distance between sound and noise, the less the noise is heard during playback).

14 The term ‘headroom’ can be interpreted in several ways. In this case I refer to ‘headroom’ as a metaphor of the perceived sonic space upon listening. This means, for example, that by modifying the frequency range, as well as reverberation, one can create an illusion of situating the recorded instruments in a more spacious room (especially on the perceived vertical axis).

15 Pandolfo, P., Balestracci, G., Lislevand, R., Egüez, E., and Morini, G., *Forqueray: Pieces de viole avec basse continuë* [CD], Spain: Glossa, 1995.

16 Ensemble Kapsberger and Lislevand, R., *Santiago de Murcia Codex* [CD], France: Naïve, 2000.

17 Bailes, A., *Lute Music of the Netherlands* [CD], Germany: Carpe Diem, 2012.

*Apollon orateur* (2009)<sup>18</sup> and *Une douceur violente* (2011),<sup>19</sup> where the strong church-like reverberation is clearly present.

## Cosmetics and editing

One does not have to investigate much before realizing that there is a gap between what is produced on the recording *contra* 'live' on stage. Perhaps one important factor to consider in this context would be 'sonic memory.' As memory (in this case long-term memory) is triggered by repetition, it soon becomes evident that repeated listening to a recording makes the memory of it more consistent,<sup>20</sup> compared to a concert performance only heard once. Thus, it is understandable that a recording artist would wish to make that sonic sensory *autograph* flatter by editing the recording.<sup>21</sup> Also, when we cannot interact directly with the audience, we are also more interested in creating a good impression regardless of context and situation. Humans are, after all, human, and even the most accomplished musician sometimes wishes to be able to go back to a concert and do something a bit differently. In a concert this is, of course, not possible<sup>22</sup> but recording technology enables us to make those changes. Still, at a concert, small 'human alterations' or even mistakes are, to some extent, accepted but never so on a recording. As a microphone perceives more in a 'live' situation than our ears can, the musician becomes more self-conscious than perhaps they would have been in a concert. A small, unconscious body movement inaudible on a concert stage could certainly be audible on the recording, thus making the musician focus even more on controlling their movements; especially considering the possibility of turning up the volume, making the details and ambient noises even more

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18 Bailes, A., *Gaultier: Apollon orateur* [CD], Belgium: Ramee, 2009.

19 Bailes, A., *Une douceur violente* [CD], Belgium: Ramee, 2011.

20 Especially since cerebral regions activated by listening also appear to be active while remembering music; see BBC 'Musical Minds: Imagining and Listening to Music (Excerpt)'; [YouTube video] 2009. Retrieved 31 July 2012, URL: [http://www.youtube.com/watch?v=\\_FkdDX--IaU](http://www.youtube.com/watch?v=_FkdDX--IaU).

21 Camilleri, *Shaping*, 200.

22 Although I did indeed participate in a concert once in Oslo where the piano soloist asked the audience if she could do her performance of a certain piece again as she did not believe she played it well enough the first time.

evident. Those otherwise inaudible sounds suddenly interact with, blend with or even compete with, our recorded tone production.

## The Classical recording in a consumer context

Although recordings of Early Music perhaps wish to capture a ‘natural’ performance, placing the listener in the audience, they get edited and polished beyond naturalness. In addition to the mixing traditions previously mentioned and the performer’s aesthetic agenda, this may perhaps have something to do with market criteria. Mixing engineer Dave Pensado comments (although in a different context than Classical music), ‘Back when radio stations ruled the world, if you did a mix you only had to compete against other songs in the genre you were working in [...], but now, in 2012, you have to compete against everything.’<sup>23</sup> Modern audiences, thanks to the Internet, are often not only attracted to one or two genres alone. The same person could have hip-hop, rock and Classical music on the very same playlist, which inevitably places Classical music next to other genres with completely different sonic approaches. Pensado further makes a comment (a mix of humour and reality, as is often the case in his videos) that he mixes rock as if it was hip-hop. I suggest this also applies to Classical music to some extent, as modern technological possibilities and trends form our expectations of good sound (e.g. emphasized bass register and noise-free sound). This is not to say that a Classical piece would be mixed in the same way as a song by Rihanna. Rather, when a listener places a Classical piece on their playlist next to a rock song, they do not expect to have to, for instance, increase the volume every time a piece by Bach comes up, or have their ‘ears explode’ every time the next piece starts and the volume has been turned up too loud. This brings us to another crucial aspect of today’s recording, mixing and mastering reality — the compressor. A *compressor* reduces the overall dynamic range of a recording (making quiet sounds louder and

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23 Pensados Place ‘Into the Lair #42 - Working with Bass and Kick Drums.’ YouTube video, 10’53”, posted by ‘Pensado’s Place’, retrieved 10 August 2012, URL: <http://www.youtube.com/watch?v=1OfSS3Py-Tk>; I have omitted superfluous words like ‘uhm’, and repetitions of words while thinking of what to say in this quote.

loud sounds quieter), to allow the music to be played at higher volumes.<sup>24</sup> Compression is an integral part of most recordings today, independent of genre. It is used during production, post-production and in mastering. As it directly alters the natural dynamics of recorded music (making the dynamic range of the original performance narrower),<sup>25</sup> compressors become essential to consider. (Especially in terms of ‘authenticity’ and music mediation). What’s more, given the compressor’s function as a sort of automatic volume controller, by increasing the volume of quiet sounds it makes the inherent production noise more apparent.<sup>26</sup> The compressor does not only affect the dynamics of the performance alone, but also the dynamic relation between the musician and their sonic surroundings. By extension, dynamic compressors are not only employed during the production process alone, but also, for several reasons (such as making music audible in noisy environments), during all types of broadcasting. Television channels, radio stations and online distribution all add compressors to audio signals. (Even the satellites directing TV and radio signals affect sound quality through their encoding into MPEG-2, or MPEG-4 formats incorporating AAC data processing.<sup>27</sup> The music TV channel *Mezzo* is one of many channels streaming through such satellites.<sup>28</sup>) Obviously, a whole range of additional problems arises during music-streaming, but I will not treat these matters in detail here. One may rightfully argue that the CD is an obsolete and outdated recording medium, which is increasingly set aside by more modern technologies, such as streaming. In fact, initially, my idea was to include the more recent developments in stream-

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24 This process differs from another important method called *normalisation* that raises the whole sound to a chosen level related to the sound file’s highest sound (both loud and quiet sounds get louder). Normalisation can only be applied following a completed sound file (while compressors can be used in real time) and does not alter the dynamic range internally as the compressor does (as it makes everything louder) and will thus not be treated in detail in this paper.

25 In some dance genres the dynamic range gets compressed to a volume difference (between the loudest and the quietest sound) of between 2 or even 1 dB.

26 Thus, we understand better why it is important to maintain a proper signal-to-noise ratio (see Note 8 for explanation) during the recording process in order to minimize perceived noise at later stages of the production.

27 The AAC format follows the same principles as the famous MP3 format, using algorithms to extract all ‘unnecessary’ information (at least according to the algorithms) from the original sound file, making the new version take up less memory space and processing power.

