QUANTITAS TEMPORALIS INTRINSECA IN THE CONTEXT OF CONTRAPUNTAL
VOCAL MUSIC

by

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To the memory of my mother, Cecilia.

To my wife and inspiration, Evelyn.

To my sweet daughter and source of hope, Vera.

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Table of Contents

List of Examples

List of Figures

Introduction

The purpose of the present work is to bring attention to the concept of *Quantitas*

temporalis intrinseca as it was introduced by Wolfgang Caspar Printz (1641–1717) at the end of

the seventeenth century. Printz's and other theorists' descriptions of *Quantitas* suggest that this

concept is central to the capacity of musical discourse to be effectively communicative, eloquent,

elegant, coherent, and organized. Simply put, *Quantitas* relates to music's potential to accomplish

the rhetorical ideal that was so important in the seventeenth and eighteenth centuries. It is rare,

however, to hear about *Quantitas* in the academic context, let alone in the rehearsal room. Even

specialists focusing in performance practice rarely appeal to the concept. The need to understand

how *Quantitas* got lost in time and failed to be passed down to the modern study of music was

part of the driving interest for this study. The reality is that even though the name of the concept

mostly disappeared from the musical vocabulary, its theoretical principles indeed came to our

present day as part of other theoretical principles, or evolved to form entirely new ideas.

It is precisely because of its connections with meter, articulation, accentuation, prosody,

rhetoric, affects, and phrasing, that it is challenging to approach the topic within the limited scope

of this study. Thus, this document focuses on providing enough context to understand its

implications and usefulness in rehearsal and performance of music of the seventeenth and

eighteenth centuries, in particular that of contrapuntal music. At the same time, I have tried to

highlight how its application goes well beyond this repertoire and can greatly benefit conductors

and performers aiming at an expressive, yet transparent and coherent delivery of more modern

works that are rhetorical in nature.

In Chapter One I focus on the way the concept of *Quantitas* was presented by some

theorists, and in certain ambiguities of such descriptions. While one could see *Quantitas* as a

concept that was not very clearly defined, the fact that there have been discrepancies in the

interpretation of its true meaning and implications indicate that it is rather a "super-concept" with

a number of potential practical consequences of slightly different nature. Several of the specific

theories on accentuation, articulation, and good taste in performance derived from *Quantitas* were

presented in instrumental treatises of the time due to the strong development of instrumental

music during the early eighteenth century. At the same time, these treatises continue to reinforce

the understanding that the right model for instrumental playing is vocal music—where *Quantitas*

has its roots. By examining these treatises, I aim to provide a broader understanding of its

implications.

In Chapter Two I discuss in more detail the linguistic origins of *Quantitas*. The profound

aesthetic shift that gave birth to the Renaissance in the fifteenth century included the humanists'

focus on the word and its expressive potential. The quantitative nature of Latin and Greek poetry

influenced the musical output of the humanists, who tried to apply these quantitative principles to

their own languages. The *Musique Mesurée à l'antique* in France was the clearest example of this

juxtaposition of quantitative linguistic principles and vernacular languages, but other languages

developed similar approaches. The complexity of the topic of the quantitative nature of Latin and

Greek is in itself a limitation for the purposes of this study. It is difficult enough to study the

classical pronunciation of Latin; tracing its evolution and state of reconstruction at the time the

humanists took it as a model for new poetic music would be at least one dissertation in and of

itself. I chose to provide a limited amount of information—without affecting the outcome of this

study—regarding syllabic length and the challenges that the humanists faced when trying to adapt

their accentual languages to the poetic flow of quantitative language. What ultimately mattered

was what those theorists considered to be the appropriate rendition of syllabic quantity in their

languages, and I show examples of this exact attempt in Marin Mersenne's *Harmonie*

Universelle. Despite the complexity of this topic, I discuss how this process resulted in a

correlation of accent and syllabic quantity, which, combined with the strict hierarchy of pulses

within the emergent bar, created the frame for Printz's definition of the concept of *Quantitas*

intrinseca.

In order to keep the present work relevant—particularly for choral conductors of the present day—I provide at the end of this chapter some examples of how the poetic flow of different text underlays can affect the flow of a melody, particularly when the texts are in different languages. Examples from Mendelssohn's choral cantata *O Haupt voll Blut und Wunden* and Schütz's *Cantate Domino* SWV 81 show how *Quantitas* can be used to shape the melodic line and provide clarity in dense, polyphonic textures through the shortening of some notes. This practice seems common among choral conductors, and is often based on personal experience or taste rather than a comprehensive theoretical frame. Indeed, the original aim of this study was a detailed exploration of this particular application of the concept: the shortening of unemphasized notes. But in the course of writing it, it seemed clear that providing the frame for the operation and application would be the necessary first step to leave the door open for future detailed examples. While *Musique Mesurée* uses different note values to match syllabic quantity, Printz explained *Quantitas* in the context of equal notes, establishing that in the end, not even equal notes are equal. This subtle musical phenomenon is in turn applicable to any vocal melody, and if one agrees with the eighteenth-century theorists that instrumental music is born of vocal music, then *Quantitas* is equally valid in instrumental music.

In Chapter Three I explore the idea that *Quantitas* became an integral part of musical discourse and remained present and applicable in the musical writing of the nineteenth and twentieth centuries. As a consequence, I propose that some of this repertoire could benefit from the same shortening of notes as described in chapter two in the context of both rehearsal and performance. I particularly reference works by composers that looked to the past in some way, like Brahms' study of Schütz, Mendelssohn's study of Bach, or Frank Martin's integration of chant in his Mass, all of which benefit from this treatment. The effects of *Quantitas*, originally confined to the boundaries of the bar-line, could also be applied to larger structures—something that was originally hinted at in Johann Philipp Kirnberger's discussions of meter in *Die Kunst Des Reinen Satzes In Der Musik*. This establishes a connection between *Quantitas* and phrasing

theory and hypermeter; the musician that understands this connection is in a better position to shape his or her performance tastefully and coherently. At the end of the chapter I offer a curious case of modern applicability of *Quantitas* in the context of expressivity in a MIDI sequencer. Studies of timing manipulations in expressive performances presented by Justin London in his book *Hearing in Time* help us reaffirm the correlation between *Quantitas* and an emotionally affected delivery of a piece.

Throughout this document I underscore the advantages of understanding *Quantitas* for modern conductors and performers. More than anything, it is a practical reality of the musical craft that can be used as a tool in preparation for performance. As one discovers with the examples presented, clarity of texture can be particularly enhanced through a careful preparation of the score that includes slight modifications of note duration according to *Quantitas*. Finally, it is also a great starting point to discuss the origins of other important musical concepts (like phrasing) in an academic context, and should be brought back from oblivion and explored as a fresh and comprehensive resource in music making.

Chapter 1: QUANTITAS INTRINSECA AND ITS HISTORICAL CONTEXT

Written notation is a dangerous thing, if you don't realize that it's a kind of stopgap. One can't write down what actually happens in music. And no one has ever invented a notation that could do it. Musical notation, ever since it was invented, about 1000 years ago, requires an instruction manual with every new generation.[1]

A survey of how *Quantitas* has been defined by both historical and modern theorists shows us that it indeed is very relevant to the work of modern choral singers and conductors. It is seldom discussed in choral rehearsals or in university-level choral seminars. It is not a part of everyday choral vocabulary, as are words like "dynamics," "phrasing," and "voice placement." However, knowledge and application of the *Quantitas* is an essential tool for the modern choral conductor. Indeed, if choral directors had a deeper awareness of *Quantitas*, its definition and history, its historical application to instrumental music, its basis in speech and poetry, and how to apply it deliberately when crafting a sung phrase, we would likely begin to see more vocal ensembles successfully achieve the elusive "cleanness" of sound and texture that seems to belong only to those few great conductors, and their lineage of disciples, who have a deep knowledge and a mastery of the practical application of *Quantitas*.

Before drawing conclusions about its usefulness in the arena of modern choral conducting, it may be helpful to disentangle the complexity of how the concept has been defined—or not defined—by the primary theorists who wrote about *Quantitas*. Several music theorists, particularly in the eighteenth century, offered their own unique definitions of *Quantitas*,

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[1] "Die Notenschrift ist eine gefährliche Sache, wenn man nicht weiss, das es eine Notlösung ist. Mann kann - das Geschehen in der Musik kann mann nicht aufschreiben. Und die Schrift die das aufzeichnet, die wurde nie erfunden. Das heisst die Notenschrift seit es sie gibt, das ist jetzt 1000 ungefähr, die hat, die braucht in jeder Generation eine Gebrauchsanweisung." Eric Schulz, Nikolaus Harnoncourt, Dorothea Röschmann, Michael Schade, Florian Boesch, and Joseph Haydn, *Making of "die Jahreszeiten": Nikolaus Harnoncourt In Rehearsal At the Salzburg Festival* ([n.p.]: Unitel, 2013).

each adding layers of ambiguity and even disagreement to the topic. The concept was first

presented by Wolfgang Caspar Printz (1641–1717) as early as 1668 in his *Compendium Musicae*

and later on in his *Phrynis Mitilenæus, Oder, Satyrischer Componist,* published in 1696.[2] It is rare

to find a study about this topic that does not make reference to Printz's description and

explanation of the phenomenon. His earlier definition in Latin translates as follows: "Quantitas

Intrinseca is the apparent length, where a note seems long, another short, although the quantitas

extrinseca [notated length] may not be similar."[3] Later on he explained the concept again, this

time in German, and added some examples to clarify the idea. At chapter VI, paragraph 7 of his

Phrynis Mitilenæus he says: "This variable duration of notes of equal length (based on their

[written] duration or value) is called Quantitas Temporalis Intrinseca, the inner duration."[4]

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[2] Many scholars have chosen to refer to Printz's mention of *Quantitas Intrinseca* in his *Phrynis Mitilenæus, Oder, Satyrischer Componist,* published in 1696, as the earliest source for the concept. The reason for this may be that in this publication Printz expanded the explanation to include examples of word settings within a bar as a means to clarify the idea. Pamela Jeanne Thompson has pointed out that the first edition of the *Satyrischer Componist* in 1676 contained the same passage as the 1696 edition. See Pamela Jeanne Thompson, "Quantitas Intrinseca and its Relationship to Articulation in Eighteenth-Century German Sources," D.M.A. thesis, (College Park, University of Maryland, 1999), 4.

[3] "Quantitas Intrinseca est quantitas temporalis adparens, quam nota alia longa videtur, brevis alia, licet sine similis quantitatis extrinsecae." Wolfgang Caspar Printz, *Compendium musicae: In quo breviter ac succinctè explicantur et traduntur omnia ea, quae ad Oden artificiosè componendam requiruntur*, (Gubena: Gruber, 1668), chapter VII, §1 (my translation).

[4] "Diese unterschiedliche Länge etlicher, der Zeit oder Währung nach, gleich-lange Noten, wird genennet *Quantitas Temporalis Intrinseca,* die innerliche Zeit-Länge." Wolfgang Caspar Printz, *Phrynis Mitilenæus, Oder, Satyrischer Componist,* (Dresden and Leipzig: J. C. Mieth and J. C. Zimmermann, 1696), 18 (my translation).
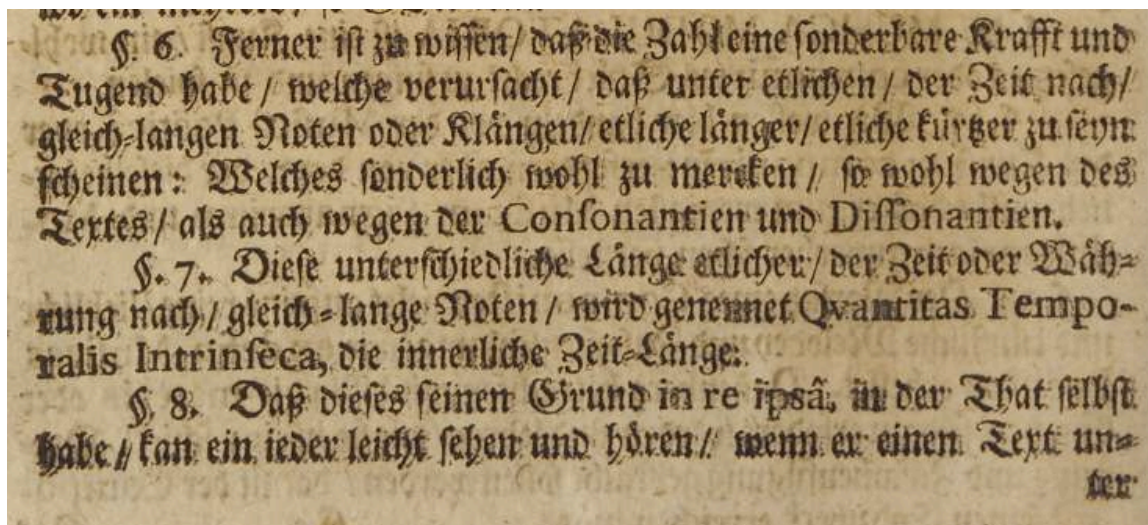
Figure 1.1. Wolfenbüttel, Herzog August Bibliothek, D-W VD17 1:648934S, Wolfgang Caspar Printz, *Phrynis Mitilenæus, Oder, Satyrischer Componist,* (Dresden and Leipzig: J. C. Mieth and J. C. Zimmermann, 1696), 18.

Here, Printz made use of a word—*Christianus*—when trying to illustrate the concept of

Quantitas Temporalis Intrinseca. By setting the word to notes of equal value he suggested that

one can naturally "see and hear" this variable duration. Printz is clearly making reference to the

differing weights of the syllables as a basis in and of itself (*in re ipsam*) to show the inner

difference of the four notes. Most importantly, Printz establishes here the connection between

spoken language and *Quantitas*. It was in its earliest definition a concept described in relation to

vocal music. Its text-based origins already suggest that it is a concept appropriate for vocal

ensembles.

Figure 1.2. Ibid., 19.

Printz influenced many early eighteenth century writers, particularly Johann Gottfried Walther (1684–1748) and Johann Mattheson (1681–1764),[5] who were among the first to further explore the definition and musical consequences of *Quantitas*. Theorists used a great variety of terms to refer to the phenomenon of inequality of notes. The concept of emphasizing certain notes while giving less importance to others was most commonly clarified through the terms *good notes* and *bad notes*, used by (among others) Francesco Geminiani (1687–1762), Georg Muffat (1653–1704), and Leopold Mozart (1719–1787). Some of the other term pairs used by German theorists included: *quantitas intrinseca / quantitas extrinseca, innerliche Geltung / äusserliche Geltung, innerlich lang / innerlich kurz, virtualiter lang / virtualiter kurz, gut / schlecht, thesis / arsis*, etc.[6]

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[5] See George J. Buelow, "Printz, Wolfgang Caspar," *Grove Music Online,* ed. Deane Root, §2.
[6] For a fuller list of terms used in German sources, see Thompson, "Quantitas Intrinseca," 58–59.

TERMS	THEORISTS
Strong/Weak	Hotteterre, Rameau, Bernier
Good/Bad	L. Mozart, Türk, Marpurg, Albrechtsberger, Tromlitz
Notae buona/Notae cattiva	L. Mozart, Walther
Accented/Unaccented	Kollman, Tans'ur, Antoniotto, Kirnberger, Burney, Callcott
Thesis/Arsis	Adlung
Stressed/Unstressed	Marpurg
Long/Short	Printz, Walther, Scheibe, Marpurg, Hiller, Koch
Notae virtualiter longue/ Notae virtualiter breves	Heinchen
Struck/Passing	Türk, Altenburg
Emphasized/Unemphasized	Grassineau
Principle/Non-principle	Quantz, Kirnberger, Altenburg, Muffat, Rameau
Heavy/Light	Türk, Wolf
Fringing	North

Figure 1.3. List of terms by various theorists.[7]

Quantitas Intrinseca refers then, in its most basic form, to a pattern of audible emphasis

in a series of notes of visually equal length. It is indeed a way of ranking notes and at the same

time a series of practical instructions for the execution of said hierarchy of notes. The concept is

as basic as it is elusive because of the ambiguity and variety of ways in which said emphasis

might be executed in performance. Some theorists believe this emphasis is done by accentuation.

According to Kirnberger (1721–1783):

> If one hears a succession of equal pulses repeated at the same time interval, […]
> experience teaches us that we immediately divide them metrically in our minds by
> arranging them in groups containing an equal number of pulses; and we do this in such a

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[7] Donald Trott, "Metric Accentuation as Applied to Selected Choral Works of W.A. Mozart," *The Choral Journal* 31, no. 9 (1991): 58.

way that we put an accent on the first pulse of each group or imagine hearing it stronger than the others.[8]

These metrical patterns of accentuation are at the same time cause and consequence of the presence of the bar-line, which began to appear in written music scores in the late sixteenth century. When Printz mentioned that *Quantitas* "is born out of a certain intrinsic virtue of the number. Thus, those numbered with an odd number are long, those with an even number are short,"[9] he was making reference to the position of the note within the bar. For Printz, therefore, the boundaries of the bar-line are what create the hierarchy of accentuation among pulses contained inside them.[10] For others, like Kirnberger, it is the opposite relationship. He believed that the appearance of the bar-lines is the result of—not the cause of—a pattern of accentuation of beats that are naturally separated into groups of two, three, or four.[11]

Accentuation is certainly not the only way to emphasize a note. Theorists also recognized alteration of the duration of a note as something that created emphasis. Georg Muffat described the French practice of *lourer,* or that of altering the length of the good notes to such an extent that created what we know as *notes inégales.* However, this calculated degree of alteration, which could range from a mild triplet to a double-dotted rhythm, might not be what German writers were imagining in their discussions of *Quantitas.*[12] In *Quantitas,* as well as in *good* and *bad notes,* the degree of alteration is subtler yet decidedly perceivable to the ear.

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[8] Johann Philipp Kirnberger, *The Art of Strict Musical Composition,* (New Haven: Yale University Press, 1982), 383.

[9] "Nascitur ex vi quadam virtuali intrinseca numeri. Itaque quae numero impari numerantur, longae, quae pari breves sunt." Printz, *Compendium musicae,* chapter VII, §2–3 (my translation).

