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GIVING MOZART HIS LINGUA FRANCA:
A QUEST FOR MEANING IN THE DA PONTE OPERAS

BY

STEPHEN RODNEY CALDWELL

THESIS

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Musical Arts in Music
with a concentration in Music Composition
in the Graduate College of the
University of Illinois Urbana-Champaign, 2023

Urbana, Illinois

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ABSTRACT

This thesis presents a multivalent analysis of musical meaning in relation to the three Mozart-Da Ponte operas: *The Marriage of Figaro*, *Don Giovanni*, and *Così fan tutte*. To engage the question of musical meaning in as many respects as possible, a broad and interdisciplinary approach across various fields—music theory, musicology, aesthetics, psychology, and computer science—is designed to acknowledge the myriad domains in which music exists and potentially transmits some form of meaning. Opera complicates the extramusical and intramusical aspects of music through multiple creators (at least composer and librettist) and conduits (music, plot, text, and staging) borne from, and speaking to, a particular social context; which when taken together, create a vast sea of potential meanings. The written, musical score is thus not a whole and bounded object to be attended by conventional theory alone, for the social meanings it may impart reside at least partially in the audience, or social context, which not only births, but beholds its progeny. Engaging the listener's domain raises notions of perception and experience which yet further complicate meaning. The tacit belief in not only the primacy, but wholeness of the intramusical, cannot be allowed to persist; for in assuming each interdisciplinary perspective, corresponding meanings are allowed to emerge, leading repeatedly to the conclusion that each is but a mere reading of infinite meaning. The lack of macro-level, comparative analysis between the Mozart-Da Ponte operas in their entirety is a striking gap in existing scholarship which the present study seeks to address. The profoundly macro scope which this entails is facilitated by computational means; specifically, low-level feature extraction, which instantiates a digital domain amenable to comparative analysis. In relation to the segments extant in disparate domains—and especially, that of tonal planning—peaks in extracted features can be seen to act as structural articulations at the macro level.

ACKNOWLEDGMENTS

There are countless individuals who have made this work possible. My wife; who has always seen me with such arresting clarity, and who with steadfast love set me on this path so many years ago. My family—parents, grandparents, aunts, uncles, cousins, and in-laws—who have so profoundly shaped me, and continue to model a life well-lived. My faith; an anchor always. My teachers; whose love of knowledge has inspired and challenged me continually. My friends—from back home in Ohio, to every school thereafter—who illuminate this life while on our journeys together. My interests; the books, movies, music, video games, and hobbies which are like companions to me.

High school band was a sanctuary for me, thanks especially to its director, Dr. Darren LeBeau. My first saxophone lessons teacher, Mr. Ted Peplowski, saw how much I loved composition, and soon our lessons became all about music theory. Dr. Lee Heritage and Dr. David Jex of The University of Toledo gave me an incredible opportunity to study composition as a master's student; and despite my undergraduate degree in biomedical engineering, they always believed in me. Lastly, the music professors at the University of Illinois gave me the chance to study at the doctoral level; and challenged me to grow in new ways which have forever changed me as an artist and scholar. Among whom, the kind support and knowledge of Dr. Eli Fieldsteel has been an invaluable resource at all times.

To Isabella, and the late-night walk

When we dreamed of this together

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: MUSIC THEORY WITH MUSICOLOGY AND AESTHETICS.....	8
Topic Theory.....	8
Background.....	29
Case Study: <i>Don Giovanni</i>	91
CHAPTER 3: MUSIC THEORY AT THE MACRO SCALE.....	108
Tonal Planning.....	108
The Syntax of Play.....	132
CHAPTER 4: MUSIC THEORY AND PSYCHOLOGY.....	145
Toward Listener-Based Music Theories.....	145
The Psychology of Listening.....	158
CHAPTER 5: MUSIC THEORY AND THE DIGITAL.....	180
Methodology / Music Information Retrieval.....	180
Results and Discussion.....	216
CHAPTER 6: CONCLUSION.....	250
BIBLIOGRAPHY.....	260
APPENDIX A: Audio Track Listing.....	265
APPENDIX B: Original Composition: <i>A Clash in the Defeating Stillness</i>	271

CHAPTER 1: INTRODUCTION

The initial impetus for the present research stems from a hypothetical question: if one wishes to “write like Mozart”—but in a different style—how would it translate? This leads to the broader question of whether *any* music contains core ideas, or fundamental content, which is not only fixed, but divisible from its original style and context. Just as an act of conventional language translation attempts to sacrifice as little of the core meaning as possible between two languages, so too does this study hypothetically require the core meaning of “Mozart” as a prerequisite for musical translation. The pursuit thus becomes an investigation of musical meaning, and in what manner it may exist or be understood. For if there is a shadowy interior which can be liberated from the particulars of its exterior, then a framework for just such a translation may be exposed, like a musical *lingua franca* which preserves essential meaning.