28 Lyngsat, ‘Mezzo,’ *lyngsat.com*. Retrieved 6 September 2017, URL: <http://www.lyngsat.com/tvchannels/fr/Mezzo.html>.

ing on computers, smartphones and tablets, and the lute's appearances in gaming, film and 'second-life' virtual reality games as well, but the topic soon overwhelmed me, given the context of the present project. Not only because there are so many variations and possibilities to consider, but also because their technological use and repercussions vary from instance to instance. Furthermore, they present many hidden processes to which I have no access (both for practical and juridical reasons) which would make the consistency of the line of reasoning that I wish to present here difficult. What should be noted is that the technology used in modern streaming (and other types of uses) is based on the same principles as that of the CD. As such, CD technology has not only an archival, historical function, but also works to provide a pedagogical tool for understanding later technologies. That is, the underlying principles remain the same, upon which one must consider each separate distribution medium through their technological framework. (The latter is even further complicated by the fact that some people listen through smartphones, for instance, where both the streaming service, the phone itself and the earbuds all transform the sound in their own specific way. Clearly, it would be almost impossible to offer the reader clear options to optimize the fidelity of lute tone when played back on a tiny smartphone speaker, for instance, without knowing the specifications of all components involved. The CD, then, provides a common ground of standardised and disclosed processes which can later be transferred to other media services through dedicated reading on the relevant issues for a specific situation. Furthermore, as the main ambition in this chapter is not foremost a practical one — when we upload a sound file to YouTube, Distrokid or Spotify, for instance, we give up our hands-on influence on the result to their respective predetermined algorithms — but a theoretical one, to understand the biology of lute sound from a meta-perspective (which I return to in the final Conclusion), the now old-school technology of the CD recording will suffice. On this background, I will for the remainder of this chapter focus on the CD for the sake of clarity and efficiency, leaving discussions related to more recent technological developments to future projects which can treat the subject from more approachable perspectives.

## Recording technology and authenticity

There is a tension, then, between technology, performance and scholarly contributions that we must not fail to consider. Alan Moore states in his book *Song Means: Analysing and Interpreting Recorded Popular Song* (2012) that there is no single notion of authenticity. By directing us to five key moments in history towards developing 'authenticity' as a concept, Moore reveals several aspects in which authenticity becomes an issue: 1) the collecting of folk tunes and putting them to new use in creating nationalistic music; 2) the friction between autonomy and function, between the musician's self-realisation and the audience's expectations; 3) friction between music responding to market needs and music attempting to *annex* one in the emergence of rock 'n' roll; 4) the tension between an artist's accepted persona and their received transgressive persona; and 5) the opposition between mind and body. Moore's discussions, of course, direct themselves to recordings of music from a period of time other than the Early Modern period, incorporating a rather different cultural context (not to mention a different source and empirical reality). The second case of friction above (between autonomy and function and between the musician's self-realisation and the audience's expectations) stands out, in our case, as most obviously related to our situation. He writes:

On the one hand, an expression is valued because its production appears to rest on the integrity of the performer, an integrity that is read as secure, as in some sense comfortable. On the other hand, an expression is denigrated because that integrity appears, from the viewpoint of the critic, to have been compromised [...] the commonest attribution to the term 'authentic' in relation to music refers to the maintenance of the origins of a performance practice.<sup>29</sup>

On hearing an Early Modern CD, we perceive the musician's presentation of historical music. We listen to their attempt to interpret the written material, channelled through their personal subjectivity and integrity. The critic, then, does not actually criticize the 'authenticity' of that performance solely based on the written material it interprets (be it literature or a musical score), but rather based on the performance of

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<sup>29</sup> Moore, *Song Means*, 262–263.



that material as interpreted by the musician. Also, the lute tablature used to denote the lute repertoire I am concerned with here, by its very nature, is even more open to interpretation than regular staff notation and leaves much of its realisation to the integrity of the performer. The question of ‘authenticity’ is thus strongly connected to the musician’s own historical understanding of baroque music tradition and the performance as presented on the CD. Moore further directs our attention towards two schools of addressing ‘authenticity.’ On one hand, we find ‘authenticity’ as ‘purity to practice,’ and on the other, ‘authenticity’ as ‘honesty to experience.’ In extension of the latter, Stephen Felds argues (cited by Moore) that ‘authenticity only emerges when it is counter to forces that are trying to screw it up, transform it, dominate it, mess with it.’<sup>30</sup> The two practices are perhaps more difficult to separate when speaking of historical music than in speaking of modern genres such as pop, rock and jazz. To provide an example from my personal experience, one of the most frequent debates I encounter when talking to fellow lute players is that of whether one should or *can* play lute music on the Classical guitar or not, as it is not ‘authentic.’<sup>31</sup> The critic then assumes a judging role, claiming to possess the ‘truth’ of how music was appreciated and received in the seventeenth century and how it should be performed today. So, with Felds’ comment in mind, ‘authenticity’ becomes a matter of right and wrong in order to protect one’s own position, and this is, at least so I believe, a dangerous path to follow. It is crucial to be aware of the fact that those people fighting for this culture (in my case Early Modern lute music) live today, or at least in recent history. Our modern notion of ‘authenticity,’ then, is based on modern research projects — ‘authenticity’ becomes ‘maintenance of the modern scholar’s practice.’ And this is why it is hard to separate the subjectivity of ‘purity to practice’ and ‘honesty to experience,’ at least in terms of scholarly works, as they solely build on a modern understanding. In light of this, we find Moore’s perhaps most important argument:

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30 Keil, C., and Feld, S., *Music Grooves: Essays and Dialogues* (Chicago: Chicago University Press, 2994), 296, cited in Moore, *Song Means*, 262.

31 Of course, I frequently meet with opposing opinions as well. I recently had the good fortune to perform Antonio Vivaldi’s concert for two flutes in C major together with a famous flute player who, right before we entered the stage, amusingly said to me: ‘Vivaldi is dead. We can do whatever we want.’

[M]eaning is not embedded in the music listened to, but is discovered in the act of listening, and I can see no reason why attributions of authenticity that are, after all, an aspect of meaning, should fall into a different class. This means that any analysis that claims that a particular song, or a particular performance, is authentic must be regarded with suspicion. [...] ‘authenticity’ is a matter of interpretation that is made and fought for from within a particular cultural and, thus, historicized position. Like all meanings, it is ascribed, not inscribed.<sup>32</sup>

‘Ascribed authenticity,’ then, questions the integrity of the subject with whom we relate, making the musician the actual focal point. It may be, as Moore puts it, more ‘beneficial to ask who, rather than what, is being authenticated by that performance.’<sup>33</sup> If we let ‘who’ signify the ‘recorded performer,’ we can see how the technological aspects (such as recording equipment, aesthetical choices and market expectations of technological performance) provoke questions of how the modern Early Music performer is authenticated through the CD. Recall the many aspects altering the sound, not only by perceived frequency content, but also dynamically and spatially. The music we hear on the recording is something other than what we would hear sitting in the same room next to the musician (not only from an ecological point of view but also from a pure, cognitive-perceptual viewpoint). The ‘live’ musician is transformed into a medium that evidently did not exist in the Early Modern era and so becomes a construct of Other — a representation of a constructed musician. As a result, we may ask ourselves if the ‘authentic Early Modern music CD’ is in fact plausible or even possible?<sup>34</sup> The Early Modern music CD balances between, or becomes the *nexus* of, the different aspects of a CD production’s construct. Thus, on one hand, we have the production team (performer, recording team, producers, manufacturers, etc.) and on the other, the scholarly dialogue with the past (empirical data, scholarly work and theorisation). So, within the sonic autograph of an Early Modern lute music record, we meet the need to carefully balance the performer’s artistic intentions and the musicological foundation

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32 Moore, *Song Means*, 265–266.

33 Moore, *Song Means*, 260–271.

34 We see how Zogorski-Thomas’ hi-fi criterion, referred to earlier, of reproduced sound being identical to its source, suddenly must be regarded from other perspectives.

behind the music (whether empirical or subjective) with the listener's own expectations. Following previous discussions, it is not hard to argue that the truly interesting aspect in our case is perhaps not the aesthetical choices, authentication or sonic design *per se*, but the unforeseen and perhaps unexpected results of interaction between music, research and technology. Furthermore, what we see is how the perspectives presented in Chapter 5 are also valid here. The matter of positioning ourselves through tone production as self-expressive acts is now transferred to the technological realm. We can now speak of how the recorded music positions us within a social construct, how it is judged (e.g. attitudes regarding authenticity) and how we preserve our self and identity. I find this multifaceted perspective on recording fascinating, as it works against viewing the singular recording as merely an artistic product, but rather reframes the singular recording as part of a self-representation and self-formation. By constructing and designing the sound on a CD, for instance, we deliberately work with the re-representation of our tone production. It is then easily argued that recorded lute sound must be seen as an entity other than the original performance and performer, and that within an analysis it must be judged on its own merit (this has, in fact, already become the practice of most musicology, taking the recording as case).