[10] Paragraph 6 of *Phrynis Mitilenæus* (see Figure 1.1) expands the same assertion, stating that, "Further, the number [position in the measure] has a peculiar power and virtue. Some numbers cause notes or sounds of the same duration, according to the time (Zeit), to seem longer or shorter. This should be especially noted as much because of the text as because of consonance and dissonance." Printz, *Phrynis Mitilenæus,* 18, quoted in George Louis Houle, "The Musical Measure as Discussed by Theorists From 1650 to 1800" (PhD diss., Stanford University, 1961), 177.

[11] See Roger Mathew Grant, "Epistemologies of Time and Metre in the Long Eighteenth Century," *Eighteenth Century Music* 6, no. 1 (2009): 66–67.

[12] See Houle, "The Musical Measure," 180.

In his Musikalisches Lexikon of 1732 Walther included an entry for *Quantitas Notarum*

extrinseca, & intrinseca, in which he is very clear about the different length of notes according to

their position within the bar:

Figure 1.4. Quantitas Notarum extrinseca & intrinseca, in Johann Gottfried Walther,
Musikalisches Lexikon: Oder, Musikalische Bibliothek, 1732, ed. Richard Schaal (Kassel:
Bärenreiter-Verlag, 1953), 507.

> […] the apparent (or outward) and the inner value of the notes. According to the former,
> every note is performed equal to other notes of the same value, but according to the latter
> the notes are of unequal length: since, to be specific, the uneven-numbered parts of the
> beat are long and the even-numbered ones short.[13]

However, the variety of ways in which theorists describe *Quantitas* has led to some

discussions about the practical implications of the concept. In her doctoral work on the topic,

Pamela Jeanne Thompson surveyed the German sources as well as modern studies, and concluded

that "there is not a consensus among modern writers on the question of whether these words refer

to accent alone […], duration, or accent plus duration."[14]

For example, in his "Praecepta der Musicalischen Composition" from 1708 Walther

himself did not make a clear distinction between the idea of accentuation and lengthening when

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[13] Walther quoted in George Houle, *Meter In Music, 1600–1800: Performance, Perception, and
Notation* (Bloomington: Indiana University Press, 1987), 82.
[14] Thompson, "Quantitas Intrinseca," 9.

explaining *Quantitas*, and marked his examples with the long and short syllable signs typical of poetic analysis (– ∪):

> *Quantitas Intrinseca Notarum* (which is also called *Quantitas accentualis*) is the length of some notes of otherwise equal [written] value, when they are unequally arranged. That is, that one next to another of equal [written] value is now long, then short.[15]
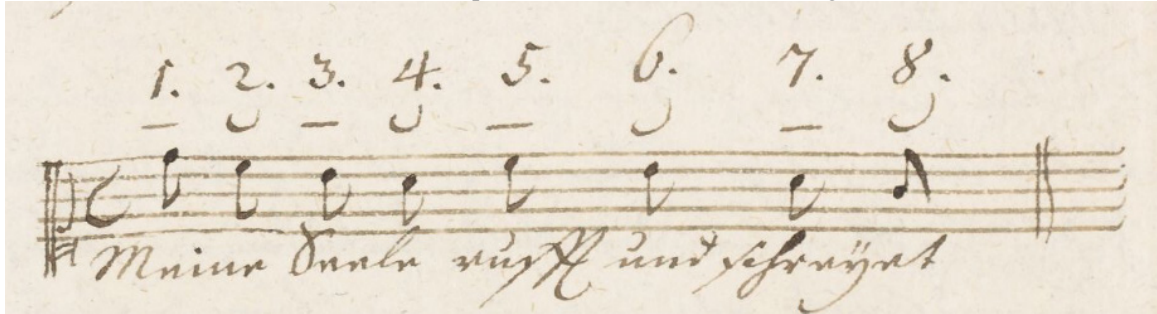
Figure 1.5. Weimar, Herzogin Anna Amalia Bibliothek, D-WRz Q 341 [c]. "Mei-ne See-le ruft und schrey-et," long and short syllables in Walther, *Praecepta Der Musicalischen Composition* (Weimar: 1708), 35, Chapter III, §25.

The use of the word "apparent" by the authors has also created a layer of confusion when trying to understand the lengthening and shortening of notes in *Quantitas*. It seems that two possible interpretations of the word—meaning on one side "illusory" (not real) and on the other more simply "the way something is perceived,"—have fueled a debate regarding whether the alteration of length actually happened or not in *Quantitas Intrinseca*. In addition, the same word was used (in the primary sources or in translations) to refer both to the difference of performance length in the notes and to the written value as well.

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[15] "*Quantitas Intrinseca Notarum* (welche auch *Quantitas accentualis* gennenet wird) ist diejenige Länge, wenn etliche dem *valore* nach sonst gleich geltende noten gantz ungleich *tractiret* werden, also, daß eine gegen die andere ihres gleichen, bald lang, bald kurtz ist." Johann Gottfried Walther and Peter Benary, *Praecepta Der Musicalischen Composition,* (Leipzig: Breitkopf & Härtel, 1955), 23 (my translation based on Thompson, "Quantitas Intrinseca," 20).
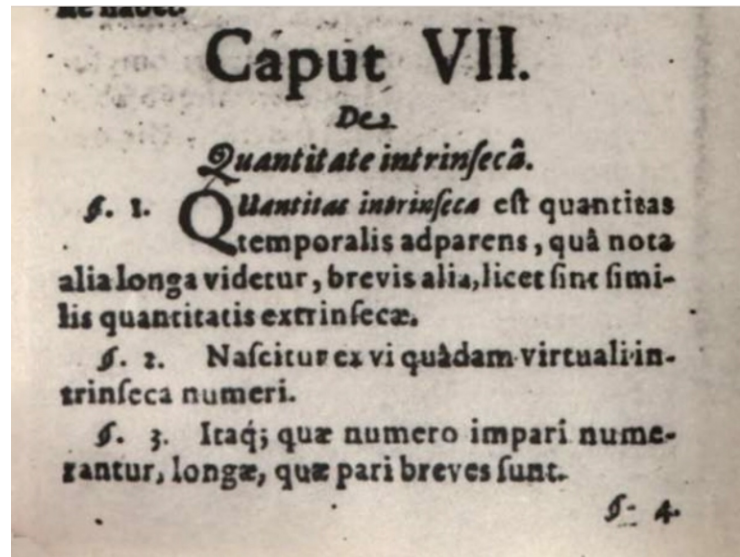
Figure 1.6. Munich, Bayerische Staatsbibliothek, D-Mbs Mus.th. 2665 am, Printz, *Compendium musicae,* chapter VII, §1–3. Printz used the word *adparens* to refer to the differing duration of notes.

It may be useful to examine several different translations used by various authors when referring to Printz's paragraph 7 in *Phrynis Mitilenæus,* in order to understand how the interpretation of these lines can suggest slightly different things. Musicologist Thomas Joel Huener refers to the paragraph in the following terms: "Printz designates this perceived difference in length "*Quantitas temporalis intrinseca"* in contrast to extrinsic, or actual duration."[16] William E. Caplin and Justin London quote Houle's presentation of the paragraph in his book "Meter in Music," which uses this wording: "The apparent different length of notes that are equal according to their time or value, is called *Quantitas Temporalis Intrinseca,* or the inner duration."[17] Could Houle—and therefore Caplin and London—be suggesting here that the difference in length is merely illusory? If we look at Houle's earlier translation in his PhD dissertation, however, we see

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[16] Thomas Joel Huener, "Wolfgang Caspar Printz' "Phrynis Mitilenaeus": A Narrative Synopsis of Musica Poetica" (PhD diss., The University of Iowa, 1989), 64.

[17] William Caplin, "Theories of Musical Rhythm in the Eighteenth and Nineteenth Centuries," chapter, in *The Cambridge History of Western Music Theory*, ed. Thomas Christensen, (The Cambridge History of Music. Cambridge: Cambridge University Press, 2002), 662; Justin London, *Hearing in Time: Psychological Aspects of Musical Meter* (Oxford: Oxford University Press, 2004), 145; Houle, *Meter In Music*, 80–81.

that he wrote: "The different lengths of notes apparently equal, according to their time or value, is called *Quantitas Temporalis Intrinseca*, or the inner duration."[18] This translation, in my opinion, better represents the wording that Printz used.

From these few examples we can see that scholars have interpreted Printz's description in various ways. We read things such as "perceived difference in length," "apparent different length," and "different lengths of notes apparently equal," effectively raising the question whether the duration of the notes was actually altered or not. It is worth noting that in this particular example from paragraph 7 of *Phrynis Mitilenæus,* Printz did not use any word meaning "apparent." That comes, as I have mentioned before, from his Latin description from *Compendium Musicae*. Rather than trying to narrow and confine the practical implications of *Quantitas Intrinseca,* it seems more productive to consider that the descriptions likely point to a combination of length and/or accent that were used in order to convey the described emphasis.

Emphasis, accent, long/short, strong/weak, good/bad, etc., though seeming contrasting or contradictory, ultimately are all terms that actually refer to the same phenomenon—*Quantitas*—whose true manifestation lays somewhere in a middle ground that combines of all these characteristics of a sound. It is indeed a gray zone in the spectrum. Understanding and validating the elongation or shortening of notes as a way to emphasize or deemphasize them*,* however, is essential for the purposes of this study. It is through this application of *Quantitas* that we can create textural clarity, relief, and shape in a musical line*.*

Quantitas Intrinseca in the Instrumental Realm.

Many theorists took particular interest in *Quantitas* from the perspective of instrumental music during the eighteenth century. This is consistent with some important aesthetic changes that were taking place in musical performance practice. This era saw the strong development of

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[18] See Houle, "The Musical Measure," 177.

the solo instrumental performances (which would culminate in the emergence of the "virtuoso"
figure in the nineteenth century). The development of the symphony and the consolidation of the
modern orchestra also took place during this time. Therefore, a lot of the discussions about
Quantitas that started in close connection to rhetoric and vocal music ended up blending with
technical instructions to perform expressively in one instrument or another.

Leopold Mozart's *Violinschule* (1756), Carl Phillip Emmanuel Bach's *Versuch über die
wahre Art das Clavier zu spielen* (1753–1762), Quantz's *On playing the flute* (1752), Muffat's
Florilegium Primum (1695) and *Secundum* (1698)[19] are among these treatises with a strong
instrumental focus. To this day we use some of the information laid out by these works in
performance, which was passed down by tradition. In Muffat's *Florilegium Secundum,* we read a
description of the origins of our modern bow markings for down-bow and up-bow in connection
to the performance of *good* and *bad* notes:

> Of all notes found in any composition, some are good, noble or *principales* and the others
> are *chetives* or *viles*. Good notes are those which seem naturally permitted to the ear as
> small reposes. These are those notes which are a little long, those which begin an
> essential part of the measure, or which have a dot after them and between their equals;
> which dot diminishes those notes which are on the odd part of the beat. Most good notes
> are played on the down bow.
>
> The *chetives* are the others, such as passing notes, which do not satisfy the ear and leave
> after themselves the desire to pass on. See examples Oo, where I have marked the good

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[19] Leopold Mozart, Jacob Andreas Fridrich, and Gottfried Eichler, *Versuch Einer Gründlichen
Violinschule,* ([first edition] Augsburg: Johann Jacob Lotter, 1756); Leopold Mozart, *A Treatise On the
Fundamental Principles of Violin Playing,* 2nd ed., translated by Editha Knocker, with a preface by Alfred
Einstein (London: Oxford University Press, 1951); Carl Philipp Emanuel Bach, *Versuch über Die Wahre
Art, Das Clavier Zu Spielen,* facsimile of the first edition: Berlin : C.F. Henning, 1753–1762, ed. Lothar
Hoffmann-Erbrecht (Leipzig: Breitkopf & Härtel, 1957); Carl Philipp Emanuel Bach, and William J.
Mitchell, *Essay On the True Art of Playing Keyboard Instruments* ([1st ed.] New York: W. W. Norton,
1949); Johann Joachim Quantz, *Versuch Einer Anweisung Die Flute Traversière Zu Spielen* (Berlin:
Johann Friedrich Voß, 1752); Johann Joachim Quantz, *On Playing the Flute,* 2nd ed., translated with notes
and an introduction by Edward R. Reilly (London: Faber and Faber, 1985); Georg Muffat, *Suavioris
Harmoniæ Instrumentalis Hyporchematicæ Florilegium Primum* (Augsburg: Jacob Koppmayr, 1695);
Georg Muffat, *Suavioris Harmoniæ Instrumentalis Hyporchematicæ Florilegium Secundum,* (Passau:
Georg Adam Höller, 1698); Georg Muffat, *Georg Muffat On Performance Practice: The Texts From
Florilegium Primum, Florilegium Secundum, and Auserlesene Instrumentalmusik: a New Translation with
Commentary,* ed. David Wilson (Bloomington: Indiana University Press, 2001).

notes by an N and the bad (*chetives*) by a V on top of each note, alluding to the latin words *nobilis* and *vilis*.[20]

Muffat compiled a series of rules for the use of the bow as it is said that he learned while studying in France under Jean-Baptiste Lully. Lully and his music were regarded as highly disciplined in the use of the bow and the rhythm, due to its close connection to the ballet style.[21] For Muffat, the main rule, upon which "all subsequent rules depend," was to use the *nobile* bow for the strong beats of the measure, and more specifically for the first beat.[22] Because of this, very often it would be necessary to take two consecutive bows in the same direction, thus producing an articulation break between the two notes (the time that it would take for the bow to leave the string and travel in the air to the frog again) which, according to Muffat, was at the center of the crisp, transparent, and rhythmic effect achieved by the Lullian orchestra, especially because it was done by every string player in a very disciplined manner.[23]

Figure 1.7. Muffat, bowing annotations demonstrating the rule of the "down-bow" in the Lully style.[24]

As we will see later, the use of breaks or *caesuras* in this way is closely connected to the grammatical pauses that are necessary to make an oral discourse intelligible. What the breaks mainly do in this case is define with clarity points of emphasis, accent, or strong rhythmical

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[20] Georg Muffat quoted in Houle, "The Musical Measure," 175.
[21] Muffat, *On Performance Practice*, 33.
[22] Ibid., 34.
[23] Today it is a given that every string player in the orchestra will move the bow in the same direction as his colleagues, but it seems that it was not the general rule in Muffat's time. See John Spitzer and Neal Zaslaw, *The Birth of the Orchestra: History of an Institution, 1650–1815* (Oxford: Oxford University Press, 2004), 371–374.
[24] Muffat, *On Performance Practice,* 40.

moments in dance music, all concepts that we have already seen related to *Quantitas*. The physicality of playing a string instrument is particularly revealing because of the correlation between the *good notes* and the down-bow. The matching between down-bow and the strong beat is not a random choice, and it comes from both the nature of violin playing and the shape of the Baroque bow. When a violinist plays down-bow, gravity is allowed to pull the arm towards the earth, producing naturally a stronger note than if the arm were acting against gravity, as in the up-bow. On the other hand, the shape and weight distribution in the Baroque bow produces a natural decay when playing from frog to tip (down-bow).[25] More importantly, when playing at the frog, the hand is closer to the contact point with the string, allowing an almost direct transmission of the weight of the arm.

This approach to the use of the bow given by Muffat in relation to the strength of the beats within a bar is confirmed many years later in the *Violinschule* of Leopold Mozart. Besides giving clear instructions about the use of the down-bow in particular for the first beat of the bar, he describes the hierarchy of beats within a bar in a manner that seems to stem from Printz's description about the "numbers" of the notes that was mentioned earlier. For Leopold, the position of the note in the bar, and even further, the position of the note within a beat, gives it a particular hierarchy next to the notes in different positions:

> The specially strong beats are as follows: In every bar, the first note of the first crotchet, the first note of the half-bar or third crotchet in 4/4 time; the first note of the first and fourth crotchets in 6/4 and 6/8 time; and the first note of the first, fourth, seventh, and tenth crotchets in 12/8 time. These may be called the strong beats on which the chief stress of the tone always falls if the composer has indicated no other expression.[26]

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[25] The evolution of the shape of the bow during the late eighteenth and early nineteenth centuries allowed a more sustained sound at the tip and an easier production of a *good* note when playing up-bow. In other words, it homogenized the bow. See David D. Boyden, *The History of Violin Playing, From Its Origins to 1761 and Its Relationship to the Violin and Violin Music* (London: Oxford University Press, 1965), 157–158, 206–210, 253–258.

[26] Mozart, *A Treatise,* 219.

Figure 1.8. Leopold Mozart's instructions on down-bows.[27]

While all of the preceding information about string playing may at the surface seem unconnected to choral music, it is precisely this detailed study of *Quantitas* that has been missing from instructions for vocal ensembles. How is a voice different from a violin? A voice functions much more like an organ. It needs no separate mechanism (like a bow) to start and stop its sound. It needs only air flowing and vocal cords vibrating. Furthermore, modern vocal ensembles are typically much larger than in the seventeenth and eighteenth centuries. With several voices singing the same part, a note or phrase can be extended *ad infinitum*, with each singer silently and discreetly breathing when needed. The result is that there is nothing that naturally suggests stops and starts (aside from the rests, of course), lengthening or shortening in choral singing. But by applying to a group of voices the principles of *Quantitas* as we have now seen them applied to string bowing, the choir achieves a cleaning of texture and a strong sense of togetherness.

It may be easier to connect this kind of instructions to vocal singing by observing theorists writing for an instrument more related to the voice. Wind instruments, unlike strings, do naturally mimic the voice in their sound production. They are essentially a pipe with a resonating chamber and a point of vibration. The flute player uses the breath to create the sound and the tongue to create variation of articulation, just like the singer. Johann Joachim Quantz wrote his treatise *On Playing the Flute* around the same time as Leopold Mozart, in the middle of the eighteenth century. When looking at his technical explanations it is easy to perceive their close

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[27] Notice the similarity with the Lullian bowings mentioned by Muffat. Mozart et al., *Versuch,* 71.

connections to speech and rhetoric. One therefore sees more clearly how *Quantitas* can and should be applied to a sung line of text.