To engage the question of musical meaning in as many respects as possible, a multivalent approach is assumed for the present research which structures the text into four chapters: musicology and aesthetics; the macro scale; psychology; and the digital. This approach is designed to acknowledge the myriad domains in which music exists and potentially transmits some form of meaning. Since conventional music theory has historically engaged the intramusical aspects of music alone—and thereby imposed its fundamentally formalist bias on the notes themselves—the tacit belief in not only the primacy, but *wholeness* of the intramusical, has been allowed to persist. Furthermore, the cult of genius traditionally foisted upon prominent composers, especially those of the classic and Romantic eras, can be seen as a natural buttress to the written score. With authorship and score secured together, the artistic object becomes a whole and bounded object, one of fixed meaning which can exist as an unfaded, untarnished monument extending through ages immemorial. The marginalization of the extramusical is an

inevitable result to this manner of thought, as it is reduced to mere filigree on the pedestal of independently complete works. Through recent decades however, this imbalance has been gradually redressed in favor of a more complicated view of musical works—one which accounts for extramusical considerations such as social context, performance practice, aesthetics, human perception, and practical concerns. Regarding the extramusical as less of a frame for a painting, and more of an unavoidable lens through which to view it, has the corresponding effect of entwining musicology with music theory, and eliminating any notion of parallel pursuits. Leonard G. Ratner’s topic theory, for instance, is a prime example of such entanglement, as it describes how music in the classic era could be externally referential by exhibiting socially-recognizable features, such as “music of the hunt,” and “learned style.”¹ These topics are intramusical features which have extramusical meaning only in a particular social context, and are more generally demonstrative of a sort of interstitial meaning easily lost through different eras and cultures. By observing the notes alone, even conventional music theory—which is perhaps best suited for the classical style—omits such meaning, and is thus insufficient by itself.

In operatic studies in particular, the multifarious nature of music is foregrounded; poiesis, or the act of creation, is not only distributed across composer and librettist, but strongly influenced by the impresario, stage managers, vocalists, particular theaters, audiences, and so on. This disrupts the notion of sole authorship with its ostensibly cohesive intentions, and supplants it with something like a poietic web. The dramatic aspects of opera, such as plot, text, and staging, are likewise not attendant to the score alone, but alternately independent and dependent, conflicting and coordinated. Operatic analysis must therefore account for a great number of factors while also resisting the formalist urge to add everything up to some type of grand and

¹ Leonard G. Ratner, *Classic Music: Expression, Form, and Style* (New York: Schirmer Books, 1980).

unified structure of proven artistic worth. That is, opera provides an investigation of meaning, such as the present one, with multiple creators (at least composer and librettist) and conduits (music, plot, text, and staging) borne from, and speaking to, a particular social context; which when taken together, create a vast sea of potential meanings. In some sense, opera heightens and makes more explicit the extramusical fabric extant in instrumental music, and so the analysis of one should not be taken for irrelevant to the other, but that the materials in question should yet suggest some level of idiomatic approach. Analysis should not be insouciant to its materials, and the present research thus aims at every juncture to respond to the Mozart-Da Ponte operas in particular—the choice of which will be discussed presently.

With regard to the aforementioned monuments of art so often hewn into the annals of time, perhaps no more prototypical statue can be found than that of Mozart. While the other commonly-regarded masters, such as Bach and Beethoven, are of arguably equivalent status, neither has a large body of operatic work. The operas of Mozart are not only numerous, but highly regarded in both repertoire and scholarly studies. And for an interdisciplinary study such as this one, the possibility that various non-musical fields intersect can be greatly increased by the choice of well-known and extensively studied composers and works. Mozart collaborated with the same librettist, Lorenzo Da Ponte, on three occasions—producing *The Marriage of Figaro* (1786), *Don Giovanni* (1787), and *Così fan tutte* (1790)—which together, are occasionally referred to as the Da Ponte trilogy, or cycle. Using this famous trio of operas not only increases the likelihood of interdisciplinary overlap, but since they are all by the same pair, it also lends some added consistency to what is otherwise a study with many disparate variables across roughly nine hours of runtime. The lack of macro-level, comparative analysis between the operas of the Da Ponte trilogy is a striking gap in existing scholarship which the present study