The question of authenticating the performer, then, must be addressed at the intersection — the dialogue — between performer and recording, in the relation between the sum of technological production and, to borrow Philip Auslander's terminology, musical persona.<sup>35</sup> This is, however, somewhat troublesome. If recorded lute sound has become something other than lute sound itself, as a result of the processes behind its appearance, then how can one authenticate the other? Perhaps authentication of the artist is rather to be sought, where they approve of the final recording; it authenticates their vision of how they wanted it to sound — the vision is authenticated through the recording process. There are, of course, many other instances where authenticity can be ascribed and debated: How is a recording authenticated by its audience? How is it authenticated, to use

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35 Auslander, P., 'Musical Personae,' *The Drama Review* 50, 1 (2006): 100–119, [http://www.posgrado.unam.mx/musica/lecturas/interpretacion/complementarias/perspectivaFenomenologica/Auslander\\_Musical%20Personae.pdf](http://www.posgrado.unam.mx/musica/lecturas/interpretacion/complementarias/perspectivaFenomenologica/Auslander_Musical%20Personae.pdf).

Serge Lacasse's terminology, at an *archiphonographic*<sup>36</sup> level?<sup>37</sup> How is it authenticated by the record label (for instance: 'this is how our productions should sound,' 'this is our sound')? Situations like these cannot be treated without incorporating cultural and social aspects in order to deal with them; as I am not concerned here with the cultural implications of recorded lute sound but rather its transformation and how it evolves, I will not go any further into these topics. It follows, then, that we cannot simply speak of the authenticity of a lute recording without bringing it into a cultural and social relation, presenting a set of parameters around which the discussion will evolve. Authenticity, then, can be seen, at least from the line of argument that I have pursued here, rather as a tool for cultural discourse than for authentication itself (audio forensics, of course, uses the term 'authenticity' differently, but their process is somewhat different from what I am trying to depict here).

## Technological considerations — approaching a biological perspective

Jack Martin and Tom Jessell state in *Essentials of Neural Science and Behavior* (1995), that '[c]olors, sounds, smells, and tastes are mental constructions created in the brain by sensory processing. They do not exist, as such, outside the brain.'<sup>38</sup> Sound is only, in reality, physical movements of particles (see Chapter 4), and it is not until it passes the ascending neural auditory pathway (from the outer ear, through its cochlear transcoding, all the way through the brainstem to the higher processing of the cerebral cortex) that it becomes music. Consequently, it becomes evident that technology *per se* physically blends with the original instrument before reaching our perception as one unit. By following the sound of lute chronologically throughout the recording process, using

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36 'In the first area, we find a single item, archiphonography, which is concerned with relationships occurring at the highest, most abstract level. Paraphrasing Genette, it consists in the entire set of general categories—types of discourse, performing styles, musical genres—from which emerges each singular phonogram;' Lacasse, *Intertextuality*, 496.

37 Lacasse, *Intertextuality*, 496–497.

38 Kendall, E., Schwartz, J., and Jessell, T., *Essentials of Neural Science and Behavior*, International edition (USA: McGraw-Hill, 1995), 370.

a computer to store the sound until it reaches the state of a physical CD following the Red Book standard, we can see how tone production and the recording process live a more complex life than a simple documentation process. In fact, we see how the original lute sound is deconstructed and remodelled through a process where every action and decision take part in shaping our tone production. Let us now review the process step by step.

## Microphones

The first stage of lute sound transformation is through the microphone, a so-called transducer, where periodic pressure waves are converted into electric currents. When sound reaches the microphone, it makes the membrane inside of it move according to the pressure waves it perceives. Through electrostatic (condenser-type microphones) or electromagnetic (dynamic-type microphones) principles, an electric current is generated that reproduces the sound by alternating the electric current. Obviously, the design of the membrane plays an important part in the sound it produces. A dynamic microphone membrane is heavier to move than a condenser, making the response to the sound it perceives somewhat slower. Another factor to consider in terms of microphone design is its characteristics (i.e. at what angle from the centre of the microphone it perceives sound). Omnidirectional microphones perceive an equal amount of sound from all around, no matter the angle; cardioid microphones perceive most from in front, which decreases in proportion to the increase in the angle from the centre, receiving next to nothing from behind (depending on the particular microphone); bi-directional microphones perceive sound that reaches them from behind as well as from in front, but not from the sides.

These characteristics can be used close to the instrument for more direct sound, placed at a distance to record the acoustics of the room, or in pairs to record stereo. As soon as multiple microphones are in use, one risks phase problems such as comb filtering; this is especially important to consider when using pairs of microphones in stereo configurations, as they are often relatively closely spaced (see Chapter 4).

A microphone will also inevitably perceive the environment in which it is placed. The closer to the instrument, the more of the direct instrument sound is captured; the more distance from the instrument, the more the room is heard. Also, the closer the microphone is placed to the instrument, the more its timbre is altered, as all instruments project different frequencies in different directions. Additionally, the characteristics are crucial when setting the ratio between instrument and room sound. An omnidirectional microphone facing an instrument will capture more of the room than a cardioid microphone would in the same place. Further, the microphone actually perceives more noise from the environment than what we hear upon listening in the same situation, as our minds emphasise the sounds they find most interesting (and that is usually not noise, for instance, from lamps or the refrigerator). This means that the sound forwarded by a microphone is a distorted version of the internal balances of the auditory scene when compared to how we perceive the environment where the microphones are placed; however, when listening to the sound recorded through the microphones, we perceive the noise in the same way as the microphone picked it up. Of course, some of the noise we hear on a recording may stem from the equipment's self-noise; I will return to this matter very soon. It becomes clear, then, that microphones, and the way they are treated, are considerable contributors to recorded lute sound. If we were to admire a recording of lute music, finding the sound of the lute precious, we would perhaps ask ourselves: 'Wow, that sounds nice! Which lute is it?' but perhaps our enquiry would be more properly expressed by 'Wow, that sounds nice! What lute *and* technology have been used?' However, as it becomes clear that the construct of microphones (and other electric equipment) is indeed important to consider, I must also briefly address the electrical circuitry from which it emerges.

## Into the circuit — join the resistance!

In the end, a mixing engineer (whether they are also the artist or the producer) works by modulating electric currents. The dB measured by LED's or a VU meter on their analogue mixer is not actually dB SPL (sound

pressure level) but in fact dBv (voltage).<sup>39</sup> Also, all recording equipment has its own sound; Api, SSL and Neve, for instance, are textbook examples of this, as they are quite easy to separate aurally when compared. The specific colour that each of them possesses depends on their design (both internally and externally), which components have been used and how in the electric circuitry. While preparing this chapter, I made a journey of discovery by opening up a small four-channel mixer I have at home, to see what I found inside. (Due to legal considerations, I will not provide any exact information on the manufacturer's identity or product identifiers for each separate component; I will only refer to their type and function.) The channel strip (i.e. the pathway the recorded sound travels from input to master section) consists of input, a three-band equaliser (EQ), pan pot, auxiliary send and return pots.<sup>40</sup> Interestingly enough, what I found inside was just a number of resistors, capacitors, transistors, diodes and internal circuits (IC's).<sup>41</sup> A very brief mention of the function of each of these will suffice to unveil why it is interesting. A resistor provides resistance to the current that enters it, lowering the voltage; a capacitor charges and stores voltage, only to discharge it slowly when the power is cut off; a transistor can be seen as a specific kind of relay that can be used to amplify a signal; diodes ensure that electrons can flow in only one direction, often used to protect components; finally, IC's are actually circuits capsuled in a small plastic box. In my quest into my mixer I could identify two different IC's: An operational amplifier type that amplifies the signal considerably; and a voltage comparator type that compares two signals and passes on the strongest of the two. The interesting part, I think, is how our lute sound has now been reduced to energy storage, energy resistance and amplification. We can perhaps say that in speaking of acoustic sound, we focus on sound propagation, whereas in terms of electric circuitry it is more about

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39 When speaking of electricity there are four parameters that we deal with: *voltage* (V), *amperage* (I), *resistance* (R) and *wattage* (W). Voltage refers to the force in which electricity is conducted; amperage is the current (i.e. flow) per second; resistance is the resistance the current meets when travelling through matter; and wattage is the labour produced by the others.