Quantz discusses *Quantitas* and reiterates the importance of knowing the right hierarchy of notes when playing a melody:

> You must know how to make a distinction in execution between the *principal notes*, ordinarily called *accented* or in the Italian manner, *good* notes, and those that *pass*, which some foreigners call *bad* notes. Where it is possible, the principal notes must always be emphasized more than the passing.[28]

In addition, he provides the flute player with a series of tonguing examples that give the right articulation, weight and fluidity to a melodic line. This is particularly interesting as a non-rhetorical use of linguistic resources (syllables) applied to a musical line with the goal of achieving in performance a similar type of contrast and shape as in speech.

Figure 1.9. Quantz's use of the articulation of the syllables *did'll di* as double-tonguing examples.[29]

Figure 1.10. Quantz's use of different combinations of syllables in tonguing to achieve distinct articulation.[30]

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[28] Quantz, *On Playing the Flute*, 123.
[29] Quantz, *Versuch*, table IV, fig. 3.
[30] Ibid., fig. 20.

Indeed, Quantz takes advantage of the phonetic characteristics of certain consonants (in this case *d, d'll* and *t*) to produce different levels of breaks in between the notes. Since the traverso doesn't have a very big dynamic range, articulation becomes crucial in order to convey a sense of emphasis in the musical line.

Keyboard playing also relies on the use of articulation as a means to provide shape and emphasis to the melodic line, especially when the harpsichord and the organ are concerned, where it is not possible to change the dynamic except for changes of registration. Even the fortepiano, which started to appear by the mid eighteenth century, had a limited dynamic range compared to the modern piano. Keyboardists of the time refer to the "ordinary touch," "ordinary fashion," or "ordinary manner,"[31] which Marpurg describes as "opposed to both slurring and detaching, in that, shortly before one touches the following note, one quite swiftly lifts up the finger from the preceding key."[32] According to Robert Donington, in this particular type of playing of unmarked notes "circumstances vary enormously; but we have the general impression of a very easy flow of sound, with no abrupt silence between the notes, yet with a certain distinctness."[33] This creates a basic canvas upon which variations of articulation would be easy to distinguish and interpret as emphasis or lack of emphasis. For example, Türk says that "if there are some notes intermingled which should be held out for their full value, the *ten.* or *tenuto* is written over them."[34]

By this time keyboard playing had become very sophisticated and highly demanding technically. But the search to match rhetorical delivery, and particularly alternation of emphasis, had been going on for a long time in instrumental technique. Girolamo Diruta used the terms *good* and *bad* to explain fingerings for keyboard performance already in 1625.[35]

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[31] Marpurg, Türk, C. P. E. Bach, among others describe this practice. See Thompson, "Quantitas Intrinseca," 125–132.
[32] Ibid., 137.
[33] Ibid., 130.
[34] Ibid., 141.
[35] See Houle, "The Musical Measure," 176.

What can choral directors gain from these instructions for keyboard playing? Unlike a historical keyboard, singers are not limited in their range of dynamics. In fact, dynamics is often the first instruction given to singers in order to create "shape." It need not nor should it be the first instruction. A crafting of the inner shapes and texture of a single line according to each note's *Quantitas*, as well as to the text that accompanies the musical line, is a far more detailed and interesting treatment of a vocal line than a simple crescendo-decrescendo. In fact, there are many circumstances in which a raising or lowering of dynamic range is not desirable within a single voice of a choral texture. These keyboard instructions, therefore, can provide practical understanding of how to craft an intricate and texture-rich shape of a single vocal line of text.

The theorists themselves also drew connections between the instruments they wrote about and speech, and there was a deliberate effort to provide instrumental music with as many expressive resources available in order to make it keep its oratorical roots alive. Mattheson insisted repeatedly in *Der Volkommene Capellmeister* in the idea that instrumental music comes from vocal music, and that it should clearly try to imitate it in as many ways as possible. For him,

> The first distinction, of seventeen, between a vocal and instrumental melody consists accordingly in the fact that the former is, so to speak, the mother and the latter, her daughter […] just as the mother must necessarily be older than her natural daughter, so also the vocal melody undoubtedly existed earlier in this underworld than did instrumental music.[36]

> Because the proper goal of all melody can be nothing other than a thing pleasing to the hearing through which the passions of the soul are stirred, it still cannot be attained by one who is not aiming at it, who feels no emotion, and who scarcely thinks of any passions unless it is one which can be felt deeply and involuntarily. However, if he is stirred in a more noble way and wants to move others with his harmony, he must know how to express sincerely and without words all the emotions of the heart through selected sounds and their skillful combination in such a was that the auditor might fully grasp and clearly understand therefrom, *as if it were an actual speech*, the impetus, the sense, the meaning, and the expression as well as all the pertaining divisions and caesuras. It is then

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[36] Ernest Charles Harriss, "Johann Mattheson's 'Der Vollkommene Capellmeister': A Translation and Commentary" (PhD diss., Peabody College for Teachers of Vanderbilt University, 1969), 662. See also Johann Mattheson, *Der Vollkommene Capellmeister* (Hamburg: Christian Herold, 1739), and Johann Mattheson, *Der Vollkommene Capellmeister,* ed. Friederike Ramm (Kassel: Bärenreiter, 1999).

a joy! Much more art and a stronger imagination is required if one wants to achieve this *without rather than with words*.[37]

Printz, Walther, Mattheson, and other theorists discussing *Quantitas Intrinseca* were putting in writing the basis for what they understood to be a natural rule—the evident inequality of the sonorous elements of speech applied to music. With his very explicit approach to music as speech, Mattheson added another layer to this approach by utilizing the different *caesuras* that exist in a text. For him, acknowledging punctuation in a musical discourse was quintessential to the intelligibility of the delivery. Clarity should not be compromised at any point, and therefore the subtleties of articulation had to be implemented when playing:

> All long as well as short instrumental melodies must have their proper *Commata, Cola,* periods, etc., in the very same way as the song with the human voice. Otherwise, it is impossible to find a clearness therein.[38]

This is so important for Mattheson that he considers that someone writing music in a language that is foreign to him must not only understand the language well, but also understand the right prosody, in order to not violate the rules of accentuation, the commas, etc. Otherwise the result would be nothing else but "beautiful rubbish."[39]

Printz also offers his own version of a very obvious instruction on how to avoid such "beautiful rubbish." In vocal music, according to the correct practice of *Quantitas Intrinseca,* the accented syllables of the words must coincide with the long beats of the bar for it to be rendered correctly. Printz made this very clear with his example of two different settings of the word *Christianus*, one in correct alignment with the *Quantitas Intrinseca* of each beat, and the other in an incorrect alignment:

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[37] Harriss, "Johann Mattheson's," 673 (my italics).
[38] Ibid., 503.
[39] Ibid., 381.

Figure 1.11. Wolfenbüttel, Herzog August Bibliothek, Wolfgang Caspar Printz, *Phrynis Mitilenæus, Oder, Satyrischer Componist,* (Dresden and Leipzig: J. C. Mieth and J. C. Zimmermann, 1696), 19. Correct alignment of the syllables according to *Quantitas Intrinseca.*

Figure 1.12. Ibid. Incorrect alignment of the syllables according to *Quantitas Intrinseca.*

All of these examples from past theorists provide modern vocal ensembles with tools for creating textural clarity within a vocal line. It is precisely through the understanding of these principles of elongation or shortening of the notes in relation to the text that some very fine conductors have developed a systematic approach to creating clarity of texture. They have been able to integrate the *caesuras* mentioned by Mattheson in order to achieve this. Some of the work is certainly done in advance by the composer, because the larger *caesuras,* like the periods that mark the end of a sentence, would normally coincide with the end of a phrase, at which point a breath would naturally occur.

Thomas Dunn realized that, for the modern singer, it is not always evident through the writing of the composer when to recede from the sound to clarify the texture. In order to facilitate the process, Dunn decided that the best resource was to mark the singers' scores not only with

breathing marks, but also to change some note values to shorter ones for clarity purposes.

Understanding the close relation between text and phrasing, he would also mark instrumental

parts according to the text sung by the choir:

> The chorus must know not only dynamics and articulation, but also where to breathe and
> information about the diction. For the orchestra, I give bowings for the string players that,
> in a choral/orchestral work, match the phrasing the chorus is singing. That phrasing is
> often determined by the text. Which is information the string players wouldn't have
> unless I wrote it in their parts.[40]

This practice was particularly useful during a time in which renewed interest in

performing Renaissance and Baroque music arose, along with a renewed respect of musical

criteria that had been abandoned during the nineteenth century. With reinstated focus on rhetoric

and articulation, many of the Romantic-era concerns about volume, power of sound, or size of the

ensemble became secondary in order to favor lightness, diction, affect, cleanness, transparency,

and pure intonation. In order to elicit these qualities from his choirs, Thomas Dunn had a very

strong philosophy of annotating the performer's part. He said:

> Of course, as a conductor, in my own performances of early music, I was a very specific
> "part marker."… Ivor Jones, one of my teachers at the Peabody, said that you know a
> piece only after you have made a decision about every note. Marking the parts means
> writing indications for dynamics, articulation, phrasing, and any other information the
> players and singers need to perform their parts in a unified, precise way. *It may mean
> shortening notes to provide clarity*, adjusting dynamics to emphasize one part over
> another, or even something as simple as indicating the conducting patterns to be beaten.[41]

Those who were lucky to work closely with Thomas Dunn, or Robert Shaw, or many

other great conductors, may have developed a deep understanding of their rehearsal techniques

and those techniques' effectiveness, but many conductors face the sometimes daunting challenge

of cleaning the sound of a large choir without a systematic approach that can trace its origins to

speech. In the following chapter, I will analyze some concrete examples of the choral literature to

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[40] Tom Hall, "Thomas Dunn at 75: Reflections on a Varied Career." *The Choral Journal* 42, no. 3 (2001): 30.
[41] Ibid., emphasis mine.

show the challenges they present and the advantages of considering the principles of *Quantitas* in

the process of preparation for performance.

Chapter 2: QUANTITAS AND THE WORD

What a bottomless ocean we still have before us merely in the expression of words and the affects in music. And how delighted is our ear, if we perceive in a well-written church composition or other music how a skilled composer has attempted here and there to move the emotions of an audience through his refined and text-related musical expression, and in this way successfully finds the true purpose of music.[1]

The literary roots of the *Quantitas* can be traced to the Renaissance humanists and their particular interest in the unification of the poetic and the musical arts. Theorists like Zarlino, Gaffurius, Glareanus, Galilei, Salinas, and Mersenne, among many others,[2] studied texts of classical antiquity in order to understand the nature of the musical art in this time period. Their goal was to restore music to what they considered to be a more perfect state. As a result of this, an aesthetic change took place during the Renaissance, driven by the newly-understood principle that the ancient Greeks considered music and poetry to be one unified art. As Zarlino states in his *Istitutioni Harmoniche*: "the Musician was not separated from the Poet, nor the Poet from the Musician."[3] Renaissance humanists aimed to bring the principles governing poetry and music in classical antiquity into practice.[4]

In the scholastic philosophy, music had been part of the numerical disciplines of the *quadrivium,* together with arithmetic, geometry, and astronomy. From the fifteenth century, however, the influence of the humanists produced a shift, and emphasis on human communication became more prominent. Instead of focusing on the speculative abstractions of

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[1] Johann David Heinichen, *Der General-Bass in der Composition* (Dresden, 1728), 24, quoted in Dietrich Bartel, *Musica Poetica: Musical-Rhetorical Figures In German Baroque Music* (Lincoln: University of Nebraska Press, 1997), 52–53.

[2] See D. P. Walker, "Musical Humanism in the 16th and Early 17th Centuries," *The Music Review* 2 (1941): 4.

[3] "Il Musico non era separato del Poeta, né il Poeta dal Musico." Zarlino quoted in Walker, "Musical Humanism," 6 (my translation).

[4] See Walker, "Musical Humanism," 4–8.

musica theoretica, which reflected the numerical relations and proportions of the universe, the linguistic disciplines of the *trivium* were more strongly emphasized.[5] The true and faithful expression of the text became the most important goal of "musical humanism,"[6] and according to D. P. Walker, it resulted in "an attempt to ensure in a song three things: the vivid expression of the sense of the text; the preservation of its rhythm; its audibility."[7] More recent scholars like Gary Tomlinson or James Haar have approached this issue from new perspectives. Tomlinson discusses a number of "paradigms of humanism" advanced by music historians over the last century and a half, among which he mentions "Rhetorical Humanism" and "Ordinary-Language Humanism"—the first with its focus in the verbal arts of the trivium and oratory, and the second dealing with the "pragmatics of discourse" and the affective powers of music.[8] Haar talks about the "rhetoricizing of music" in the Renaissance clarifying that "Medieval music is of course not without rhetorical qualities," and pointing out as well how popular song may have had a stronger influence than previously granted in the emphasis put in declamatory settings of music.[9] Nevertheless, Tomlinson agrees that Walker's essays have been "pathbreaking" in their discussions of the impact of the imitation of ancient musical practice on late-Renaissance.[10]

We can relate all the musical experiments and developments of this time to one of the three points mentioned above by Walker. For instance, the appearance of the doctrine of the affections is directly connected to "the vivid expression of the sense of the text," since a sad text or a joyful text would influence the composer's choice of rhythms, intervals, tonality or modality, tempo, etc. The same can be said of other rhetorical devices such as word-painting, through

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[5] See Bartel, *Musica Poetica*, 18–21.
[6] George Houle says that "D. P. Walker uses the term "musical humanism" to refer to artistic experiments in the late sixteenth and early seventeenth centuries that were intended to re-create ancient musical theory and practice. George Houle, *Meter In Music, 1600–1800: Performance, Perception, and Notation* (Bloomington: Indiana University Press, 1987), 63.
[7] Walker, "Musical Humanism," 289.
[8] See Gary Tomlinson, "Renaissance Humanism and Music," in *European Music 1520–1640*, ed. James Haar, (Woodbridge, UK: Boydell Press, 2006), 1–19.
[9] James Haar, "The Concept of the Renaissance," in *European Music 1520–1640*, ed. James Haar (Woodbridge, UK: Boydell Press, 2006), 29–30.
[10] Tomlinson, "Renaissance Humanism," 5.

which specific aspects of the text are depicted in musical gestures, like ascension into heaven with an ascending scale, for example. Let us now consider the "audibility" of the text, also mentioned by Walker. The concern for properly hearing the text being sung resulted primarily in a shift from polyphonic texture to monody, which was believed to be the way Greek music-poetry was delivered.[11] Polyphony had achieved a very high degree of complexity, particularly in the mathematical intricacies of the *ars subtilior*. This complexity significantly obscured the intelligibility of the text, due to the multiple entrances and overlapping of independent melodic lines. Another solution to this problem was to switch to a homophonic texture, in which all the voices sang the same text at the same time.[12]

The remaining point mentioned by Walker, that is, the need to ensure the preservation of the rhythm of the text, is not as self-explanatory as the other two. What exactly is the rhythm of the text? The ambiguity of this concept may explain why this point is not often explored as much in depth as the other two.[13] However, it should not be considered of less importance. In fact, it is precisely this preservation of the rhythm of the text that is most closely related to *Quantitas Intrinseca*.

Humanists paid very special attention to the rhythmic organization of classical poetry. In particular, the Odes of Horace or Virgil's *Aeneid* were often studied as models in the Renaissance. Joseph A. Dane explains that "Classical Greek and Latin verse is quantitative, that

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[11] Walker warns that "at this period direct imitation of Greek music was impossible; for only one of the few texts we now have had been discovered and this had not been transcribed. But the references to music in classical literature were abundant and revealing enough for the humanists to form a conception of ancient music that was sufficiently clear and complete to be imitated by sixteenth century composers." Walker, "Musical Humanism," 2.

[12] The topic of "audibility" or "intelligibility" was of particular importance during the discussions of the Council of Trent regarding sacred music. The appearance of homophonic hymnody, particularly in the protestant churches, also coincides with the aesthetic changes of this time.

[13] The *affektenlehre* and textural changes that favored monody were some of the most transformative ideas that culminated in the emergence of opera and thus the Baroque period, and are often at the center of the studies in music history regarding the Baroque period.

is, it is dominated by and organized according to distinctions between long and short syllables."[14]

This distinction is crucial to understanding how a particular arrangement of different syllable-lengths in the words of a verse would produce a certain rhythmic flow that is characteristic of poetic language as opposed to mere prose. That arrangement is what we call the *meter* of the verse.

One of the most relevant attempts to compose music based on Horatian verse, and which incorporated these principles, was produced by Petrus Tritonius in 1507. He published a four-part homophonic setting of 19 odes by Horace, faithfully reflecting the meter of the verse through the use of *brevis* and *semibrevis*.[15]

Figure 2.1. Scansion of "*Iam Satis*," Horatian Carmine I, 2[16]

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[14] Joseph A. Dane, *The Long and the Short of it: A Practical Guide to European Versification Systems* (Notre Dame, Ind.: University of Notre Dame Press, 2010), 16.

[15] See Peter Bergquist and Stephen Keyl, "Tritonius, Petrus," *Grove Music Online,* ed. Deane Root, accessed January 16, 2019, https://www-oxfordmusiconline-com.proxyiub.uits.iu.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000028405.

[16] Édith Weber, "La musique "mesurée à l'antique" en Allemagne: apport à la prosodie verbale et musicale," in *Musik Des Mittelalters Und Der Renaissance: Festschrift Klaus-Jürgen Sachs Zum 80. Geburtstag*, ed. Rainer Kleinertz, Christoph Flamm, and Wolf Frobenius (Hildesheim: Olms, 2010), 485.

Figure 2.2. Munich, Bayerische Staatsbibliothek, D-Mbs VD16 M 4465, fol. 137v–138r. Petrus Tritonius, *Melopoiae Sive Harmoniae Tetracenticae,* 1507. Horatian Carmina I, 1 and 2, "Moecenas atavis" and "Iam satis terris.*"*[17]

[17] Petrus Tritonius and Konrad Celtis, *Melopoiae Sive Harmoniae Tetracenticae super xxii genera carminum Heroicoru[m] Elegiacoru[m] Lyricorum & ecclesiasticoru[m] hymnoru[m]* (Augusta vindelicorum, 1507), fol. 137v–138r, accessed March 22, 2019, http://daten.digitale-sammlungen.de/bsb00007322/image_10, http://daten.digitale-sammlungen.de/bsb00007322/image_11.