40 I will not go into detail on the function of these controls as it is not directly important for my line of argument; for more information on what mixers are and can do; see Huber and Runstein, *Recording*.

41 Obviously, the manufacturer does not wish people to see what is inside without breaking it, so I can only refer to what I saw through my investigation.

forming the signal; in other words, in dealing with acoustic signals we try to understand what happens and how we can deal with it, but in electric circuits we need to focus more on what we create, how it can be created and how that creation shapes the original sound.

It is not always easy to grasp directly how these basic functions can, for example, select frequencies (as we see in an EQ for instance), morphing them into a new sound. To give an example of how this can be done we can turn our focus towards a very simple EQ circuit that can be applied in speakers, recording equipment and playback hardware. At first, we can construct an easy low-pass filter (i.e. low frequencies are passed and higher frequencies are attenuated) by placing a resistor in series with a non-polarised capacitor; the capacitor builds up and stores voltage exponentially over time and a resistor reduces voltage. It is in the relation between these two that we can construct a cut-off frequency (see Equation 6.1):

$$f_c = \frac{1}{2\pi CR}$$

**Equation 6.1.** Equation for calculating the cut-off frequency in a simple RC circuit.

C is the capacitance in farads, R is the resistance in ohms ( $\Omega$ ) and  $f_c$  is the cut-off frequency. So, if we have a resistor of 10 k $\Omega$  (kiloohms) and a capacitor of 15 nF (nanofarads), we provoke a cut-off frequency of 1061 Hz. Now, if we were to reverse our circuit, placing the capacitor before the resistor, we would achieve a high-pass filter (i.e. passing high frequencies and not low), and by employing the same mathematical formula, we can calculate its cut-off frequency. By extension, if we want to create a band-pass filter (attenuating frequencies both higher than and lower than certain frequencies) we simply combine the two, making the current pass through a low-pass filter before a high-pass filter. Auditory circuitry, then, is simply about altering and moulding electric currents employing simple components in a specific sequence.

The fact that sound is now processed as electric currents presents us with some potential problems; electromagnetic and electrostatic energy may enter our circuits and produce noise that we did not intend to record in the first place. Also, each piece of equipment we use produces some



level of self-noise (information in so-called ‘specs’ normally accompanies equipment to inform the buyer of these conditions for that specific product). Recording hot levels (i.e. recording at the highest possible volume without disturbing the signal, making the physical wire hotter) is one way to deal with self-noise. Increasing the volume when recording makes the recorded signal much louder than the noise — increasing the so-called signal-to-noise ratio (S/N ratio); the low amplitude noise can later be cut off, perhaps by using a gate (i.e. a tool where all sound below a certain dB level is silenced; of course, not without more or less affecting the frequency construct of the recorded sound). If the recorded signal is too low it blends with the self-noise and becomes next to impossible to separate without severely compromising the sound; so, we see that the S/N ratio is in fact important to consider. The question we must ask then is: how does increased amplitude upon recording affect the captured sound? Allow me once more to employ some basic physics. Newton’s second law of motion ( $F = MA$ ) teaches us that acceleration is proportional to the force that is applied to it.<sup>42</sup> Therefore we must differentiate between two instances: Firstly, when two identical sounds are played at the same time, the amplitude doubles accordingly (a 6 dB amplitude becomes 12 dB and a 1dB amplitude becomes 2 dB); secondly, when volume is turned up in a circuit, more voltage is presented to the entire signal, meaning that whether the amplitude of that signal is 2 dB or 50 dB, they both increase with the same force (2 dB + 6 dB = 8 dB; 50 dB + 6 dB = 56 dB). (All this can be traced back to the earlier-mentioned phase issues, such as comb filtering.) This is interesting if we consider that when music is being played through two closely-spaced speakers, both of these instances will occur; increasing the volume will induce an equal amount of voltage into the circuitry, but the identical parts (not to mention the non-identical parts) of the two sound streams (i.e. coming out from the left and right speaker) will behave differently, according to the basic principles stated above. From this we learn that a hot level will eventually influence the amplitude of the recorded signal;

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42 The equation has, of course, been much refined, by Albert Einstein among others, since Newton first presented it, but this is beyond the realm of this chapter.

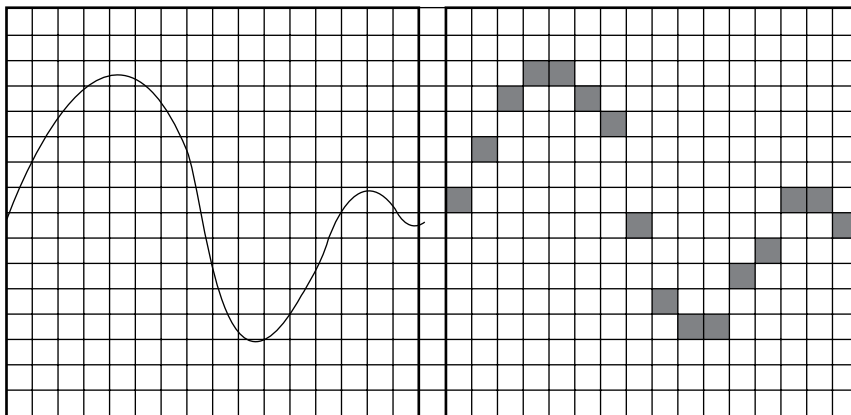
however, vast numbers of factors appear (more than we can investigate in this context) such as: where the speakers are placed within the room; what the acoustics of this particular room are; and what everything is made of (both speakers and room). The list goes on. To bring this exploration to a close, we can state that the level of voltage induced into the circuitry (at least at later stages in the process) affects lute sound. In conclusion, we see that electric circuits and the design of equipment (such as microphones, amplifiers and mixers) not only transfer sound from one instance to another, but also transform lute sound; yet, as we will see, this is only the first transformative process which lute sound encounters.

## To bits and pieces — on PCM, Nyquist and jitter

So, the question then is, what happens when lute sound enters the digital domain? The keyword here is pulse code modulation (PCM).<sup>43</sup> PCM is a technique where one takes digital snapshots of a sound. An analogy from the movies can provide a quick introduction to the process: A film consists of thousands and thousands of still images; by fast-forwarding the film in front of a projector, we perceive the fast-going sequence of still images as moving pictures. The same (almost) applies to PCM: The film itself represents the time domain and each separate image represents quantisation. Since we are dealing with still images, it follows that we must divide time into segments of representation. In films we can speak of a frame rate of 24 frames per second (i.e. every second you are presented with 24 still images in succession). In audio, however, we speak of frequency rate. If the frequency rate is 44.1 kHz, it means that every second the ears are exposed to 44,100 still images of the sound. Each sonic still image consists of data describing the positive or negative amplitude at that moment out from a pre-set grid. To put it briefly, a 24-bit rate provides a denser grid (enabling each reading to be closer to the original sound) than an 8-bit rate (see Fig. 6.1 below).

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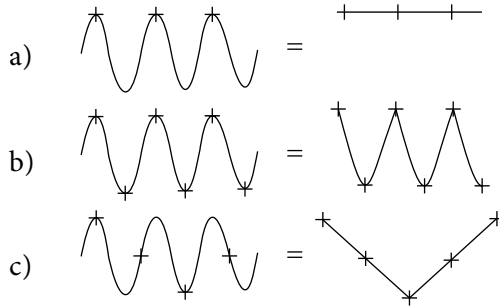
43 To be more exact, *linear pulse code modulation* (LPCM).