SECUNDUM GENUS

Secundum genus est dicolon tetrastrophon. Primi tres versus sunt dactylici pentametri sapphici: constant enim trochaeo, spondaeo, dactylo et duobus trochaeis. Quartus adonius, canstans dactylico dimetro catalectico, hoc est dactylo et spondaeo sive trochaeo.

Example 2.1. Petrus Tritonius' setting of Horatius' "*Iam Satis*."[18]

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[18] Petrus Tritonius, *Melopoiae Sive Harmoniae Tetracenticae: 1507,* ed. Giuseppe Vecchi (Bologna: A.M.I.S., 1967), tav. II.

As Édith Weber points out, Tritonius advocated for a faithful reproduction of the quantity of the syllables in music with the aim of achieving a more intelligible perception of the text.[19] For the Renaissance composers, text intelligibility was therefore not only related to the texture of the piece as we have mentioned before, but also to a proper declamation of its rhythm, of its syllabic "quantity." I consider that this is what Walker was referring to when talking about "the preservation of the rhythm of the text," which in itself produces a particular musical flow or shape, as we can see in Tritonius' settings. In the words of James Haar, this "new relationship of word and tone, [is] in part a formal adjustment of melodic and rhythmic values to quasi-declamatory speech patterns."[20]

Units of a small number of either short or long syllables formed what was called a rhythmical *foot*, and a certain number of these *feet* would constitute a poetic verse. The six most important rhythmical feet were *Iambic* (short-long), *trochaic* (long-short), *dactylic* (long-short-short), *anapestic* (short-short-long), *spondaic* (long-long), and *tribrachic* (short-short-short). These were, however, not the only feet recognized, as we can see in a more exhaustive list provided by Marin Mersenne in his *Harmonie Universelle*:

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[19] Weber, "La musique "mesurée"," 485.
[20] Haar, "The Concept of the Renaissance," 27.
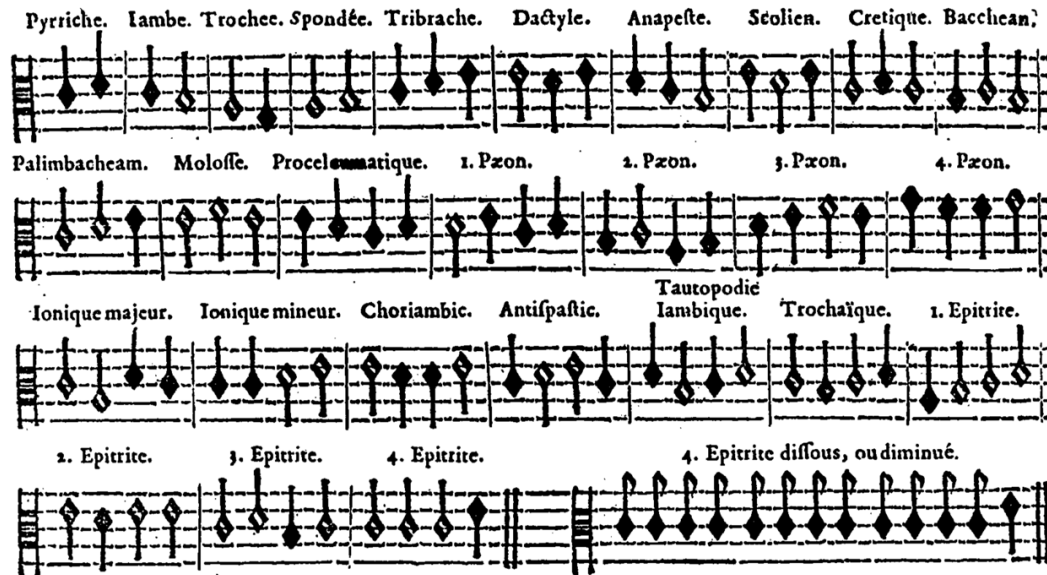
Figure 2.3. Paris, Bibliothèque Nationale de France, F-Pnlr RES-V-588 (2), 376, Marin Mersenne, Table of rhythmic feet in *Harmonie Universelle*, 1636.[21]

Since Latin grammar was an important area of study for the Humanists, they would have been very adept not only at identifying the length of the syllables of a text but also the different rhythmic feet that constituted a verse or a phrase. The practice of identifying these underlying feet was called *rhythmopoeia*.

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[21] Marin Mersenne, *Harmonie Vniverselle: Contenant La Theorie Et La Pratiqve De La Mvsiqve, Où Il Est Traité De La Nature Des Sons & Des Mouuemens, Des Consonances, Des Dissonances, Des Genres, Des Modes, De La Composition, De La Voix, Des Chants & De Toutes Sortes D'instrumens Harmoniques,* Livre sixiesme de L'art de Bien Chanter, Quatrième Partie De la Rythmique, ou des mouuemens mesurez, de la Prosodie, et de la Metrique (Paris: S. Cramoisy and P. Ballard, 1636–37), 376, accessed March 22, 2019, https://gallica.bnf.fr/ark:/12148/bpt6k54710466.

According to Houle, the study of *rhythmopoeia* "translates quantitative poetic meters into their equivalents in music."[22] In Mersenne's table above, he calls them "metrical feet" or "rhythmic movements,"[23] which is a term he uses in his following definition of *rhythmopoeia*:

> The art of arranging the movements, which Greeks call *rhythmopoeia*, consists in knowing or choosing the feet or the meters, and the verses that are appropriate for expressing the passions, or the other things that is one's purpose, and which can be represented by the movement.[24]

In this definition, we notice that there is a certain influence of the concept of "rhetorical figure," since it refers to the affective qualities of certain feet or movements and how the listener would perceive them. The idea behind *rhythmopoeia* is that it doesn't function only as an analytical tool to decipher the organization of the rhythmic feet in a text or its musical setting, but that it also serves as a creative and compositional toolbox for the composer to use in his settings. The more familiar a composer was with a large variety of rhythmic feet and the practice of *rhythmopoeia*, the better his or her ability to organize and give variety to his compositions when setting a text to music.

Humanist composers made a deliberate effort to match and adapt the flow of their own languages according to the models of Greek and Latin poets. This led to a type of musical setting that is known as *musique mesurée à l'antique,* which developed particularly in France. Jean-Antoine de Baïf together with Thibault de Courville founded already in 1570 the Académie de Poésie et de Musique in Paris to promote this union of poetry and music.[25] In the seventeenth

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[22] Houle, *Meter In Music*, 62.

[23] Today we still call a "motive" an arrangement of a small number of notes and rhythms that stands as a semantic unit.

[24] "l'Art d'arranger les mouvements, que les Grecs appellent *rythmopoeia,* consiste à connoistre et à choisir les pieds ou les metres, et les vers qui sont propres pour exprimer les passions, ou les autres choses que l'on se propose, et qui peuvent estre representées par le mouvement." Mersenne, *Harmonie Vniverselle*, Livre sixiesme, Quatrième Partie, Proposition XXVI, 401 (my translation).

[25] See Howard Mayer Brown and Richard Freedman, "Vers mesurés, vers mesurés à l'antique," *Grove Music Online,* ed. Deane Root, accessed September 29, 2019, https://www-oxfordmusiconline-com.proxyiub.uits.iu.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000029243.

century, Marin Mersenne was one of the main theorists of *musique mesurée.* In his *Harmonie Universelle*, Mersenne dedicates several sections to the discussion of Latin poetry and the ways the meter can be applied to French texts. He discusses in detail the *quantity* of the syllables (their long or short nature) and provides several examples of scansion in Latin, Greek and French.

Figure 2.4. Scansion of the opening line of Virgil's *Aeneid.*[26]

Figure 2.5. French verse in Dactylic Hexameter in Mersennes's *Harmonie Universelle*, following the model of the opening of Virgil's *Aeneid.*[27]

Even though composers like Tritonius used the ratio 2:1 for long and short notes, later on composers started using more varied rhythmic patterns while still reflecting the overall long and short quantities of the text:

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[26] Dane, *The Long and the Short,* 21.
[27] Mersenne, *Harmonie Vniverselle*, Livre sixiesme, Quatrième Partie, Proposition XX, 385.

I'en mets donc icy vn échantillon, qui pourra estre imité par ceux qui sont bien aises d'oüir les vers des Poëtes anciens mis en Musique, si ce n'est qu'ils ayent vn genie assez heureux pour encherir par dessus: il sera aisé aux Compositeurs d'Airs de remarquer à quelle de leurs mesures elle se rapporte.

Premiere Ode du troisiesme liure d'Horace.

O Di prophanum vulgus & arceo. Fauete linguis: carmina non priùs Audita,

Musarum sacerdos, Virginibus, puerisque canto. Regum timendorum in

proprios greges, Reges in ipsos imperium est jouis Clari, giganteo trium-

pho, Cuncta supercilio mouentis.

Figure 2.6. Musical setting of a Horatian Ode with mixed rhythms measured according to syllabic quantity.[28]

It is worth looking at some of the titles of Mersenne's propositions in his *Harmonie Universelle* that are relevant to us because of his focus on rhythm, syllabic quantity, and other subjects related to the emergence of *musique mesurée*. Just reading the titles can give an idea of how important he considered this topic and how much he explored it in detail. Here are a small number of examples:

> PROPOSITION XIX. *To determine all the French syllables that are long, short, or doubtful, and give the rules for this subject: and as a consequence to establish French prosody*. Since the quantity or the duration of our syllables does not follow the measure of the Latin syllables […] it is necessary to measure our quantities by the true pronunciation, and by the French accent.[29]

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[28] Ibid., Proposition XXIII, 395.

[29] "Determiner toutes les syllabes Françoises qui sont longues, brieues, ou douteuses, et donner des regles pour ce suiet: et par consequent establir la Prosodie Françoise. Pvisque la quantité ou le temps de nos syllabes ne suit pas la mesure des syllabes Latines […] il faut mesurer nos quantitez para la vraye prononciation, et par l'accent François. Ibid., Proposition XIX, 381 (my translation).

PROPOSITION XX. *To explain all which belongs to metric feet, and to measured verse, and particularly to the Hexameter, Pentameter and Sapphique.*[30]

PROPOSITION XXIII. *To explain the attempts that we have produced in this century in order to establish the prosody, and the French metric poetry, in favor of music.*[31]

PROPOSITION XXVI. *To explain* Rhythmopoeia, *or the art of making beautiful movements on all kinds of subjects.*[32]

PROPOSITION XXVII. *To give examples of all kinds of rhythmic movements of the ancients, that is of their verse: to show the movements and the metric feet of our rhymed verse, and explain the art of finding them in all kinds of words, both French and Latin.*[33]

PROPOSITION XXIX. *To explain the way of singing the odes of Pindar and Horace, and how to render French verses just as suitable for music, as are those of Pindar and other poets.*[34]

As we have mentioned above, the pursuit of *musique mesurée à l'antique* was a phenomenon that happened not only in France, but in other countries as well. Each language, however, has its own natural rhythm and flow. This brought particular challenges when trying to match them to the rhythm and flow of Greek and Latin poetry. Since the concept of *Quantitas intrinseca* finds itself at the crossroads of many of these challenges, it is worth considering them briefly here.

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[30] "Expliquer tout ce qui appartient aux pieds Metriques, et aux vers mesurez, et particulierement à l'Exametre, au Pentametre, et au Saphique." Ibid., Proposition XX, 384 (my translation).

[31] "Expliquer les essais que l'on produit en ce siecle pour establir la Prosodie, et la Poësie Metrique Françoise, en faueur de la Musique." Ibid., Proposition XXIII, 393 (my translation).

[32] "Expliquer la Rythmopoëie, ou l'Art de faire de beaux mouuemens sur toutes sortes de suiets." Ibid., Proposition XXVI, 401 (my translation).

[33] "Donner des exemples de toutes les sortes de mouuemens Rythmiques des anciens, c'est à dire de leurs vers: monstrer les mouuemens et les pieds metriques de nos vers rimez, et expliquer l'Art de les trouuer en toutes sortes de paroles tant Françoises que Latines." Ibid., Proposition XXVII, 406 (my translation).

[34] "Expliquer la maniere de chanter les Odes de Pindare et d'Horace, et le moyen de render les vers François aussi propres pour la Musique, comme sont ceux de Pindare et des autres Poëtes." Ibid., Proposition XXIX, 415 (my translation).

In classical Latin, word accentuation and syllable quantity were independent from each other, that is, the accented syllable in a word could either be a short syllable or a long one.[35] Ancient speakers could "hear" the length of syllables, but the way of speaking Latin changed during the course of late antiquity and obscured quantity. This made it necessary to use accents to mark them for new learners. It seems clear that at some point there was an overlap and a mixture between the concepts of accentuation and quantity, making the accented syllable coincide with the long syllable. The juxtaposition of these two concepts may have originated in the teachings of the ancient grammarians to those who were practicing Latin scansion. They instructed the student to physically strike the ictus of each rhythmic foot (the long element) while reciting the text, which helped the speaker to internalize the scansion. They further instructed to audibly and purposefully recite the verse emphasizing the ictus in order to facilitate feeling the meter, thus creating false word accents. The idea was, however, that the recitation of the poem would ultimately be performed with the proper word accents and not the "practice" false accents. One additional thing complicates this equation: that the number of syllables in the words does not always coincide with the number of elements in the foot. This means that the oration of classical Latin verse (and potentially of its musical imitation in the Renaissance) would include a highly complex interplay between word length (number of syllables), foot length, word accent, and ictus.[36]

The theoreticians of *musique mesurée* had to face "the discrepancy between the accentual languages of the seventeenth century and the quantitative language of the ancients [which] lent a quality of artificiality to all subsequent attempts to create a union of poetry and music through

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[35] Dane, *The Long and the Short,* 24.

[36] For a deeper explanation of the relation between accent and ictus in Latin verse, see Andrew Becker, "Listening To Lyric: Accent and Ictus in the Latin Sapphic Stanza," *The Classical World* 103, no. 2 (2010): 159–82, accessed March 29, 2019, http://www.jstor.org.proxyiub.uits.iu.edu/stable/40599926. Also see Andrew S. Becker, "Non Oculis Sed Auribus: The Ancient Schoolroom and Learning to Hear the Latin Hexameter," *The Classical Journal* 99, no. 3 (2004): 313–22, accessed March 29, 2019, http://www.jstor.org.proxyiub.uits.iu.edu/stable/3298342.

rhythmopoeia."[37] As Walker explains, they came "near to achieving an accentual version of the

metrical patterns of Greek and Latin verse."[38] In several examples found in Mersenne's *Harmonie*

Universelle, his proposed *rhythmopoeia* reinforced the alignment of word stress with the long

element of the rhythmic foot. Sometimes he proposes an alternative arrangement of rhythmic feet,

but in either case, the boundaries of words and feet remain independent from each other, as we

saw above in the examples of Horatian and Virgilian verse:

Figure 2.7. Three different examples of *rhythmopoeia* when measuring French verse, Mersenne,
Harmonie Universelle.[39]

[37] Houle, *Meter In Music*, 64–65.

[38] D. P. Walker, "The Aims of Baïf's "Académie De Poésie Et De Musique"," *Journal of Renaissance and Baroque Music* 1, no. 2 (1946): 91, accessed August 7, 2019, http://www.jstor.org.proxyiub.uits.iu.edu/stable/20528720, quoted in Houle, *Meter In Music*, 64.

[39] Mersenne, *Harmonie Vniverselle*, Livre sixiesme, Quatrième Partie, Proposition XX, 385.

Quant aux mouuemens des vers rimez, dont on vfe feulement en Fran-
ce, entre plufieurs vers qui peuuent feruir d'exemples, ie prends ceux de
la premiere Prop. du 5. liure de la Compof. afin que le lecteur ne depende
point d'ailleurs que de nos liures. Or le premier couplet qui fuit,

Puifque le Monarque des Anges	– υ υ , υ – υ , – – υ	– υ , υ υ – , υ – , – υ.
Ne dedaigne point nos loüanges,	υ υ – , υ – , – υ – υ	
Chantez l'excez de fa bonté,	– υ – – , υ υ – –	
Et viuant dedans l'innocence	υ υ – , υ – , – υ – υ	
Faites connoiftre la puiffance	– υ – – , υ – υ – , υ	
De fa diuine Maiefté.	υ – υ υ υ υ – –	υ – , υ υ υ , – –

a les mouuemens que i'explique icy de la mefme forte que Demetrius & les
autres Scholiaftes Grecs ou Latins expliquent les pieds des vers dont vfent les
Poëtes anciens, auec cette feule difference que le fujet de nos vers eft plus ex-

Figure 2.8. French verse with alternative options of *rhythmopoeia*, Mersenne, *Harmonie Universelle*.[40]

At the same time that this happened, the emergence during the seventeenth century of the bar-line defined yet another level of metrical organization of the musical material. In many ways the bar itself represents a particular type of *rhythmopoeia* in which a foot-like scheme is repeated constantly. This arrangement is great for dance music (see Figure 3.4 in chapter three), but doesn't reflect the rhetorical potential of a *recitativo,* for example. In reality much of the music of the Baroque period—not only of the seventeenth century, but in general—lives in a world in which the regular organization of the beats through the bar artfully coexists with the freedom of a mixed arrangement of rhythmic feet.[41] This two organizing principles provide a level of complexity to the musical discourse in the Baroque that eluded many theorists. Indeed, *rhythmopoeia* is not a very commonly discussed concept, probably because of its impractical nature. Houle considered that,

> The chief problem in theories of *rhythmopoeia* was the relationship of measures, with their time signatures and regular bar lines, to the various and changing phrases made up of "musical feet." In Mattheson's theory, the measure and time signature were secondary to and supplementary to *rhytmopoeia*. Bar lines were ignored when they conflicted with "musical feet." Printz's theories of *rhythmopoeia* and the measure attempted to reconcile

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[40] Ibid., Proposition XXVII, 406.
[41] Interestingly this artistic coexistence is comparable to the accentual-quantitative double-layer of Latin verse. In both cases, creative choices are made using the interplay of those two organizing principles.

the two ideas by restricting the former. The inconsistencies in his explanation and his examples show, perhaps, that the two concepts cannot be reconciled, in relation either to accentual language or to musical practice.[42]

Quantitas intrinseca, as described by Printz, emerges as an attempt to solve the problem of accenting the words correctly and maintaining the quantity of the syllables within the newly defined hierarchical scheme of the bar. In other words, Printz attempts to correlate them all. This goes beyond vocal music, since instrumental music in the Baroque times was also to be modeled after the rhetorical discourse of an orator. When understood correctly in the context of compositional practices that were inherited from the musical humanists and the later emergence of the accentual musical bar, *Quantitas intrinseca* offers a door to creativity and variety in the delivery of the musical discourse. The expectations set by these organizing principles allow composers to meet them or avoid them in subtle artistic ways, creating interwoven layers of musical organization beyond the mechanical boundaries of individual metrical feet, words, or bars.

In Tritonius' or Mersenne's settings, the quantities are directly reflected in the duration of the notes. But what is unique about Printz' theory is that for him, *Quantitas intrinseca* manifests even in a series of notes of equal written length, by virtue of their position in the bar. This originated phenomena such as *notes inégales* in France, but it also occurred in more subtle ways in other countries, like in Germany.

As Edith Weber explains, the influence of the musical humanists in Germany helped shape the tradition of protestant hymnody. Many of the hymn texts were *mesurés à l'antique*, or metrical. But the rhythms of their musical setting were sometimes modified in order to better fit the emerging boundaries of the bar.[43] Weber gives the example of the German chorale

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[42] Houle, *Meter In Music*, 77.
[43] See Weber, "La musique "mesurée"," 492–495.

Herzliebster Jesu, was hast du verbrochen? to show this rhythmic adaptation from the Horatian

model, in an irregular meter called *Sapphic,* to a regularly binary meter:

Vers 1–3 : modèle : vers sapphique de onze syllabes

— ∪ — — — // ∪ ∪ — ∪ — —
Iam   sa-   tis   ter-   ris   ni-   uis   at-   que   di-   rae

Choral (après égalisation) :

— ∪ ∪ — — // ∪ ∪ ∪ ∪ — —
Herz- lieb- ster Je- su,   was hast du ver- bro- chen ?
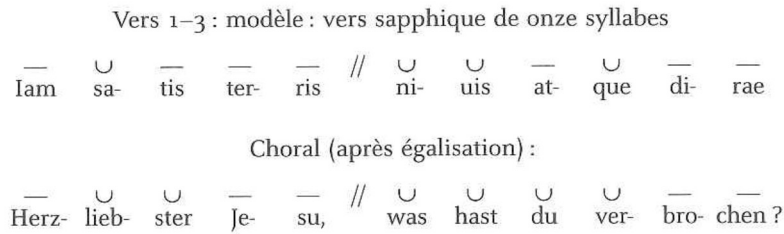
Figure 2.9. Horatian Ode *Iam satis* as a model for Johann Crüger's setting of the chorale *Herzliebster Jesu.*[44]

Cantus

HErtz - lieb - ster Je - su   was hast du ver - bro - chen/

Example 2.2. Fragment of John Crüger's melody for the chorale *Herzliebster Jesu.*[45] © 2014 Burkard Rosenberger.

Many other protestant hymns were set to music with notes of equal value, yet the

quantities of the syllables were not disregarded in this process. They were acknowledged

precisely by the position of the syllables within the emerging bar. The awareness of the principles

of syllabic quantity and its relation to emphasis is precisely the precedent for Printz's enunciation

of his concept of *Quantitas temporalis intrinseca.* More than putting forward a new concept, it is

a statement that acknowledges the tradition of properly setting a text. At that time, though, new

ideas on accentuation, emphasis, and articulation were starting to develop alongside theories on

meter, possibly leaving behind *Quantitas* as a rather old concept that was no longer discussed.

Another chorale that has been widely used and can further illuminate our study of

Quantitas is *O Haupt voll Blut und Wunden.* The melody originally appeared in the love song

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[44] Ibid., 495.

[45] Johann Crüger and Burkard Rosenberger, *Johann Crügers "Geistliche Kirchen-Melodien" (1649): Textkritische Edition* (Münster: MV Wissenschaft, 2014), 124.

Mein G'müt ist mir verwirret in Hans Leo Hassler's collection *Lustgarten Neuer Teutscher Gesäng, Galliarden und Intraden* published in 1601. It was later used by Johan Crüger in his setting of the hymn. Hassler's song has an alternation of long and short note-values that match the quantities of the text for the most part.

Figure 2.10. Weimar, Herzogin Anna Amalia Bibliothek, D-WRz Scha BS Mus 02032, Hans Leo Hassler, Cantus from "Mein g'mut ist mir verwirret," *Lustgarten Neuer Teutscher Gesäng, Balletti, Galliarden vnd Intraden: mit 4, 5, 6 vnd 8 Stimmen.*[46]

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[46] Hassler's original melody was published in Hans Leo Hassler, *Lustgarten Neuer Teutscher Gesäng, Balletti, Galliarden vnd Intraden: mit 4, 5, 6 vnd 8 Stimmen* (Nürnberg: Kauffmann, 1601), [39], accessed August 7, 2019, https://haab-digital.klassik-stiftung.de/viewer/resolver?urn=urn:nbn:de:gbv:32-1-10001459241, with the title "Mein G'müt ist mir verwirret von einer Jungfrau zart" ("A young virgin has tangled up all my thoughts and feelings"). See the Bach Cantatas Website, http://www.bach-

Example 2.3. John Crüger's setting of *Herzlich tut mir verlangen* with Hassler's melody, as it appeared in *Geistliche Kirchen-Melodien* (1649).[47] © 2014 Burkard Rosenberger.

The protestant hymnals successfully disseminated collections of older and new melodies, which were sometimes used as models for new hymns or motets. Hassler's tune was used with various other texts, among which *Herzlich tut mich verlangen,* and *Befiehl du deine Wege,* before it was used in the setting of *O Haupt voll Blut und Wunden.* Would the different text settings influence the delivery of the musical line? It is worth asking this question if we consider the potential interaction of the same melody with the different syntax of each text or with words of different length, for example. *Quantitas intrinseca,* in combination with concepts of prosody, can be an invaluable tool to give variety to the interpretation. As we saw in chapter one, Mattheson considered that in order to avoid creating "beautiful rubbish," composers should know the proper prosody of the language in which they were writing. This means that ideally a different text or a text in a different language would "produce" a different melody, or a melody with different characteristics. In the tradition of protestant hymnody, however, in order to respect the aim for

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cantatas.com/CM/Befiehl-du-deine-Wege.htm, accessed May 11, 2018. It is interesting to notice the secular origins of what later has become one of the iconic melodies associated with the Passiontide. The original *rhythmopoeia* expressed in the ternary rhythms of the melody by Hassler, certainly gives a lighter and more playful affect, in contrast with the more sober equal note rhythm of the later use. This goes perfectly in line with Mattheson's comment that—with the use of different *rhythmopoeia*—one "can make dances from church songs and to make chorales from dances." Mattheson quoted in Houle, *Meter In Music*, 67.

[47] Crüger and Rosenberger, *Geistliche Kirchen-Melodien*, 351–52.

clarity, performers should look for different inflections when singing different texts to the same melody. The guide to perform such inflections would be *Quantitas intrinseca* in combination with the different "*Commata, cola,* periods, etc.,"[48] as Mattheson says.

If we compare the English setting of this chorale, *O Sacred Head now Wounded,* with the original in German (which in itself is already a later setting for that melody) we can see that despite some proximity of English with German, and regardless of how accurate the translation may be, at the very least the length of some words does not coincide. The main noun *head* and *Haupt* occupy different positions in the bar, thus, arguably we could group the beats of the first two bars slightly differently in each language: *O Haupt – voll Blut und Wunden, O Sacred Head – now wounded.* This produces another subtle variation in the delivery, if acknowledged. And even more evidently, in the repetition of the first half in the English version, the fermata (whether or not it is intended to be held) could not be acknowledged as a point of relaxation since it is in the middle of an incomplete idea: *now scornfully surrounded__with thorns.* Something similar occurs in the second half of the German text: *o Haupt, sonst schön gezieret__mit höchster Ehr und Zier.*

Example 2.4. Johann Sebastian Bach, melody from the choral *O Haupt vol Blut und Wunden* in the St. Matthew Passion, BWV 244.[49] © by Bärenreiter-Verlag, Kassel.

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[48] See footnote 38 in chapter one.

[49] Johann Sebastian Bach, Alfred Dürr, and Max Schneider, *Matthäus-Passion: BWV 244; Markus-Passion: BWV 247* (Kassel: Bärenreiter, 1972), 224.

Example 2.5. English version of the chorale *O Haupt voll Blut und Wunden*.[50]

If we look into the Spanish version of the same chorale, we will indeed see even starker differences in the way the prosody works with the melody. First, the word *rostro* (head) is elided with the adjective *ensangrentado*. At this point we are already at the fermata, but the idea is again incomplete: *Oh rostro ensangrentado__de Cristo*. By the end of the first half, not much has been said in the Spanish version, due to the multisyllabic words. Arguably, the performance of the Spanish version would be much more connected and with longer phrasing. English and German share more characteristics, but each of the three settings should be performed differently according to Mattheson's advice regarding clarity.

Example 2.6. Spanish version of the chorale *O Haupt voll Blut und Wunden*.[51]

Acknowledging *Quantitas* in delivery is subtler and somewhat already present in the meter of a piece. However, these minute modifications of length and timing in a polyphonic setting may have an important impact in the clarity of texture of the piece. Conductors preparing a motet by Schütz or by Praetorius could benefit from making decisions regarding the lengths of certain notes that are coherent and informed by the understanding of *Quantitas intrinseca*.

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[50] This is the English text as found in *Evangelical Lutheran Worship,* Pew ed. (Minneapolis, MN: Augsburg Fortress, 2006).
    [51] This is the Spanish text as found in Secretariado Nacional de Liturgia, *Cantoral Litúrgico Nacional* (Barcelona: Coeditores Litúrgicos, 1982), 180.

It is a common practice to mark breathing spots in a longer phrase. But we shouldn't forget that by doing so, we will affect the length of some syllables and by consequence the placement of certain consonants. Experienced conductors know that those choices should not be taken lightly because it could lead to a chaotic placement of a final [s], [t] or [k] that could ruin an otherwise clean performance. Ideally, choral or vocal ensembles made up of highly trained and experienced singers will naturally tend to clean these delicate spots by "ear," paying attention to what other voices are doing. And it is true that many ensembles that have been singing together for a long time tend to develop certain conventions about these kinds of decisions (sometimes, unspoken conventions). But the modern choral conductor can go from rehearsing a college ensemble to leading a professional chamber choir, to being music director of the local church, or to recruiting and preparing the spring concert of a community choir of eighty members—all within one day. The size of the ensemble may affect choices of tempo, breath markings, and articulation commas, all of which should be closely related to *Quantitas intrinseca*.

It is becoming more common to hear performances of Baroque music with small vocal ensembles, based on available information on historical performance practices. But there should be no reason why larger ensembles or community choirs could not perform this repertoire in a satisfactory way. Actually, very often madrigals or sacred music from this era are appropriate choices of repertoire for a non-professional group, due to the simplicity of the lines, the tessitura, or other factors. Transparency of texture in performance, however, seems to be a common challenge for all kinds of vocal ensembles.

In 1830, Felix Mendelssohn wrote a Chorale Cantata based on *O Haupt voll Blut und Wunden*. The opening movement is written in imitative counterpoint consistent with the style that we may find in Schütz or Bach. We can observe how the placement of the long and short syllables in the bar is done according to Printz's recommendations based on *Quantitas intrinseca*. But beyond that, it is interesting to notice the *rhythmopoeia* that is produced by the repetition of some parts of the text and the interplay between the *rhythmopoeia* of different voices in the

imitation. In Example 2.7 below we can see for instance how the alto entrance happens over an ornamented extension of the syllable *wun* in basses in bar 15. With that extension, the basses clear the way for the alto entrance by not delivering competing substantial material at the same time. In bar 17 altos restate the same text, creating a *dactyl* in that bar as opposed to the formulaic long-short-long-short. The same thing happens in other places, like in basses in bar 19, this time creating an *anapest*. In addition to this, the entrance of the soprano line *per augmentationem* creates a different sense of flow of time in which the long and the short syllables alternate at a different speed. Example 3.9 below, in chapter three, offers a more detailed exploration of the concept of *Quantitas* at a higher rhythmic level, but here we want to simply acknowledge the counterpoint of temporal *rhythmopoeia* that this creates as well. By marking the long and short syllables, we can observe this interaction between the voices in different parts of the movement.

How can all this help a conductor make performance choices? One example can be the alto line that goes form bar 15–22. There's is no place to breathe indicated in the values of the notes, but it is certainly appropriate to breathe between beats 3 and 4 at bar 17. Otherwise, the line may be too long to be sustained in one breath. This is a good choice not only because the repetition of the text suggests a small comma (Mattheson's *comma*) that has a prosodical function, but also because the syllable *den* in beat 3 is short, therefore creating the perfect place to shorten the value of the note from a quarter-note to an eight-note. This in itself, coupled with a good sense of German pronunciation, will create a small "window" of clarity in the texture that, when added to the other "windows" happening in different places in other voices, creates relief and transparency of texture. Without these considerations, one faces the likelihood of hearing an amorphous mass of nice chords sounding one after another, or as Mattheson called it: beautiful rubbish. There are other spots in the movement in which the word *wunden* (or the word *Hohn* later on) is followed by a rest. In these cases, it would not be absolutely necessary to shorten it for breathing or prosodical purposes. But according to *Quantitas* shortening the final syllable would be arguably beneficial to the clarity of texture and consistent with the previous choice. This

happens in bars 17 and 18 for bass and tenor respectively, and in bar 24 for all the voices, among other places.

Example 2.7. Felix Mendelssohn-Bartholdy, choral parts of the 1st mov. Andante from Choral Cantata *O Haupt voll Blut und Wunden*, mm. 12–57.[52] © 1980 by Carus-Verlag, Stuttgart – CV 40.186.

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[52] Felix Mendelssohn-Bartholdy and Paul Gerhardt, *O Haupt Voll Blut Und Wunden: Choralkantate,* trans. Jean Lunn, ed. Oswald Bill (Stuttgart: Carus-Verlag, 2008).

Example 2.7, continued.

Example 2.7, continued.

Example 2.7, continued.

Of course, there are places where the conductor may decide whether or not to apply these principles based on other factors. For example, in bars 31 and 41 soprano and bass both have half notes. However, the bass has a prosodical comma in both bars, due to repetition of the text. Since the final consonants of the half notes coincide in soprano and bass (*SchmerZ-SchmerZ, HaupT-SpotT*) and they are very sonorous and hard, the conductor could consider making a compromise so that both parts place the consonant at the same time. Once again, all these choices should favor clarity and transparency of texture.

As we will see in chapter three, these concepts can be validly applied to music of different styles and epochs, but the contrapuntal vocal music of the seventeenth century would be

particularly suitable to their application. We can see how a conductor can use *Quantitas intrinseca* as a practical and stylistic tool by exploring a fragment of the sacred song *Cantate Domino canticum novum*, SWV 81 by Schütz.

First of all, if we see the part-book for the song (Figure 2.11), we will notice that there are no bar-lines. Even though some hierarchical principles of meter are already present in the composition, it relies more in the interplay of *Quantitas* to produce a particular sense of flow.

Figure 2.11. Dresden, Sächsische Landesbibliothek, D-Dl Mus.Löb.33,1, 44–45, Heinrich Schütz, cantus part of "Cantate Domino" SWV 81, from *Cantiones Sacrae* Op. 4.[53]

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[53] Heinrich Schütz, *Cantiones Sacrae* (Freiburg: Georg Hoffmann, 1625), 44–45, accessed August 7, 2019, http://digital.slub-dresden.de/id354836439.

Figure 2.11, continued.

Sometimes there are long chains of notes without clear places to breathe. Yet when we look at a score transcription, we can start to find the internal work of *Quantitas* in the architecture

of the piece. The opening statement consists of staggered entrances of the same motive with the word *Cantate*:

Example 2.8. Heinrich Schütz, opening statement of "Cantate Domino" SWV 81, m. 1.[54]

All the note values here are equal. If one were to perform it in a strict way, maximizing the length of the vowel in order to fill the entire space of time between one note and the following, it would look (and sound) somewhat like the following diagram:
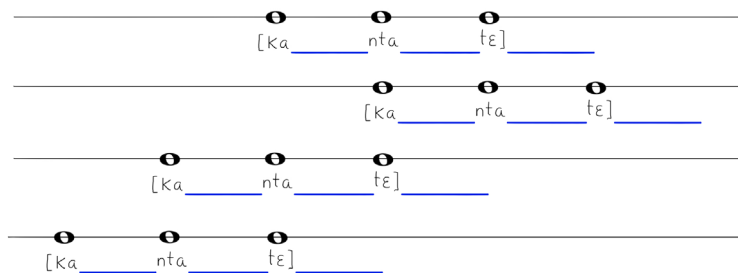
Figure 2.12. Maximized vowel length in the word *Cantate*.

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[54] Heinrich Schütz, *Sämtliche Werke,* ed. Philipp Spitta (Wiesbaden: Breitkopf & Härtel, 1970), 4:101.

56

The word *Cantate,* however, does not have syllables of equal quantity or weight. A most
natural pronunciation of the word in the piece would modify the length of the vowels in each
syllable to be coherent with the accentuation pattern.[55] In this case it would be a short-long-short
arrangement: ∪ – ∪. The *n* in the syllable *Can* helps connect and give direction to the second
syllable *ta,* and the shortening of the syllable *te* creates space for entrances of other voices. This
diagram represents the richness of texture that is achieved by this approach:
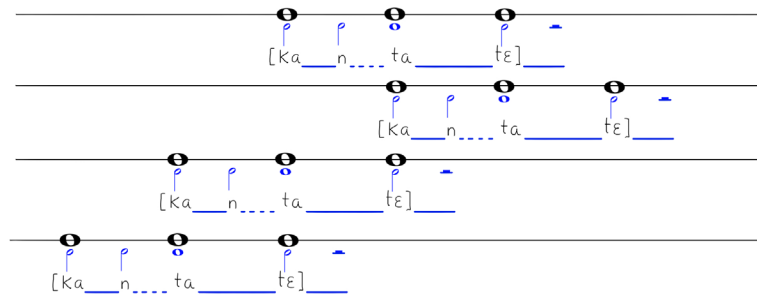
Figure 2.13. Adapted vowel length in the word *Cantate.*

The effect produced by shaping a motive according to *Quantitas* in this case is similar to
a slight crescendo and diminuendo. And some editions of music of this period indeed suggest
those crescendos and diminuendos in an attempt to shape the line. But if this is done disregarding
Quantitas, the result is often not satisfactory enough. *Quantitas* is a much more effective tool
precisely because it is embedded in the rhetorical nature of the composition itself, whereas
dynamics appeared rather as tools of contrast in different contexts.