**Figure 6.1.** Illustration showing a sample rate and bit rate partitioning of a sound pressure wave.

So, when entering the digital domain, the sound segment gets partitioned horizontally (sample rate) and vertically (quantisation; bit rate) into binary code (i.e. 0s and 1s). Human hearing can perceive frequencies as high as roughly 20 kHz (i.e. 20,000 cycles per second), so we can understand that proper PCM coding is crucial for the design of lute sound. In order to cover the full range of human hearing we would perhaps believe it to be sufficient to divide the sound horizontally into 20,000 fragments per second to cover every cycle; however, each cycle consist of both positive and negative amplitude and therefore needs two readings per cycle (one for positive and one for negative). As a result, we must divide the sound segment into at least 40,000 segments per second to cover the full range of human hearing (see Figs. 6.2a and 6.2b below). The Nyquist Sampling Theorem states that ‘[i]f a function  $x(t)$  contains no frequencies higher than  $B$  hertz, it is completely determined by giving its ordinates at a series of points spaced  $1/(2B)$  seconds apart.’<sup>44</sup> If the sampling frequency is less than two times the highest frequency of interest, one risks provoking aliasing errors, meaning that wrong readings create an unwanted phantom tone (see Fig. 6.2c below). This is the reason why high quality, modern digital audio software often offers much higher sample

<sup>44</sup> ‘The Nyquist-Shannon Sampling Theorem.’ Retrieved 6 September 2017, URL: [http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Nyquist-Shannon\\_sampling\\_theorem.html](http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Nyquist-Shannon_sampling_theorem.html).



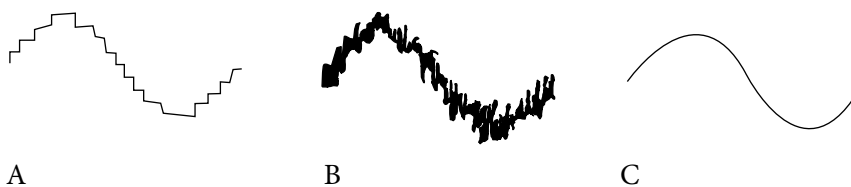
**Figure 6.2.** Example A and B illustrate the need for two readings per cycle. Example C illustrates aliasing.

rates than what is needed (such as 88.2 kHz or 92 kHz) — put crudely: The higher the sample rate, the less aliasing.<sup>45</sup> (Recall that there are higher frequencies at work than we can perceive, and those frequencies can cause aliasing.) One way in which developers have dealt with aliasing is by applying an anti-aliasing filter before the signal enters the sampling function. The logic is simple: cut away the undesired frequencies above the Nyquist limit before they are transformed into code.

Now, let us consider amplitude quantisation (measured in bit rate). Bit rate tells us the vertical density of the grid upon which an individual sample can be locked (as seen in Fig. 3); it basically informs us of how many 0s and 1s are being employed to describe each level of the grid; 3-bit offers eight levels (i.e. 000, 001, 010, 011 ... 111), 16-bit subsequently offers 65,536 levels (0000000000000000, 0000000000000001, etc.) and 32-bit offers 4.3 billion levels. Again, the logic is easy: The denser the grid (i.e. the higher the bit rate), the closer the digitized audio resembles the signal it receives from electrical circuits. The only problem is, however, that no matter how high the bit rate is, it will still move stepwise from one level to another (see Fig. 6.3a below). Again, developers have provided a solution: dithering. Dithering implies that noise is added to the digital signal, making the signal bounce back and forth between neighbouring bit levels (see Fig. 6.3b below). Of course, this only makes the signal noisier, but if one subsequently averages the signal, one will even out the signal and make

45 National Instruments, 'Analog Sampling Basics.' Retrieved 13 July 2013, URL: <http://www.ni.com/white-paper/3016/en/-toc3>.

the bit levels smoother, resembling even more closely the original signal (see Fig. 6.3c below).<sup>46</sup> By following the simple (at least theoretically) steps of PCM coding presented up until now, working with as high bit and sample rate as the system allows, one produces better sound representation. (It must, however, be reduced to fit the CD's 16-bit and 44.1 kHz sample rate in the mastering process; I will return to this issue soon.)



**Figure 6.3.** Example A illustrates an undithered signal. B illustrates dithering. Example C illustrates a dithered signal that has been averaged.

A final issue that we must address when discussing digital recording is jitter. An analogue to digital converter (ADC) or digital to analogue converter (DAC), for example, employs an internal clock to control when a signal is to be converted. When that internal clock signal does not correspond to the periodicity of the original signal, we get jitter. Jitter can affect both the time domain and the amplitude domain and result in noise, popping sounds, phase problems and altered frequency representation; it can be caused, for instance, by electromagnetic interference, as well as non-corresponding clocks between multiple equipment. To deal with this, many studios and software employ a master clock to control all other clocks; it can function both within the computer and control outboard hardware.

This second transformation of lute sound is perhaps even more clear than the previous one, as it deconstructs sound (or rather the electric representation of sound) into fragments that are described by numbers. For some recordings — more frequently in other genres than lute music — the story ends around here. The digital sound file is uploaded to free-to-use online services, such as YouTube and Sound Cloud, or sold through services such as iTunes and Amazon; broadcasting and

<sup>46</sup> National Instruments, *Sampling Basics*.

different sorts of sound compression now become an issue, but, as stated earlier, I will only consider the physical CD. Before the music reaches the listeners, in this latter scenario, it must be attached to a physical format that can be distributed and sold; I will now look into that process — the third transformative process — to see how lute sound is affected by this technology.

## Into the press

A CD is an optical disc that must follow IEC standard 60908 for Compact Disc Digital Audio (CDDA, often classified as Red Book CD). The part of the IEC standard for CDDAs (I will keep referring to them simply as CDs) that is interesting for us in this chapter is that a CD must incorporate a 44.1 kHz sample rate and a 16-bit rate standard. This means that high resolution projects (i.e. those with a higher sample and bit rate than those demanded by CDs) must then be converted into 44.1 kHz and 16-bit format (recall the Nyquist Sampling Theorem mentioned earlier; 44.1 kHz means that it can replicate pitches up to 22.05 kHz) using a converter that can be either hardware, stand-alone software or integrated into a sampling program (such as Cubase, Logic or ProTools). Before a master is forwarded to the manufacturer, error correction must be performed using a dedicated program for this task. This is to ensure that the CD will be read properly when it is duplicated by the manufacturer; the error rate cannot exceed 3%.<sup>47</sup> The finalised recording is then sent from the project team, either in physical or electronic form, to the manufacturer. Upon getting approval from industry professionals, a master CD is manufactured in glass and processed and shaped through various industrial machines; this will later be used as the template to manufacture the final product. The data is etched into a CD in approximately 0.5 mm (i.e. micrometre) wide pits that are tightly packed together, so compact that it would be possible to fit 60 CD 'grooves' into a single vinyl groove. Designed to be read by a 780 nm (i.e.

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47 Owsinski, B., *The Audio Mastering Handbook*, 2nd ed. (USA: Thomson Course Technology PTR, 2008), 63, 65 and 165.

nanometre; near infrared) semiconductor laser, the CD is often coated in aluminium foil (or sometimes even gold) to enable the laser to reflect light onto the receiver more effectively. The pits are key to CD encoding: each pit edge is interpreted as 1 and each absence of pit edge is interpreted as 0. This is obviously a fragile technology so every data encoder in CD players also includes an error-correction function.<sup>48</sup>

The audio CD, then, delivers an audio data stream of 1.4112 Mbits per second ( $44,100 \text{ Hz} \times 16 \text{ bits} \times 2 \text{ channels}$  [i.e. left and right stereo channel] = 1,411,200 bits/s); note that this is only the pure audio stream, not including the sub code and channel data (these contain information about index, track numbers, etc. that I will not concern myself with here). We have now, in this third transformation, reached a high level of abstraction, where the original lute sound has been transformed multiple times into chunks of bits (i.e. 0s and 1s) delivered at a rate of 1.4112 Mbits per second.