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[55] The correspondance between syllabic quantity and accentuation made by the theorists of
musique mesurée when they adapted their accentual languages to follow quantitative principles, set the
frame for Printz to formulate his theory of *Quantitas* as applicable to accentual patterns.

Example 2.9. Heinrich Schütz, "Cantate Domino" SWV 81, m. 9–22, with adapted note lengths for clarity.[56]

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[56] Schütz, *Sämtliche Werke*, 102–103.

Example 2.9, continued.

Example 2.9, continued.

In Example 2.9, I propose a series of solutions to apply *Quantitas* and produce textural relief in addition to good places for breathing and rhetorical or prosodical *commata*. In bar 10, for example, I suggest a quarter note rest only after the word *Cantate* because in this case, the music proceeds with the rest of the text. In this case, *Cantate* is not simply the opening statement, but the full phrase that flows towards the word *novum*. Therefore a quarter note rest is a way of marking the score that would acknowledge that phrasing choice while respecting *Quantitas*. Similar markings are appropriate for the word *Domino* in the same and subsequent bars. If we look at bar 12, I did not suggest the use of the connecting *n* like in the word *Cantate* ($\cup - \cup$), since the word *canticum* has a different accentual pattern ($- \cup \cup$), and therefore it is best to maximize the vowel length of the syllable *can*, and bring the *n* as late as possible. In bars 12 and 13, tenor and alto have a special effect of a quick entrance. Therefore, I suggest that the modification of length of the syllable *te* is unnecessary in the case of the tenor, and slightly different in the case of the alto. In bars 17 the bass has a perfect representation of the text *in ecclesia* ($\cup \cup - \cup \cup$) and just needs a small modification of the word *sanctorum* ($\cup - \cup$) afterwards. However, in bar 21 I suggest a slight shortening of the last syllable of the word

ecclesia, and a connecting *n* in *sanctorum* which, in addition to better matched syllabic emphasis*,* enhances the hemiola.

Many of these choices are certainly open to discussion, but I offer them as a mere suggestion and guide to how a choral conductor striving to achieve excellence should not disregard the minute details of the duration of a vowel, a consonant, or a syllable. Many performance practice choices have come to us through tradition, but the study and application of *Quantitas temporalis intrinseca* to this and other compatible repertoires can offer a more systematic and informed approach to solve issues of texture, breathing, prosody, some level of dynamics, and as we will see in chapter three, even shape and phrasing.

Chapter 3: QUANTITAS BEYOND THE 17TH AND 18TH CENTURIES

AND BEYOND THE BAR

> *Music is a language. And linguistic rhythm is common to everyone. It varies from language to language and in different nations and continents, but language has a rhythm. And if that rhythm is totally negated, a form of automatism emerges. And automatism is repellent.* [1]

If music is a language through which the performer and the audience establish a communication, like in any other language, the communicator has endless ways to subtly manipulate or alter the delivery of the musical discourse, even in a frame full of strict rules and boundaries. We therefore expect that *Quantitas Intrinseca,* as a concept born of the nature of spoken language applied to music, should be relevant for any and all music that intends to convey a message or move the listener, including music beyond the seventeenth and eighteenth centuries during which the concept was defined and studied. We have already seen in chapter two how composers of Renaissance vocal music carefully respected the text in their musical setting, which constitutes the root of *Quantitas*. This approach, exemplified in the treatment of the text in the psalm settings of Petrus Tritonius and the protestant composers of the early sixteenth century, has a lot in common not only with the treatment of the text in a Schütz motet, but also in one by Brahms or Mendelssohn.

Among the many nineteenth-century composers who carefully studied the music of the past and applied its techniques to their compositions, Brahms and Mendelssohn are notable for their studies on Schütz and Bach respectively.

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[1] "Musik ist eine Sprache, und Sprachrhythmus ist etwas das jeden Menschen geläufig ist. Es ist sehr verschieden in den verschiedenen Sprachen, auch in den verschiedenen Nationen und Kontinenten. Aber, Sprache hat einen Rhythmus. Und wenn dieser Rhythmus total negiert wird, dann entsteht eine Automatik. Und Automatik ist etwas abstoßendes." Eric Schulz, Nikolaus Harnoncourt, Dorothea Röschmann, Michael Schade, Florian Boesch, and Joseph Haydn, *Making of "die Jahreszeiten": Nikolaus Harnoncourt In Rehearsal At the Salzburg Festival* ([n.p.]: Unitel, 2013).

Example 3.1. Heinrich Schütz, "Deus misereatur nostri" from *Cantiones Sacrae,* SWV 55, mm. 1–13.[2]

Example 3.2. Johannes Brahms, "Gestliches Lied, Op. 30," mm. 1–15.[3]

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[3] Johannes Brahms, and Paul Fleming, *Geistliches Lied: [von P. Flemming, Für Vierstimmigen Gemischten Chor Mit Begleitung Der Orgel Oder Des Pianoforte] Op. 30,* (Leipzig: Breitkopf & Härtel, [19--?]), 1.

If we look at Brahms' *Geistliches Lied* Op. 30, we can observe a number of similarities with a motet from *Cantiones Sacrae* by Schütz, in particular *Domine Misereatur Nostri*.[4] First, the *alla breve* time signature and the doubled note values in Brahms are a direct reference to the *stile antico*. Then we can notice the head-motive imitative technique, which in Brahms becomes an impressive double canon *alla settima,* which recalls the mastery of canonic writing of the Renaissance. The accompaniment of a basso continuo part in Shütz becomes a full keyboard accompaniment in Brahms, but it retains the discrete supportive role of a continuo part. Indeed, in the Romantic period composers pursued expressivity in music in different ways than in the Baroque period, but there are no critical aesthetic differences in the crafting of these two pieces. Even though one piece was written roughly two hundred years after the other one, Brahms' choices of voicing, texture and technique are enough reasons to claim that applying the principles of *Quantitas* would not be only valid, but actually helpful and arguably necessary in order to achieve an optimal performance. The text underlay follows the placement of weak or passing syllables in deemphasized beats, and we see the elongation of notes on emphasized syllables. The *crescendo-diminuendo* markings in Brahms give unity to long musical gestures and arguably are more related to phrasing and direction in the Romantic period than with actual change of volume. This doesn't mean, however, that the *Quantitas* of the notes within the long phrase should be ignored and every syllable should be sung as a gradual and constant *crescendo* towards the point of emphasis of the phrase. That would be a mistake that deprives the melody of its rhetorical qualities. Therefore, special effort should be made to emphasize the *Quantitas* of the piece even in a subtle way, and avoid focusing only in the Romantic long line. Similarly, a motet by Shütz must have a sense of direction in a musical line, and not be performed with articulation as the sole focus.

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[4] The nineteenth century edition of Schütz's *Cantiones Sacrae* by [Phillip] Spitta is used here to emphasize the similarities with Brahms' *Gestliches Lied* Op. 30.

Thinking of *Quantitas* can enhance the performance of Brahms' motet if we consider as an example bars 41–47. The text is placed in the score in a way that reflects the following accentuation pattern:

$$\smile \ - \ \smile \ - \ \smile \ - \ \smile \ \smile \ - \ \smile \ \ \smile \ - \ \smile$$
Sei nur in allem Handel ohn Wandel, steh feste.

Brahms has followed Printz' advice to place the text in specific beats of the bar to match the natural emphasis pattern of the phrase. In the soprano part, the first four syllables have half notes, but *Quantitas* can inform our treatment of the consonants as well as the need for a glottal stroke in the word *allem,* in order to bring interest to the declamation of the text. The word *Handel* has a longer first syllable, which makes the *crescendo-diminuendo* happen almost effortlessly, giving direction to the phrase. A similar effect occurs with *ohn Wandel*. In the alto and bass part, however, the word *Handel* and *Wandel* have similar durations for each syllable. According to *Quantitas,* we should shorten the second syllable. This seems to be a more musical decision that would prevent the average choir from sounding as if they were pronouncing the word *Han-DEL.* The informed conductor can take advantage of the consonant "l" to accomplish this without truncating the duration in a distasteful way.

Example 3.3. Johannes Brahms, "Geistliches Lied Op. 30," mm. 41–47.[5]

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[5] Brahms and Fleming, *Geistliches Lied,* 3.

Optimizing the use of the rests or "caesuras" in such a way thus help performers increase transparency and cleanness in the texture of a phrase. Mattheson, however, warns about abusing the use of these *caesuras* in a melody for fear of making the phrase sound chopped and disconnected. Certainly the goal is not to interrupt or break the line, but to dress it with the sonorous textural relief that is proper of spoken language. That's why he advises that:

> If its flowing quality is necessarily lost through frequent stops in a melody, it is understood that one has reason not to use such interruptions frequently. Eight rules serve for this: […] 5. In the course of melody, the little intervening resting places must have a certain connection with that which follows.[6]

Considering Mattheson's idea therefore, the half-note rest for the bass in bar 46 must not feel to the singer nor sound to the listener as a stopping of the phrase, but rather an integral part of a longer line, which includes the material that follows.

Varying qualities of consonants can often be used to the advantage of this flow and connection of musical gestures. In particular, voiced consonants like [m], [n], and [l] can offer different subtle degrees of connection between sounds when compared to unvoiced consonants like [f], [s], or stops like [k], [p], and [t], where the sound is actually interrupted. An experienced artist, however, will be able to use stops even without interrupting the sense of flow.

Rheinberger's *Abendlied* is another example of a late-Romantic piece that lends itself perfectly to the application of *Quantitas* principles, because it was written following rhetorical and textural principles similar to the previous examples of Brahms and Schütz. Most importantly, the intricacies of the six-part writing present greater performing challenges related to the placement of final consonants and the preservation of a clean and coherent texture. The consideration of *Quantitas* becomes necessary to make such decisions, and I would suggest that experienced conductors apply its principles in the rehearsal process even when they may not possess a clear awareness of the concept. Just by virtue of the fact that *Quantitas* is naturally

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[6] Harriss, "Johann Mattheson's," 492.

related to prosody and is part of all languages, *Quantitas* will automatically influence the process of music-making if the conductor pays enough attention to the text. The importance of the familiarity with the prosody of a language cannot be stressed enough. This is of course an argument for the advanced study of languages by choral conductors. The more advanced the language skills, the higher the degree of subtlety and artistry as it relates to the application of *Quantitas Intrinseca.* Mattheson, in *Der Vollkomene Capellmeister,* pointed out the necessity of mastering the language when setting a text to music with the example of an aspiring Kapellmeister, warning that:

> If he adequately understood the languages to a certain measure, yet not to the prosody, much less their way of writing, speaking, and reasoning, then he would make long syllables short and short ones long, the caesuras would impinge upon the meaning and the purpose of the narrative, and consequently he would produce beautiful rubbish.[7]

Example 3.4. Josef Rheinberger, "Abendlied Op. 69 No. 3," mm. 31–49.[8] © 2001 by Carus-Verlag, Stuttgart – CV 50.265.

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[7] Ibid., 381.

[8] Josef Rheinberger, *Geistliche Chormusik Für Gemischten Chor = Sacred Music for Mixed Choir,* ed. Wolfgang Bretschneider (Stuttgart: Carus-Verlag, 2001), 49.

Example 3.4, continued.

In this final section of Rheinberger's *Abendlied,* bass and tenor 1 have no rests from their

entrance at bar 34 until the end of the piece. With a large choir it would be perfectly possible to

use the technique of "choral breathing" to avoid any breaks in the line. But would this be

desirable? Not really. As we have seen in chapter two, the consequences of singing a long line

continuously because the writing has no rests, not only is counterintuitive to the declamation of

the text, but it actually blurs the beauty of the contrapuntal texture and diminishes the piece to a

series of changing chords and syllables. An extreme case of this is the motet *Spem in Alium* by

Thomas Tallis. The 40-part texture of this piece gives no room to hear the counterpoint in some

sections, and only the massive chords are heard with a hint of textural chaos underneath. But in

Rheinberger it is important and possible to find windows of transparency for the counterpoint to

come through, and it can be accomplished by looking at the characteristics of the text, and

therefore its *Quantitas*. Rheinberger has brilliantly laid out the following phrase according to

Quantitas:

<div align="center">

– ∪ – ∪ – ∪ – ∪
Und der Tag hat sich geneiget

</div>

If we follow the bass part, we can observe that it starts the phrase with a syncopation that

avoids the downbeat. This gives an important sense of *anacrusis* to the words *und der*. The

following words *Tag hat sich* follow in the intrinsic long and short beats of the bar. At the end of

the phrase, he elongates the value of the stressed syllable in *geneiget*. The combination of these

three things, all in accordance with the stipulations of *Quantitas Intrinseca,* produce a line that

has direction from beginning to end and that has a natural declamatory flow. The other voices

follow a similar plan with slight variations. Punctuation (often produced by repetition of the text,

like the commas in this example) is always a good guide to create those windows of transparency

in the texture. Here, the syllable that precedes the comma or the period is an unstressed syllable,

which allows for a shortening. In bar 39, all the voices except soprano 2 have a resolution on the

downbeat. They are singing the unstressed syllable of the word, and it is followed by an elongated

stressed syllable. Therefore it too should be unstressed and possibly shortened. Soprano 2 has a

delayed resolution, which has appropriately been marked with a *crescendo-diminuendo*. This

marking corresponds to the *Quantitas* (aka phrasing, as we will see below) of the word, in spite of

the fact that the position of the notes does not correspond to the expected *Quantitas* based on the

bar-line. Deciding how exactly to shorten the downbeat presents a number of challenges, though.

First of all, the final consonant is a [t], which is a very audible stop and cannot be hidden. Tenor 1

and bass continue singing right away on half notes, soprano 1 continues in quarter notes, and alto and tenor 2 have rests. Tenor 1 and bass should take an eight-note rest to place the [t] before continuing, and in order to match them, alto and tenor 2 should do the same, otherwise we would have an unnecessary (and noisy) cascade of [t]'s. Soprano 1, however, will have to place the [t] sooner, also on an eight note rest, to allow proper separation of the phrase and to allow the piano dynamic to come through. It must be a discrete [t] in order to not be in conflict with the one in the lower voices. Soprano 2 will be left to place their [t] at the end of the bar or very beginning of the next one.

These types of decisions are very important to reinforce voice groupings and clean the performance from unnecessary and distracting noises. And when well done, they are very effective in conveying coherence and expressivity based on the contrapuntal craft of the piece. Certainly, many of these choices would or could be directly done by experienced singers, but since there are many different ways to successfully integrate these *caesuras,* it is important for the conductor to mark them ahead of time in order to save time and help everybody do it in the same way. That is precisely what we have learned from conductors like Thomas Dunn, who was an avid score marker and constantly reminded his students of the importance of this practice.

In the twentieth century, the most relevant areas where *Quantitas* offers an insightful perspective are in music with a renewed interest in chant, and also in some neoclassical and minimalistic contexts.

In the late nineteenth century, one of the most notable figures in the study, classification, and re-edition of the corpus of Gregorian chant was Dom Joseph Pothier (1835–1923), a French priest and Benedictine monk appointed by pope Pius X to head the editorial commission for a

new official Vatican edition of liturgical chant books.[9] Shortly after becoming Pope, Pius X

issued a *motu proprio* where he stated that:

> Gregorian Chant has always been regarded as the supreme model for sacred music, so
> that it is fully legitimate to lay down the following rule: the more closely a composition
> for church approaches in its movement, inspiration and savor the Gregorian form, the
> more sacred and liturgical it becomes; and the more out of harmony it is with that
> supreme model, the less worthy it is of the temple.[10]

This *motu proprio* promoted[11] a renewed interest in Gregorian chant in the world of

sacred music, and the Solesmes school became the flag bearer of the newly unified and reformed

style of singing Gregorian chant. Pothier promoted the idea that Gregorian chant should be

performed with equal duration of notes. His successor André Mocquereau (1849–1930)

conceived a system of "free musical rhythm" for chant,[12] even though—as David Hiley has

pointed out— "some writers have argued that the shorter and longer notes stand in strict mensural

relationship to one another."[13] For Hiley "there can be no doubt that rhythmic differentiation was

an essential element"[14] in some historical practices of chant. This free rhythm approach to chant

by Mocquereau, in which notes were grouped into units of two or three notes, created the need for

the accented syllables to be acknowledged with some sort of emphasis that was not based

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[9] See Eugène Cardine and David Hiley, "Pothier, Joseph," *Grove Music Online,* ed. Deane Root, accessed July 6, 2018, https://www-oxfordmusiconline-com.proxyiub.uits.iu.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000022185.

[10] "Cantus gregorianus ut exemplar optimum sacrorum musicorum semper est habitus, cum vera sit haec lex: musica compositio eo magis est sacra et liturgica, quo in modis cantum gregorianum sequitur, et eo minus templi digna est, quo magis illo optimo exemplo peccat." Pius PP. X, "Tra le Sollecitudini," *Motu Proprio SS.MI D. N. Pii PP. X De Musica Sacra* (November 22, 1903), §3, the website of The Holy See, accessed July 31, 2019, http://w2.vatican.va/content/pius-x/la/motu_proprio/documents/hf_p-x_motu-proprio_19031122_sollecitudini.html. Translation from https://adoremus.org/1903/11/22/tra-le-sollecitudini/ accessed July 31, 2019. See also Anthony Ruff, *Sacred Music and Liturgical Reform: Treasures and Transformations* (Chicago: Hillenbrand Books, 2007), 272–292.

[11] A growing interest in Gregorian chant developed during the nineteenth century, and had already set in progress a rigorous classification and study of the sources, led prominently by Dom Joseph Pothier. See Cardine and Hiley, "Pothier, Joseph."