## A brief note on recorded stereo space

The human auditory system (as represented by the outer and inner ear, the brainstem and the cortical structures associated with auditory information) localises sound by using three distinct methodologies. The first detects small differences in time between the two ears, called Interaural Time Difference (ITD); if a sound reaches the right ear slightly before the left, that sound is perceived as being located on the right side. The second method detects level differences between the two ears, i.e. variation in amplitude or sound-pressure level. This is called Interaural Level Difference (ILD). According to the ‘duplex theory’ it has been suggested that ITDs are used to localise low frequencies and ILDs are used to mentally place high frequencies. The third methodology detects variations in frequency content, or spectral cues, as caused by acoustic shadows provoked by the outer ear, or pinna, as well as the head. Each of these methods have their own designated pathway through the auditory system. Other

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48 Huber and Runstein, *Recording*, 577–579; Owsinski, *Audio Mastering*, 60–73.

contributing factors that help to localise sound are, for instance, sight and sensory detection. If one hears a sound in close proximity but one cannot see it, it probably comes from behind. Similarly, if one stands in front of a loudspeaker with one's eyes closed, one will feel the sound pressure generated by the speakers on one's body.<sup>49</sup> If a person is placed in a room together with a single sound source generating some sort of sound, we can speak of both direct sound and reflected sound reaching the ears at different times. But the situation will be quite different if we listen to recorded sound through headphones. Instead of being exposed to one signal from which we extract ITDs, ILDs and differences in frequency content, we hear two individual sources of sound that are independent of one another. If we only hear sound on the right side it is because there is no sound on the left. This is because a stereo track is not one sound source but two individual sound streams played at the same time in the respective ear. These sound streams can have different characteristics: one side may have reverberation signifying a great hall, while the other may sound like a small wooden chamber. In reality, we would hear the sound source as interacting with only one particular acoustic environment. If we play a stereo file through two loudspeakers instead of a pair of headphones, we would find ourselves in a similar situation, although it will be less obvious than through the headphones.

These situations clearly exemplify that space perception in real life is something other than it appears in music production. What appears to be an authentic space in which we perceive a source of sound may, in fact, be constructed out of several digital reverberators from competing manufacturers that all contribute to the sound production. As an example, American mixing-engineer Dave Pensado illustrates in a YouTube video how he uses three different types of digital reverbs on a single voice recording, that are panned, i.e. placed at different locations within the one sonic space.<sup>50</sup>

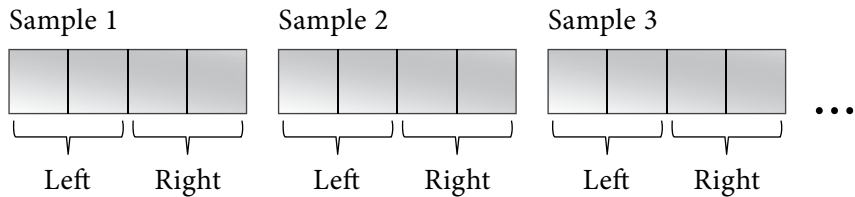
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49 Schnupp, *Auditory Neuroscience*, 177–221.

50 Pensado's Place, 'Get Great Vocal Reverbs Using Three Mono Sources - Into The Lair #84 (Pensado's Place)', YouTube video, 5'03", posted by 'Pensado's Place'. Retrieved 31 March 2014, URL: [https://www.youtube.com/watch?v=wFg\\_lAw1ROc](https://www.youtube.com/watch?v=wFg_lAw1ROc).



To give an even more technical example, consider a standard, uncompressed stereo WAV file format (44.1 kHz, 16-bit, linear PCM). In the part of the file where the actual sound data is stored, we find each sample presented chronologically (i.e. Sample 1, Sample 2, Sample 3, etc.). It is interesting to note that each sample consists of four bytes, where the first two are the sampled sound on the left side and the last two are the sound on the right side (see Fig. 6.4 below). This is called *stereo interleaved*. It is one single stream of data, 1s and 0s, that, through cyclic patterns, distributes information about the sound at a specific moment in time to every other left and right speaker. This is done at such a speed, of course, that it is not perceptible; however, there is some form of dialogue, almost poetry, inherent in this technology. It is so detached from human perception that it is truly artificial, but at the same time it is performed at such a speed that we perceive it as natural. In fact, the audio file specification of 44.1 kHz mentioned above actually means that we hear 44,100 samples chronologically played each second, each consisting of left/right designated bytes.



**Figure 6.4.** The organisation of stereo data in interleaved stereo files.

## Lute sound as transformative process

Let us review our findings. First, we may say that lute sound moves from concrete to abstract and back again. In real life, sound consists of propagating periodic pressure waves, in which the particles of matter contract and expand. In an electric circuit, the electrons behave quite differently. They do not expand and contract in the same manner as pressure waves; rather it is the voltage that forwards the sound information by altering its amplitude. (As such, it is only now that Fourier spectrums start to resemble reality more than just being a presentational system.) At a third stage, this current enters its third phase, being the digital realm. Through

a two-dimensional process (partitioned first horizontally and then described vertically), sound is being kept, processed, and communicated as os and is. Sound is now approaching its most abstract state. Following this, at the CD manufacturer, the digital sound is joined by additional data (such as channel data and sub codes) and physically coded into the disk. When the CD is put into a music player of some sort, this entire process is performed in reverse, only to reach our ears once more as sound pressure waves.

Secondly, in this pathway there are numerous possibilities for not only tone modelling, but also the appearance of direct errors in sound representation. At the microphone level, the transient response may misinterpret some high frequencies approaching it, depending on how slowly it reacts, as well as occurrences of self-noise provided by the circuit within the microphone. Self-noise is present throughout the analogue parts of the recording chain, but the electrical currents may also be subject to electromagnetic and electrostatic noise from outside the recording equipment. This includes wrongly-matched polarities (i.e. positive and negative conductors) within the equipment setup and grounding problems; at the digital level, jitter becomes a real issue as well as proper coding, decoding, and conversion; finally, moving towards the industrial press, data processing errors are often at work (this is, of course, part of the job for both manufacturers, producers and mastering engineers to minimise). These are just some of the possible errors in sound representation that we may encounter.

What, then, can we make of this? First of all, different stages of the transformation process present us with various considerations and approaches — what is problematic in one instance is not so in the next. Secondly, all stages of this modelling of lute sound consist of complex, intertextual considerations that incorporate not only maths, physics and technology as we have seen, but also aesthetics, representation and tradition. Behind the sound of the lute, as it is being heard during playback, lies numerous decisions, both intentional (by decision making during the entire recording process) and unintentional (the inner workings of technology that one has to deal with). We can present this process schematically:

vision (desired effect) —> available material (from instrument to equipment) —>  
     knowledge of how to utilise that material —>  
     the inner workings of all the equipment involved  
     (determined by manufacturer and tradition) —>  
     creative production and problem solving —>  
 dealing with unforeseen effects (such as code failure, jitter, electric noise) —>  
     verification, manufacturing and duplication —>  
     playback ≠ vision, but = finished, fixated sound

Recorded lute sound, then, appears as a dialogue between instrument, electricity and digital code — a dialogue that aims to reproduce sound true to its original, but which inevitably provides its own contributions to lute sound. The most obvious example of this is the ADC and the DAC, that break the signal into somewhat accurate pieces, only to rebuild the signal from these fragments rather than restoring it to its original. One may easily argue, and perhaps rightfully so, depending on the system employed, that the incoherencies between original and processed signal are not audible to the human ear; but the fact remains that the audio leaving the electric circuitry, or digital code, is something other than the sound originally produced by the lute. On this basis, I argue that it would be erroneous to draw a direct parallel between sound being recorded and sound being heard through a stereo, without taking into account the multifaceted process in-between. Although I have focused on the recorded CD, this same argument can be applied to other instances of music reproduction and sound reinforcement, such as live performances. When incorporating microphones in a live performance, some of the direct sound from the lute is heard while some is heard from the speakers (lute concerts rarely reach the same volume levels as rock stadium concerts). The musician, then, does not only need to consider the sound produced by their plucking of the strings on stage but also what version of their sound comes out of the speakers, blending with the acoustic timbre and reaching the audience. In the twenty-first century, then, a musician must acknowledge this dialogue between technology (whenever and however present) and instrument, in order to ensure a performance that is in line with the musician's intent.