[12] See Bob Richard Antley and Johannes de Garlandia, "The Rhythm of Medieval Music: A Study In the Relationship of Stress and Quantity and a Theory of Reconstruction: with a Translation of John of Garland's De Mensurabili Musica*"* (PhD diss., The Florida State University, 1977), 34–40.

[13] David Hiley, *Western Plainchant: A Handbook* (Oxford: Clarendon Press, 1993), 379.

[14] Ibid.

primarily on length (even though in practice it was arguably impossible to eliminate note

lengthening of some sort in stressed syllables).

Mocquereau's system was the ideal practice at the time when composers of sacred choral

music were writing for the church in accordance with Pope Pius' *motu propio*. We therefore can

see threads of his "free musical rhythm" in musical works of the time. Thus, *Quantitas* continues

to quietly operate, on its many levels, as an integral part of the compositional style of the sacred

music of this era that was based on Gregorian chant.

One elegant and clear example of this operation of *Quantitas* can be found in Frank

Martin's *Mass for Double Chorus*, composed between 1922–1926. In the Agnus Dei, choir 2

establishes a background texture, almost as an *ostinato*, singing the text in steady quarter-note

chords, while choir 1 sings a unison melody in chant style with rhythmic alternation of shorter

and longer values that freely acknowledge the word stress of the line. The constant change of

time signature (which follows the pattern 5-5-4-4 beats per measure in the first part of the

movement) allows for the movement to be perceived without a regular metric accent, and

therefore the syllabic quantities of the text in choir 1 are what give flow to the melody.

Registration, dynamic markings, and the addition of melismas only help reinforce the *Quantitas*

in the chant-like melody in a way that nevertheless is still coherent with the recently introduced

concept of "free musical rhythm" in chant. This movement embraces and reconciles the

traditional presence of *Quantitas* in the text with the "static" flow of music with little or no

rhythmic metric emphasis.

Example 3.5. Frank Martin, "Agnus Dei" from *Mass for Double Chorus a Cappella*, mm. 1–4.[15]
© 1972 by Bärenreiter-Verlag, Kassel.

The French composer and organist Maurice Duruflé (1902–1986) used actual chant

melodies in his *Quatre Motets sur des Thèmes Grégoriens* (1960)*,* but he has a similar approach

in the pursuit of little metric emphasis while preserving a sense of flow of the words. We can

perceive this particularly in the *Tantum Ergo*, where the pseudo imitation between tenor and

soprano, and the staggered entrances strongly resemble the architecture of the imitative motets of

the Renaissance. The texture here has few obvious rests, and there is a need to create spaces by

getting some voices "out of the way" in order for the counterpoint to be heard. It is precisely in

this kind of texture where applying *Quantitas* principles may prove helpful in making those

decisions, as we have seen in chapter two.

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[15] Frank Martin, *Mass for Double Chorus a Cappella* (Kassel: Bärenreiter, 1972), 50.

Example 3.6. Maurice Duruflé, "Tantum Ergo" from *Quatre Motets*, mm. 1–5.[16] © 1960 Éditions Durand.

A common characteristic of the previous two examples is the constant change of time signature. Time signature has been part of traditional music writing since the seventeenth century. In these particular examples, however, the role of the time signature is not primarily to organize the metric emphasis, but rather to aid in avoiding it. Indeed, these examples could have been written without a bar-line without losing a crucial part of their aesthetic when interpreted.

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[16] Maurice Duruflé, *Quatre Motets Sur Des Thèmes Grégoriens: Pour Chœur a Cappella* (Paris: Éditions Durand, 1960), 11.

Nevertheless, other musical examples in the twentieth century make use of changes in time signature to produce irregular accentuation patterns closely following the text, much like in the manner in which Petrus Tritonius wrote his Horatian odes almost five centuries prior. That is the case of Arvo Pärt's *Bogoroditse Djevo,* where he reinforces the metric accents of the bar with written accents in the music. In Pärt's *Magnificat* we see a slight different approach. There are no clear accents marked, but there are no defined bars either. Instead, dotted bar-lines divide each word, and syllabic quantity is acknowledged both with length of note and use of dissonance. The result is a balanced choice of meditative, almost mechanic, mantra-like declamation of the text while at the same time retaining the rhetorical fluidity of the line. This type of approach, very much in line with both the post-modern and the neoclassical aesthetic, contributed to the naming of this style "sacred minimalism."[17]

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[17] See Paul Hillier, *Arvo Pärt* (Oxford: Oxford University Press, 1997), viii, 1–23.

Example 3.7. Arvo Pärt, "Bogoroditse Djevo," mm. 1–15.[18] © 1990 by Universal Edition A.G., Wien.

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[18] Arvo Pärt, *Bogoróditse Djévo = Mother of God and Virgin: Für Gemischten Chor (SATB) a Capella (1990)* (Wien: Universal Edition, 1996), 1.

Example 3.8. Arvo Pärt, "Magnificat," mm. 1–4.[19] © 1989 by Universal Edition A.G., Wien.

Because of its close relation to text and rhetoric, the study of *Quantitas* can also help us to understand phrasing. According to its definition in the early eighteenth century, *Quantitas* refers strictly to the hierarchy of the music material within the bar-line. The musical "shape" generated by such hierarchy represents only one level of organization of the musical phrase, and one with which theorists in the eighteenth century were very concerned: the bar. It is rare, however, to find musical material that comes to repose after only one bar. Similarly, in speech, a phrase is rarely completed after just a couple of words. Entire phrases, both musical and spoken, are larger structures with their own higher level of organization. By contrast, we can also find micro-levels of organization at the level smaller than the bar, or even the beat. We can apply the hierarchical principles of *Quantitas* to such larger and smaller musical structures to help define their shapes as well in fine detail. *Quantitas* thus becomes a useful tool for a musician when making decisions about how to execute a given musical phrase, especially one with text. We can understand how to use this tool by exploring two contrasting concepts: hypermeter and diminutions.

The term hypermeter was "first used by [Edward T.] Cone (1968) to refer to levels of metrical structure above the notated measure."[20] It is the idea that a group of musical bars has its own metrical organization that repeats, like a magnified version of a bar. The idea, however, is

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[19] Arvo Pärt and Paul Hillier, *Collected Choral Works,* ed. Mike Breneis and J. S. Durek (Vienna: Universal Edition, 2008), 35.

[20] Justin London, *Hearing In Time: Psychological Aspects of Musical Meter* (New York: Oxford University Press, 2004), 19.

not that recent, and suggestions of it can be traced back to Kirnberger's discussions on compound

measures in his *Die Kunst Des Reinen Satzes In Der Musik.* His were some of many repeated

discussions by music theorists during the eighteenth century on the topic of meter and the

properties of the bar. They discussed accentuation patterns, rhythms, groupings of notes, and the

relationships of all of these phenomena to *affect,* character, and expressivity in performance.[21]

Their assertions were sometimes confusing and difficult to reconcile, as they were trying to

represent a great variety of musical characteristics through meter, resulting in the appearance of

long lists of different meters. As Roger Matthew Grant states, their struggle "led to a multiplicity

of measures, a proliferation of 'times.'"[22] Very frequently in their discussions, theorists addressed

the concept of organizing a series of beats into groups of two, three, or four. The way they

discussed it revealed their insights on phrase structure and emphasis, as we will see below.

Many theorists, like Michel Pignolet de Montéclair (1667–1737), Joseph Lacassagne

(c1720–c1780), and Jean-Jacques Rousseau (1712–1778), considered that the variety of time

signatures could be reduced to categories that included only duple and triple meters.[23] Kirnberger,

like Rameau, included an additional division of the measure in 4 beats, or quadruple meter.

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[21] The complexity and extensiveness of the topic possibly led to the abandonment of such reconciling efforts. Instead theorists attempted new simplified approaches to meter and time which offered advantages for the new music styles centered in form and proportion during the classical era, but were forced to leave behind some of the subtleties of a musical discourse that was more based on rhetorical principles during the Baroque times. Often regarded as *good taste* in the late Baroque—see Francesco Geminiani and Robert Donington, *A Treatise of Good Taste In the Art of Musick* (New York: Da Capo Press, 1969)—these performance subtleties didn't disappear, however, and possibly re-emerged in the Romantic period as part of the individual performance styles of the *virtuoso soloist* figures, which contrasted with the more balanced frame of the accompanying ensemble.

[22] Roger Mathew Grant, *Beating Time & Measuring Music In the Early Modern Era* (New York, NY: Oxford University Press, 2014), 106.

[23] Ibid., 116. Probably still influenced by Zarlino's catalogue of poetic feet according to those adequate for duple and triple meters. See also Grant, *Beating Time*, 111.

Figure 3.1. Kirnberger, succession of pulses of equal length that the mind organizes metrically, *The Art of Strict Musical Composition.*[24]
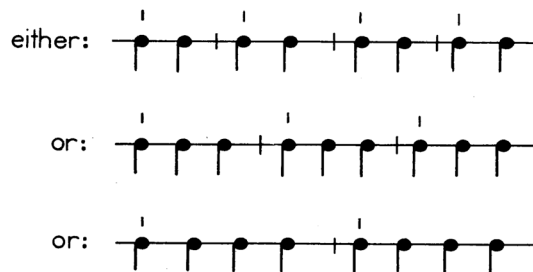
Figure 3.2. Kirnberger, organization of pulses in groups of 2, 3, and 4, *The Art of Strict Musical Composition.*[25]

While Montéclair believed that "the measure of four beats is nothing other than the measure of two beats doubled,"[26] Kirnberger made a significant distinction by which beats three and four behave as an unstressed pair, compared to the stressed pair of beats one and two. Said otherwise, for Kirnberger the 4/4 bar is not the simple addition of two 2/4 bars because this would produce a wrong pattern of stress. For him, the first half of the 4/4 bar is more stressed than the second, which renders it unique and distinct from the mere addition of two 2/4 bars:

> In quadruple meter, the first and third beats are accented, but the second and fourth unaccented. The former are also called strong and the latter weak beats. Of the accented beats, the first is in turn stressed more than the third, as can be seen from [see Ex. 3.11 below], where – means accented, and *v* unaccented.[27]

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[24] Johann Philipp Kirnberger, *The Art of Strict Musical Composition* (New Haven: Yale University Press, 1982), 383.

[25] Ibid.

[26] Michel Pignolet de Montéclair, *Principes de musique* (Paris: 1736), quoted in Grant, *Beating Time*, 116.

[27] Kirnberger, *The Art of Strict,* 392.
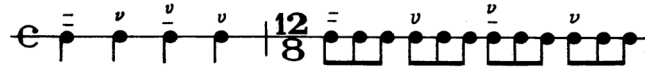
Figure 3.3. Kirnberger, different levels of stress in a bar of four beats, *The Art of Strict Musical Composition.*[28]

When later on Kirnberger discusses what he calls "compound"[29] meters, he makes a connection between this set of sub-structures at the interior of the bar and a musical phenomenon that occurs in a group of bars:

> In duple as well as in triple meter, there are melodies in which it is obvious that the whole measures are alternately strong and weak, so that a whole measure is heard as only one beat. If the melody is of such a nature that *the entire measure is felt as only one beat, two measures must be grouped together to form just one, whose first part is accented and the other unaccented.* If this contraction were not to occur, the result would be a melody consisting only of accented beats, because of the necessary weight of the downbeat. This would be as unpleasant as a sentence in speech consisting entirely of one-syllable words, each of which had an accent. [132] This resulted in compound meters, namely, compound 4/4 from two combined measures of 2/4, compound 6/8 from two combined measures of 3/8, etc.[30]

The last sentence here quoted may seem to validate Montéclair's previous simplification. However, Kirnberger proceeds to clarify:

> This combining [of measures] actually occurs only so that the player can arrive at the *proper performance* and play the second half of such a measure more lightly than the first.[31]

This statement has very important implications for the concepts of phrase and musical shape, since the need to group several bars into one that he calls "compound" arises from the fact

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[28] Ibid.

[29] Grant chooses to use the word "compounded" instead of "compound" for Kirnberger's term *zusammengesetzten* to avoid confusion due to the fact that: "in the twenty-first century American pedagogical tradition, we call meters with a triple subdivision "compound." […] Eighteent-century German theorists described yet another type of measure: one in which two smaller measures were written together in the space of one." Grant, *Beating Time*, 113.

[30] Kirnberger, *The Art of Strict,* 398 (my italics).

[31] Ibid., (my italics).

that a tasteful performance of those bars would require a variation of stress from bar to bar in

order to create direction or musical flow and unity.

All these confusing series of groupings of beats and bars in these discussions ultimately

acknowledge that the theorists of the time perceived the presence of smaller hierarchical

structures nested within larger ones. Kirnberger understood that recognizing those structures at

their different levels has a direct effect on the way the musical gestures or shapes are performed.

He thus combines phrase analysis with the theories of *Quantitas* in a manner that points very

closely to what eventually became hypermeter.

William E. Caplin, however, says that,

> Unlike individual beats, whose grouping into measures arises by means of accent, the
> grouping of measures into phrases occurs when the flow of the melody is demarcated by
> *resting points* of various degrees […] Thus Kirnberger's *rhythm*[32] should not be
> understood as *hypermeter*, since the measures themselves are not construed as accented
> or unaccented.[33]

Even though the concept of hypermeter is certainly not fully formed at this point, we

should not discard the possibility that the idea is already present in an early form in Kirnberger's

discussions. It is true that at this time the emphasis scheme of a series of measures may not

always be as regular as to clearly talk of *hypermeter*, but at least of higher-level rhythms.[34] Caplin

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[32] Caplin refers to Kirnberger's comments on "rhythmic units", the name he gives to musical
phrases: "The musical statement that is complete and ends with a formal cadence we will call a *section* or
period; but the incomplete one that ends only with a melodic break or a satisfying harmony we will call a
phrase or a *rhythmic unit*." See Kirnberger, *The Art of Strict*, 405.

[33] William Caplin, "Theories of Musical Rhythm in the Eighteenth and Nineteenth Centuries," in
The Cambridge History of Western Music Theory, ed. Thomas Christensen, The Cambridge History of
Music (Cambridge: Cambridge University Press, 2002), 670, accessed January 26, 2018,
doi:10.1017/CHOL9780521623711.023.

[34] See Justin London, "Rhythm," *Grove Music Online,* ed. Deane Root, §I, 4, accessed April 17,
2018, https://www-oxfordmusiconline-
com.proxyiub.uits.iu.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-
e-0000045963, for G. Weber's comments on higher rhythms. If we go all the way back to Petrus Tritoinus'
settings of Horatian verse—when *rhythmopoeia* was not yet primarily associated with the regular patterns
of dance music—we can see that some verses follow irregular combinations of rhythmic feet. With this in
mind, the concept of *hyper-rhythmopoeia* could in turn be useful for the analysis of irregular higher-level
rhythms in phrases that don't offer metrical regularity. As we saw above, a recent manifestation of this can
be seen in the phrases with changing meter in certain modern compositions of Arvo Pärt or Stravinsky.

comments that, "as theorists came to consider higher-level rhythms to be essentially symmetrical, they increasingly characterized them as decidedly *metrical* in quality."[35] Kirnberger certainly sees an alternation of "strong and weak" measures in some melodies as we have seen above (even though Caplin seems to disregard that assertion) and he is able to recognize those higher rhythmical structures.

Accent, emphasis, character, musical flow, and structure seem to be very closely related for the theorists of the early eighteenth century. The old terms *Quantitas Intrinseca & Extrinseca* were eventually abandoned. But their meaning remained at the center of the discussions on accentuation, because the origins of the bar (measure) itself and the scheme of stress within it is directly derived from—and explained by—the effects of *Quantitas*. *Quantitas* is therefore an important link between rhetoric and musical phrasing theory.[36] It is a concept that sits at a cross point in the shift from the old rhetoric-based models of musical discourse and the emerging models based on a new understanding of time,[37] and that has been overseen and masked by the quick aesthetic changes and musical developments of the mid-eighteenth century.

The multi-level hierarchical structures that we have been discussing so far arise from the grouping of a small number of beats or a small number of bars. But often we encounter chains of faster notes known as *diminutions* that "belong" or that could be grouped underneath notes of longer value from which they derive. The hierarchical principles of *Quantitas* apply also at this smaller level.

The art of diminutions flourished particularly during the sixteenth and seventeenth centuries as an embellishment practice by which a note of a certain length was divided into

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[35] Caplin, "Theories of Musical Rhythm," 683.

[36] See Geoffrey Chew, "Articulation and phrasing," *Grove Music Online,* ed. Deane Root, accessed January 16, 2019, http://www.oxfordmusiconline.com.proxyiub.uits.iu.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000040952.

[37] See Roger Mathew Grant, "Epistemologies of Time and Metre in the Long Eighteenth Century," *Eighteenth Century Music* 6, no. 1 (2009): 59–75, accessed September 15, 2017, doi:10.1017/S1478570609001730.

several notes of a smaller value as it moved to the next note. This was an improvisatory practice, but over time composers started writing down the diminutions that they wanted to hear in their compositions. The distinction between the structural melodic material and the embellishments in the line could sometimes be difficult to make, unless the tune was very well known. There are countless examples in the literature of the Renaissance and Baroque music in which a string of small values is actually derived from an underlying "skeleton" or "architectonic" frame of notes ornamented with divisions. Performers have to develop the capacity to recognize that skeleton because it shows more clearly the musical shape that the musician ought to be executing. And just like in rhetoric, a change of shape or gesture could change the meaning or intention. The practice of *rhythmopoeia*, which is precisely an exercise in recognizing underlying rhythmical feet in a musical passage, can be extremely helpful in identifying that musical skeleton. Marin Mersenne (1588–1648) in his *Harmonie Universelle* (1636–37) provides an example in which he shows the rhythm of the "ionic minor" foot giving structure to the following melodic line of a *bransle gay*:

Figure 3.4. Marin Mersenne, "Ionic minor" foot in a *bransle gay*, *Harmonie Universelle*.[38]

Inexperienced musicians could fall into the mistake of playing each note with a similar emphasis, or playing the musical phrase applying one long arching crescendo and diminuendo from beginning to end. Both of these approaches blur the rhetorical richness and flow of the line.

The benefits of studying both *Quantitas* and *rhythmopoeia* when dealing with historical performance practice are mainly that they offer a more systematic approach when shaping the musical gestures, whether they are ornamented with diminutions or not. The study of *Quantitas*

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[38] Marin Mersenne, *Harmonie Universelle*, Livre second des chants (Paris: S. Cramoisy, 1636), 167–68, quoted in George Houle, *Meter In Music, 1600–1800: Performance, Perception, and Notation* (Bloomington: Indiana University Press, 1987), 67.

could arguably be already present and included in the study of the metric accentuation of the bar, even though it is practically never mentioned specifically by name. When we are analyzing or performing music with more irregular patterns (as often happens in seventeenth-century toccatas or sonatas), *rhythmopoeia* is the champion of the tools.

I suggest the idea of "fractalic *Quantitas*" to acknowledge the multiple nested levels in which *Quantitas* operates simultaneously. The term "fractalic" describes well the fact that the hierarchical principles of *Quantitas* operate in a similar way at every level.

Figure 3.5. Nested rhythmic groups.[39]

This type of organization is a leftover from the highly complex mathematical relationships found in the multiple levels of mensural notation and the isorhythmic motet. Probably some the most notable examples of the applications of these late medieval and Renaissance compositional procedures in the late Baroque can be seen in the canons and fugues of Johann Sebastian Bach's *Musical Offering*. The musical subject that serves as source material for the entire composition is the following:

Figure 3.6. Berlin, Staatsbibliothek, Am.B 73, fol. [10] – 3v. Johann Sebastian Bach, *Musikalisches Opfer*, BWV 1079, subject.[40]

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[39] "Rhythmic groups may be nested hierarchically, and thus smaller groups may function as composite elements within a larger group." London, "Rhythm," §I, 3.

One of the canons in the Musical Offering, the *Canon a 2 per augmentationem, contrario motu* illustrates these multiple levels very clearly, since they are built on the same subject:

Figure 3.7. Ibid., fol. [20] – 2. Canon a 2 per augmentationem, contrario motu.[41]

The top part contains the subject with ornamental diminutions.[42] In the lower part we see the *signum congruentiae* (in the middle of the first bar), which indicates the entrance of the canonical part (not written here). The canon (rule) is to perform this part by augmentation and in opposite motion, that is, doubling the time values (*per augmentationem*) and moving in the opposite direction from what is written (*contrario motu*).[43]

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[40] Johann Sebastian Bach, *Musicalisches Opfer*, ([Leipzig], 1747), [10] – 3v, accessed August 3, 2019, http://resolver.staatsbibliothek-berlin.de/SBB000199A800000000.

[41] Ibid., [20 – 2].

[42] That is, the addition of passing ornamental notes in smaller time values (diminished), not to be confused with the temporal augmentation or diminution of a subject in which the time is doubled or halved while keeping the same notes.

[43] The way to execute this instruction is cleverly hinted at the beginning of the line with the addition of an upside-down treble clef, as well as an upside-down key signature, which gives a clear indication of the pitches to be played by the canonical entrance.

Example 3.9. Johann Sebastian Bach, "Canon a 2 per augmentationem, contrario motu," from *Musikalisches Opfer*, BWV 1079.[44]

A true augmentation of the canonic response would include bar-lines every other bar like Kirnberger mentioned, or even better, no bar-lines at all, as it was done in mensural notation. This would allow each line to preserve its own *Quantitas* scheme and to be phrased accordingly, without the potentially distracting factor of the bar-line, which would hint at a different *Quantitas* scheme (one that, as Kirnberger mentioned, would bring too many falsely accented beats). Indeed, in one of the two canonic lines time "flows more slowly," and the listener should perceive this augmentation in the way it is performed or delivered. It is not a matter of taking twice as long to play the subject, but of actually changing the musical gesture together with the duration.

Being well acquainted with the practice of diminutions is important when studying and performing Renaissance and Baroque music in particular (but not limited to those time periods), since a diminished line could potentially obscure its underlying architecture. This, in combination with *rhythmopoeia,* can more easily help us recognize this architecture, and therefore have a solid basis to make performing decisions regarding phrasing.

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[44] This version from the 1885 edition of the *Bach-Gesellschaft Ausgabe* "resolves" the musical riddle proposed by Bach, and shows the augmented part written out at the top. Johann Sebastian Bach, *Joh. Seb. Bach's Werke,* B.W. XXXI (Ann Arbor, Mich.: J.W. Edwards, 1947), 42.

We have now explored *hypermeter* and *diminutions* as two phenomena that relate to structures of musical material. The first defines larger structures by grouping a number of bars, and the other fragments a note into several smaller elements. The rules of emphasis stipulated by *Quantitas* apply to both of these levels of organization of the musical material in addition to the bar itself. But the importance of *Quantitas* is mainly that besides hierarchy alone it acknowledges rhetorical reasons why such patterns of emphasis should be applied. Thus *Quantitas* connects all these concepts with performance aspects of phrasing, delivery, and musical taste, which were so important during the seventeenth and eighteenth centuries. Together with *Quantitas*, *rhythmopoeia* offers another window into the organization of the musical material. *Rhythmopoeia* adds the possibility of recognizing underlying musical structures that are not bound to the symmetry or regularity of meter. Therefore, *Quantitas* and *rhythmopoeia* are optimal tools to approach the analysis and performance of Renaissance and Baroque music in particular, or other types of music that follow similar compositional and structural procedures.

In musical performance, highly refined interpretations are able to preserve the identity and shape (its *Quantitas* in a broad sense) of the smaller musical gestures while at the same time pursuing the longer so-called "line." But, what is the shape of that longer line? Or is there a shape at all? If a word has its own "musical" shape in speech, a series of words that constitute a phrase (including its commas and breaks, its primary and secondary emphasis) also have a "macro-shape" without erasing or reducing the shape of the original words, but rather placing them in a broader context.

The answer to the correct execution of a long line may lie in the performer's ability to understand its complex layered architecture (*hypermeter, rhythmopoeia, diminutions*). They must distinguish the components of the phrase: motifs, small gestures; then separate and shape them according to their *Quantitas*, while connecting them according to the *Quantitas* of the long phrase. Mattheson considered that this would give the necessary clarity to the melody, and insisted that,

it shall be further shown brightly and clearly that all long as well as short instrumental melodies must have their proper *Commata, Cola,* periods, etc., in the very same way as the song with the human voice. Otherwise, it is impossible to find a CLEARNESS therein.[45]

Quantitas has the unique characteristic that it is a theory and practice that encompasses the shape of both the small gestures as well as the long ones. Part of the criticism about over-Romantic phrasing when performing Baroque or Renaissance music is the fact that the small shapes are erased or "ironed" in the attempt to exaggerate the horizontal aspects (melody) of the writing.[46] There is music that benefits from that approach, but as we have seen earlier in this chapter, much Romantic music or even twentieth-century music still operates with contrapuntal and rhetorical tools proper of earlier times.

As we have seen, theorists generally agree that in music compositions groups of beats often behave like larger beats, bars behave like single beats, groups of bars behave like single bars, etc. The important question for a performer to answer is: at what level should the main "musical beat" or the gesture be felt?,[47] regardless of whether or not the notation reflects that. A good composition should reflect the different levels as clearly as possible in the writing itself, particularly with a clever choice of meter, as Kirnberger stated. But very often this is not the case, whether it is because the choices of meter are not ideal or simply because the notation system is limited in its capacity to represent all these levels properly. Performers need to be constantly aware that not all of the musical gestures will fit the suggested emphasis patterns of the bar, but many will instead (or in addition) go beyond it. In the case of vocal music, text can inform the identification of such larger shapes, whether it is at the level of the word or the phrase.

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[45] Harriss, "Johann Mattheson's," 503.

[46] Failing to shape the small musical gestures and perform the line with its proper 'incisions' (as Mattheson calls them) tends to be one of the main challenges of musicians that get introduced to historical performance practices after being highly trained exclusively in the "traditional" nineteenth century pedagogical approach to music making.

[47] Experience shows that musicians often discuss this in preparation to performance. For example, a common instruction of conductors in a certain movement is: "let's feel this in two", or "lets feel this in one", regardless of whether the piece is in four beats or three per measure.

In order to fully benefit from the rich and complex effects of "fractalic *Quantitas*" in performance, we need to let go of the idea that *Quantitas* operates only at the level of the bar. It is simply that around the time when its definition was coined, there was great focus on explaining metric accentuation. *Quantitas*, though, originates in the need to manifest and organize rhetorical emphasis in music.

Caplin considers that Kirnberger "left undiscussed […] the question of how these different accents actually exist together—both in performance and experientially—and even how to formulate a coherent theory of multiple accentuations."[48] The consideration of fractalic *Quantitas* may help reconcile these different theories in a way that can be integrated with theories of phrasing. This could offer a more helpful and comprehensive approach to the study, performance and preparation complex-layer music, like imitative polyphony, or cantus firmus motets, etc.

An interesting modern scientific study in musical expressivity further emphasizes the relevance of *Quantitas*. In his book *Hearing In Time: Psychological Aspects of Musical Hearing,* Justin London explores in detail the relationship between patterns of timing variation (in expressive performance) and the written values of the notes in the score, in order to formulate what he calls the *Many Meters Hypothesis*. He sustains that a skilled or mature musician would have acquired a large number of patterns of timing variations that he is capable of reproducing or applying to other pieces in the same style or genre in order to render them expressive in a similar way.[49] He equates these particular patterns to what in his view would be a distinct meter that the performer calls upon when needed, and a large number of these meters offer a large palette of expressive resources according to style or, what I consider, is very similar to the Baroque concept of *taste*. Indeed, the specific issue of timing variations or deviations from the score can be traced

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[48] Caplin, "Theories of Musical Rhythm," 670.
[49] See London, *Hearing In Time*, 142–160.

back all the way to the definition of *Quantitas* by Printz. More specifically, its correlation to character is stated very clearly by Kirnberger.

The proper execution of a specific meter thus expresses the right *affekt* of a piece. Not only the concepts of *affekt*, *Quantitas*, and character are closely related, but as Caplin asserts: "issues of duration, tempo, articulation, style, and genre are interwoven with those of meter,"[50] and the collective cocktail of those subtle variations manifest themselves in the complex phenomenon of musical expressivity.

Interestingly, in Justin London's study for our exploration of *Quantitas* these *Many Meters* or multiplicity of patterns of timing variation are like stored algorithms that the performer can call upon, and that are proper of a specific style or a specific performer:

> While these patterns of timing and dynamics may be highly particularized, they are not unique; they are replicable (i.e., when a performer plays the same piece on different occasions these same patterns tend to recur) and also transferable (i.e., when a performer plays a different piece in the same style and with some of the same structural aspects, they may be redeployed).[51]

London quotes a number of studies that "examine the timing patterns in musical performances with great precision and detail"[52] using modern technology, MIDI devices and other resources. In the same way that these studies mapped the timing deviations of expressive performances, I would suggest that considering the deviations described in the definitions of *Quantitas Intrinseca* (some subtle elongations or shortenings of notes according to the structure of the music) could help inform and produce tools that would render the performance of a MIDI sequencer more expressive, especially in a way that at least theoretically would be more coherent with the expressivity sought by the performers of the seventeenth and eighteenth centuries.[53]

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[50] Caplin, "Theories of Musical Rhythm," 669.
[51] London, *Hearing In Time*, 159.
[52] Ibid., 146.
[53] Actually, in one of the examples quoted by London the analysis showed that in a performance of Mozart's Piano Sonata K. 331 (in a 6/8 meter) the downbeats were not elongated and that the second half of the bar was, both things being contrary to *Quantitas*. However, this might be due to numerous reasons,

According to Eric Clarke, the deviations observed in performance are related to structural

characteristics of the music, and suggests that "the clocklike mechanism that times these beat

intervals is modifiable, or programmable, so as to vary its momentary rate."[54] This means that one

could imagine having, for example, a *Baroque expressivity tool* in a MIDI sequencer or in a

music notation software, provided that the right parameters have been programmed in order to

execute the deviations, including *Quantitas*. This could be applied also to a *jazz expressivity tool*

(swing), or other genres, and eventually specific performers if it were of interest. The applications

of such a tool may include producing computer-based performances that more closely mimic

more human expressivity in film music, for example, or other areas where MIDI sequencing is a

primary resource.

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starting by the fact that the study was done in 1983 and various factors may have influenced this particular type of expressiveness, like the training of the performers, the level of awareness of historical performance practice at that time, etc. It is quite possible that they might have captured specifically a romantically expressive rendition of Mozart's Sonata. Other factors may be related to the motive itself, which raises pitch and loses temporal momentum in the second half of the bar, inviting the performers to repose briefly before regaining momentum again in the next bar.

[54] Eric F. Clarke, "Structure and Expression in Rhythmic Performance," in *Musical Structure and Cognition*, ed. P. Howell, I. Cross and R. West (London: Academic Press, 1985), 209–36, quoted in London, *Hearing In Time*, 148.

(a)

| L | EE | LS | EEEEE | SL |

BEAT MARKERS
PROCEDURES

BEATS (AT 3 LEVELS)

NOTATION
IDEAL 101s (msec.)

1,000   500   500   750   250 200 200 200 200 200 250   750

(b)

| L | EE | LS | EEEEE | SL |
| | - + | + - | + - + | |

BEAT MARKERS
PROCEDURES
PROCEDURAL MODIFICATION

BEATS MODIFIED BY
PROGRAMMABLE CLOCK

"EXPRESSIVE" 101s (msec.)

930   400   490   860   150 280 260 195 260 295 200   600
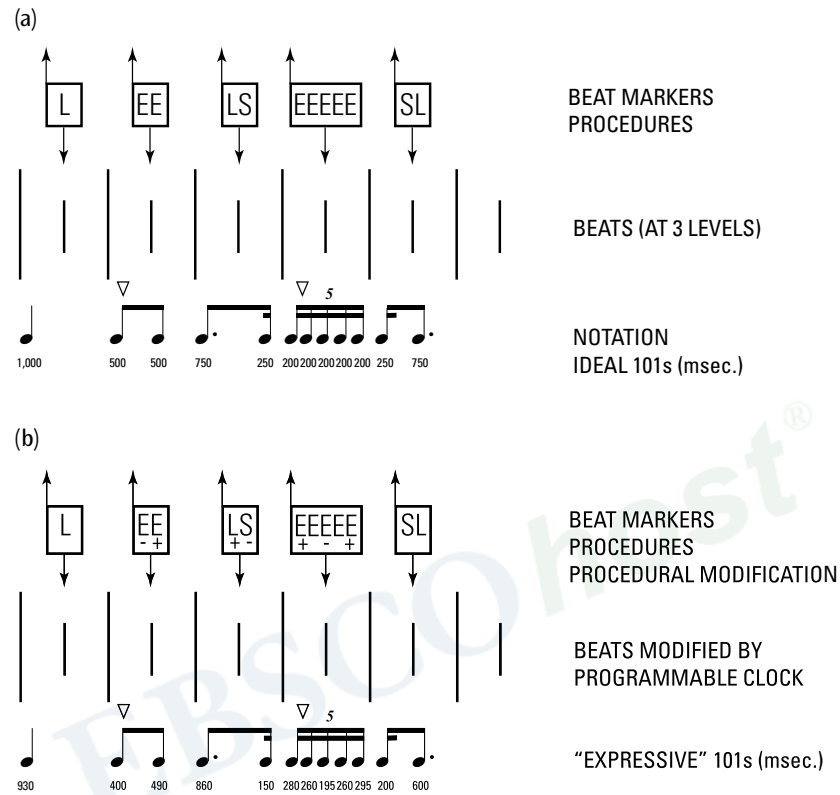
Figure 3.8. Differences in canonical and expressive timing.[55]

London also mentions that "there is an entire area of computer-music research the goal of which is a system that would take musical sound as input and produce a notated score as output."[56] Once again, it seems very relevant that such research takes in account *Quantitas* as one of the expectations (and guidelines) that so many theorists of the eighteenth century considered vital to the correct expressivity of the music of the time.

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[55] London, *Hearing In Time*, 149.
[56] Ibid.

Conclusions

Quantitas intrinseca describes a musical phenomenon directly connected to the rhetorical nature of music. Making music delivery equivalent to the speech of a good orator was a central topic in the Renaissance and has remained part of the musical discourse until today. We have seen, however, how Printz's formulation of the concept coincided with the emergence of a new understanding of time in music, which in turn "buried" *Quantitas* among discussions of meter, accentuation and articulation. But there is great value in approaching seventeenth and eighteenth century vocal repertoire in particular with the theoretical resources of the time. If anything, it helps us reach a more balanced picture of the sonorous realities and priorities of the composers, and in many ways, be more coherent with style. This does not mean that modern theoretical tools are invalid when working with this repertoire, but there is a bigger risk to lean heavily in priorities that are anachronistic.

The modern conductor has numerous advantages when understanding and applying the principles of *Quantitas* to the preparation process of a piece, in particular of ensemble vocal music of this period. There is also a great amount of repertoire from other epochs that share enough compositional principles with this repertoire so that the application of *Quantitas* results in a valid and helpful musical resource. It is particularly interesting to look at the potential of *Quantitas* to create a cleaner and more transparent texture in imitative polyphony. When we deliberately acknowledge and calculate the shortening of certain unemphasized notes (or as other theorists referred to: passing notes, bad notes, *short* notes), we naturally clear the path for another counterpart to pass through the texture. This approach based on articulation seems more effective than shaping the line through dynamics, which is very common today. Actually, many sources, in particular the ones for instruments with limited or no dynamic range like the keyboard or flute, support this idea.

Certainly, the final decisions regarding the application of these principles have to be informed by many other factors, but *Quantitas* seems to offer an all-encompassing approach that can function at the level of the motif, the bar, hyperbar, the phrase. That is why I consider that it indeed operates in a way that could be labeled as Fractalic *Quantitas.* The closely related concept of *rhythmopoeia* offers an important insight as well into the architecture of music and the structures that hold a musical line. That is why *Quantitas* together with *rhythmopoeia* can be considered the root of modern concepts like meter, hypermeter, Schenkerian analysis, and phrasing theory.

Quantitas should be studied and deliberately used more frequently in academia and performance. Hopefully this study can offer an initial step to understanding the practice of shortening notes and marking scores that many tasteful conductors have successfully integrated, and at the same time provide a theoretical frame to pursue it.

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