According to my line of argument, recorded lute sound is the sum of the processes involved in its formation; it consists of multiple instances, all contributing a specific transformation. If we consider recorded lute sound as an isolated event, we can follow the evolution from generated sound into electric current; from electric current partitioned into approximated fragments described digitally; transferred from the pure digital realm into physical realisation of code imprinted on optical discs; restored into electric currents from these fragments through interpretation of digital data; reaching a stage of sound once more. This is again why I propose a term like *biology* in the title of this book, as recorded lute sound is something that evolves over time, not necessarily a fixed description of a present state. Also, these technological transformations are an active part of an aesthetic process, just as each individual part of an organism plays a significant role in what we perceive as that organism. Although I have taken the CD as my case, I think that whatever the format used for preserving a recording (or whenever technology is present in a performance), we must take into account in our evaluations (as scholars, performers or producers) the internal processes that constitute the whole — the *biology of lute sound* — rather than skipping ahead of technology and only thinking of what the musician performed, where it was recorded and how the recording sounds. We must stay critical to the entire process, both the parts that are deliberate (playing, microphones, mixing) and those that inevitably follow the process whether we like it or not (circuitry, digitalisation, errors).

Returning to the hypothesis mentioned at the beginning of this chapter, that performers can no longer consider their authenticity as detached from, or independent of, the production process, we see how the recording process presents numerous aspects to consider also in a cultural context. Lute recordings, or any other recordings for that matter, function as signifiers that are perceived by listeners, and from those signifiers they read a cultural debate: ‘This is a recording from the 1970s or 2000s,’ ‘this sounds professional or amateur,’ or perhaps, ‘this sounds like an authentic or inauthentic Baroque recording.’ By being aware of the *biology of a recording*, the performer may be permitted to gain further control of the recording as a signifier and, thus, also better communicate the initial

vision. Additionally, the scholar may be more prepared not only to differentiate between performer or performance and technology, but also to address the gradual development from one to the other, or perhaps better formulated, the dialogue between them. On a recording, recording technology takes the role as a hidden instrument, or perhaps the filter through which we perceive the music. Is it really fair, for instance, to judge a musician's tone in a recording if the microphone used to capture him or her was not, in fact, the most suitable? Perhaps what we hear is not the tone of the instrument but rather a misinterpretation made by recording equipment. Similarly, a bad tone can be improved on by adjusting frequencies and dynamics, making the instrumentalist sound better than they might do alone without any microphone. Clearly, this has become practice in much of the vocal music of more recent times, where having a microphone has become part of the vocal technique, and the singer sings in a fashion that demands a microphone in order to be heard. In such cases, recording technology has in fact become part of a musician's aesthetics. This can also be seen in the often-complex composition of technologies incorporated by the electric guitarist, used for the purpose of finding that unique sound. For the Early Music performer, then, embracing technology during the stages of planning and recording can enable more coherent and successful communicative results than a mentality that musicians should do their thing while the technicians do theirs.

# Conclusion: Approaching a concept and biology of lute sound

What can we make of it all? The discourse has passed through several perspectives throughout the book, to present the arguments which are based on the following investigative chronology (here revised):

1. Historical foundation and interpretation of the building blocks (historical research and literature studies).
2. Present practice (and practise) and the past/present discourse (literature studies, artistic research and observation).
3. The instruments at hand and their construction and function (hard sciences, e.g. mathematics and physics).
4. How social context takes part in shaping the discourse (psychology and other strands of the humanities, group focus).
5. How we use tone production, based on the social context, to self-express (psychology and other strands of the humanities, individual focus).
6. How we capture and present our tone production through technology (technology, media studies and other relevant fields of study).

## Methodological review

Clearly, it is more common to discuss the methodological review in the introduction of a book, but in this case, the methodology was in the making as part of the process of writing this book. To join academic and

artistic practices successfully is not an easy task. To be interdisciplinary and not parallel disciplinary is not always equally clear. We need to balance in-depth studies with meta-discussions, and our familiar field of study with the unfamiliar. In this book, I set out to combine an academic approach with an artistic one. The result can, in some respects, be said to have failed, as it does not include any dedicated artistic products (such as films, recordings or concerts), but this was not my original intention either. The format is the book, and therefore literature sets the natural framework for the evolving discussion. What I wished to do, however, was to present an academic argument that included artistic practice in its *modus operandi* and presented ideas and statements that had not only come about in my mind, but also through my artistic practice. It was an attempt to address some of the issues that can easily be lost when only considering the academic or the artistic alone. In Table 7.1 below, I present my process as it unveiled schematically. On the right-hand side, we have my artistic process and how my artistic ideology developed, both before and during the writing of this present book; and on the left-hand side we have my academic, literary approach, which is also reflected in

**Table 7.1.** The academic-artistic methodological structure from a biological perspective.

Biological pathway	<i>Initial idea of what tone production is</i>	
	<b>Academic pathway</b>	<b>Artistic pathway</b>
	1. Historical foundation and interpretation of the building blocks.	1. We build an expectation and understanding of tone production through perceiving others.
	2. Present practice (and practise) and the past/present discourse.	2. We learn from others how to play (tutors, lecturers, colleagues, etc.).
	3. The instruments at hand and their construction and function.	3. We gain practical experience which we use to interpret literature and sources.
	4. How social context takes part in shaping the discourse.	4. We position ourselves within the collegiate through the practice we develop.
	5. How we use tone production, based on the social context, to self-express.	5. We find our own expression, grounded in our achieved position.
	6. How we capture and present our tone production through technology.	6. We are perceived by the audience who cast their judgement on our practice.
<i>Result: Our own concept of tone production and informed play.</i>		

the order of the previous chapters. Both categories relate back and forth within each column and between the academic and artistic pathways, in a sort of algorithm or flowchart. By changing the material and process of one component, we are also changing the result. This is also why the subtitle of the book makes use of the word ‘Approaching [...]’ because, as I hope to have made clear throughout the work, tone production is not static. It is not a result or truth, but a process. It is an interdisciplinary process that must consider multiple perspectives, both artistic and academic, to reach a present state that we feel comfortable presenting to our surroundings. It is a biological process in the sense that we study a living organism through its physical structure, function, development and morphology.

## Biological perspective

One of my intentions when writing this book was to better understand lute tone production from a biological point of view and its morphological aspects. Through this understanding, we are better equipped to not only understand tone production as a phenomenon, but also to contribute to new perspectives of lute performance and place ourselves within the very process of artistic development.

We can find important traces suggesting that the idea of a tone production concept for lute instruments was rather detailed and well designed, but it received little explicit attention in historical lute instructions. This concept naturally changed over time. It would seem that the closer to the decline of the lute, the closer the ideal of tone production approached the increasingly more dominant harpsichord. And, as this shift in preference took place, we see an increase in lute instructions in which more detailed information is given, seemingly to regain knowledge and ‘proper conduct’ among contemporary lutenists. The earlier, Renaissance stages of lute tone production is less well covered in primary sources. Although paintings are numerous and detailed, we can never truly rely on them as evidence. True or not, they do convey an idea of how they wanted to mediate sound, because indeed, as we have seen through Leppert’s arguments presented in Chapter 2, visual representations of musical practice



and practise are also visual representations of sound. I used visual works of art to unveil rhetorical trends in how musicians were portrayed. From this perspective, it became evident that the concept of tone production went through a morphological process, from placing the hand close to the rose to closer to the bridge; the hand position went from nearly parallel with the strings to a high arched wrist, making the fingers more directed straight into the instrument. The body posture also changed according to the shifting ideology.

Regardless of the trends we can see, it is still not possible to know for certain and with authority what the lute sounded like. Visual works of art, literature and tablature, then as now, all lack the ability to produce sound. In this respect, it is interesting to see how much detail we find in modern lute tutors. The development of modern handbooks seems opposingly proportionate to the historical publishing. While we find very little instruction on tone production in the Renaissance, modern scholars and musicians have produced a greater quantity of instructions, while in later times where we find detailed literature (like that of Burwell and Mace), we find fewer modern contributions. There seem to be several possible reasons for this. Firstly, the valuable motivation of theorising the unknown, unfamiliar and mystical. Secondly, the Baroque lute technique's closeness to the modern Classical guitar, making it easier to deduce by logic — it is simply more familiar as a concept. Thirdly, from my personal impression there seem to be more 'Renaissance lutenists' active today than 'Baroque lutenists,' making the publishing market related to the Renaissance repertoire more lucrative (for which there are several possible reasons which I will not treat here). The trend in modern performance instruction seems to follow a certain ideological morphology:

1. 'My way of doing things.'
2. The mechanics of plucking (from which proper tone production seems to be a natural result).
3. Descriptive language to 'fill in the blanks' of what is to be achieved by the mechanical actions.

Within this structure we find two ways of relating to the primary sources:

1. The ‘this is my opinion regardless of (explicitly presented) history’ approach.
2. The ‘this is my historical stance (without necessarily problematising or openly re-contextualising to modern play)’ approach.

With such a level of detail in today’s publications (particularly those following the mechanical pathway), it is interesting to question where that knowledge comes from when it is apparently not an obvious part of the original sources. Following this, we understand that modern practice is separate from historical practice, and that they develop parallel to each other without necessarily being equally related at all times.

Despite much of modern literature’s authoritative presentation of past practices, where we easily get the impression that what is described in present instruction books is how it actually was, we are rather witnessing modern interpretations and re-contextualisation of historical sources. Often self-published in some form or other, the personalised statements and approaches presented are more or less directly transmitted from the author to the reader, following a traditional master-student pedagogical approach, i.e. the learned presents a methodology that the learner is to follow. There seems to be little room for criticism, especially within the author’s own practices, and they rather address sources that seemingly support their own approach while speaking to a certain social group. Whatever our position, we must remember that Early Modern musicians dedicated themselves to the prevailing musical tradition using the contemporary instruments at hand, while modern musicians attempt to grasp past and lost practices (in the sense that we cannot call Mouton or Corbetta to ask them what they meant), using various techniques and instruments from different countries.

What we can relate to, however, is the instruments at hand today. By moving from the instrument-centric to the external, we are better able to understand the tone production process at the level of the instrument itself, its design and maintenance, and how it interacts with the surroundings. Tone production, both seen as a physical, theoretical phenomenon and as a concept, has through physics, craftsmanship and theory now become part of an external space that is very much part of the present;

it concerns the here and now more than the past. It is a tool for musical expression in a present practice. At this level of the discourse, we are able to make a stand in the past-present, authentic-unauthentic debates; and we make that stand through the instrument we choose to use. Our craft is strongly determined by the tools and how we take care of them, develop them and change them over time.

Deciding on an instrument, string types and acoustic environment does not solve the equation. Tone production is still in the making, because such decisions take place in a social context, in a relation between group and individuals, self and other. When speaking of tone production as self-expressing, I placed it in a context emphasising the personality inherent in tone construction where we can produce an idiolectic sound quality, one that people recognise as our sound. Through phenomena such as embodiment and empathic cognitive systems (among others), tone production as a self-expressive act is not only perceived and understood by the audience, but it is also felt. Tone production cannot, therefore, be strictly something that is directly related to historical practices alone, but historical practices can be used to situate oneself within the social context the performer wishes to be judged; they can be used to position oneself within a socio-cultural construct.

Tone production can address certain social, historical or academic practices and unveil our aesthetics, identity and upbringing. It is a matter between myself and the external public self-consciousness and public self-awareness. We judge ourselves through comparison, between ourselves and our colleagues, through our own development as musicians, and through the recognition we get for our actions and who we get it from. Tone production can also function as a performative, dramatic effect to consciously or unconsciously elaborate our identities. A concept of Early Modern tone production for lutenists is, then, not only about historical practice and evidence, or who has the strongest authority within music performance, but who we are; who we want to be; who we wish to be acknowledged by; what social formations we wish to be accepted into; and so on.

This is why recording technology becomes relevant in an Early Modern discourse, because we do not only perform our music to audiences

where we have the possibility of elaborating our practice through presentation; we also record albums. When an album is released, especially digital releases where booklets are often unavailable, we are left defenceless to the judgement of the listener. The recording process therefore presents numerous aspects to consider. Through a biological understanding of a recording as part of the tone production process, the performer may be permitted to better communicate the initial intent. Recording technology is the hidden instrument, the filter through which we perceive the music. In much vocal music of more recent times, it has become practice to use a microphone as part of the vocal technique, where the singer sings in a fashion that demands a microphone in order to be heard. But much of Early Modern music has remained at a distance from the modern, electronic technology — ‘Let technicians do their thing.’ By including technological considerations in our tone production process, we can enable more coherent and successful communicative results.

## **Conceptual understanding and *post scriptum***

Clearly, there is not one true concept of Early Modern lute tone production, only competing concepts; concepts that resonate and create friction between one another, and concepts that constantly develop, mature and change. A biological understanding of the matter can help unveil and relate to this ideological, pedagogical and aesthetic flux. It is at the very nexus of this flux where informed play becomes important. Informed play is not a truth, nor a proper conduct; it is a conceptual understanding of a biological morphology that positions and presents the performer in a manner of their own choosing. From this position, the performer can shout to the world: ‘this is me and my new approach.’ They can remain undetected by conforming to already-accepted practices or any variation in-between. The point is not where the position is taken or how it actually sounds, but that an informed decision is made in which the performer feels confident with their own practice and can make an account of the ‘how, when and where’ of their personal expression. If tone production is a way to self-express, it must also preserve the self in its expression. Personally, I find this to be a true treasure for future lute performance, regardless

of where the lutenist positions themselves between social groups, academic affiliation or in questions relating to authenticity, HIP (i.e. Historically Informed Performance) or some sort of post-HIP. This is because, in a world of selfies, hashtags and life-tracking (such as pulse watches, step counters and workout log apps),<sup>1</sup> what seems to preoccupy the contemporary audience in the Western world, at least, is the personal, self-expressing and non-institutional. Changed profile pictures and photographs of a lunch in social media receives more attention and engagement than a shared, recent academic study. This is the world we currently live in and this is, in part, our audience. By reviewing the biological process of tone production and having a conceptual understanding of it to inform our self-expressive play, it can be artistically very interesting to join the public discourse and dare to ask what we have done, what we are doing and what it can possibly become. Can self-expressiveness, informed play and academic innovation not only strengthen the position of the performing artist, but also create new audiences and inspire them to invest interest in Early Modern music? I believe so, and I think informed play is a good place to start.

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<sup>1</sup> See, for instance, Jill Walker Rettberg's book on the subject: Rettberg, J.W., *Seeing Ourselves Through Technology: How We Use Selfies, Blogs and Wearable Devices to See and Shape Ourselves* (USA: Palgrave Macmillan, 2014) Kindle book.

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