seeks to address. Perhaps due to the considerable duration of material, the operas are most often treated in excerpts alone, while any apprehension of their totality is left to musicological rather than theoretical pursuits. The macro scope which this study assumes is facilitated by a computational approach known as *feature extraction* which measures an audio signal in various ways. The use of “low-level” feature extraction in particular is very common within the field of music information retrieval (MIR), where it is but a single component in a multitude of tasks; but its use in music analysis is a relatively rare concept which has previously been spearheaded in a study by Tuomas Eerola.² Used as a basic model for the computational portion of the present research, Eerola’s work is adapted for the purposes of multivalence and much longer timescales.

In conjunction with computational methods, which are readily capable of handling large swaths of music, there are a few types of conventional, manual analysis applicable at the macro scale. As Mozart has often been viewed through the lens of genius, the analysis of his music has accordingly been susceptible to notions of grand design; and as such, there is a long historical precedent for the macro analysis of Mozart’s operas—and especially by tonal planning. Generally defined, tonal planning is the symbolic use of key to refer to aspects of the plot (events, characters, and so on); and/or the intentional organization of keys to create structure and macro form. Especially in terms of the latter aspect, or the organization of keys, claims of tonal planning have unsurprisingly tended to be formalist in nature, stressing the structural coherence of works while also asserting semblance to instrumental forms. But toward the close of the twentieth century, tonal planning studies began to call for a higher standard of proof, with writers such as John Platoff and James Webster leading the reappraisal. Webster’s support for idiomatic, multivalent operatic analysis is a foundational tenet to the present research—as are Platoff’s

² Tuomas Eerola, “Analysing Emotions in Schubert’s *Erlkönig*: A Computational Approach,” *Music Analysis* 29, no. 1/3 (March-October 2010): 214-233.

lucid observations on the “myths and realities” of tonal planning.³ By accounting for much more than the notes alone, rejecting aesthetic principles like the valorization of unity, and questioning the perceptibility of temporally distant tonal relations—previously disregarded contextual factors emerge as significant. Foremost among these factors are conventional key associations and the limitations of historical instruments, but more broadly, it again connects the discussion to considerations of musicology, aesthetics, and psychology.

With the instantiation of perceptibility in particular, a clear connection with empirical studies in psychology can be made. Representing the final thread of the present research yet to be discussed, cognitive studies tend to foreground the role of the listener by emphasizing the cognitive process, and thus can offer novel approaches to music theory. The common tendency to use empirical studies only as validation tools for music theory somewhat undermines what could otherwise be a dialogue of disparate perspectives. It is too easy to uncritically assume correspondence between the written page and cognitive process, and to likewise develop theories in one domain which hold no bearing in the other. In this sense, cognitive psychology is used as a natural foil in the present research for the various theoretical, aesthetic, and even musicological perspectives which retain a latent written-music bias, and thereby obscure what might be understood as listener-centric meaning. Special attention in this section is afforded to Gestalt psychology—which is generally-speaking a perception theory on group formation—as it has a rather extensive history in music perception studies, and underlies many of the sources covered. The work of Irène Deliège in this area occupies a central position, as it stresses how listener attention is more directed toward distinctive surface features than temporally distant relations,

³ James Webster, “Mozart’s Operas and the Myth of Musical Unity,” *Cambridge Opera Journal* 2, no. 2 (July 1990): 197-218; John Platoff, “Myths and Realities about Tonal Planning in Mozart’s Operas,” *Cambridge Opera Journal* 8, no. 1 (March 1996): 3-15.

and how cognitive economy is handled in a continuous process of memory recall and comparison.⁴ In her own work, and that of many contemporaries, Deliège's "cue abstraction" model has continuously privileged local similarity over structural features—especially in the creation of a mental schema, or auditory image, which represents a musical piece. Given that the present research entails the macro analysis of three full-length operas, great effort will thus be made to attend to the local existence and perception of music.

Returning to the opening thought experiment, or the task of musical translation, the need to preserve fundamental meaning was raised—begging the question of what such meaning might be, and whether it may even exist in any definable sense. If this task is to be taken seriously, the fully-comprehensive view it requires could preclude its very possibility; but it is also through this same perspective that the analysis of meaning-making can be engaged most holistically, and multivalently. In Chapter 2, the intersection of music theory with musicology and aesthetics is considered; yielding discussions on semiotics, topic theory, social context, and dramatic content which culminate in a case study on *Don Giovanni*. In Chapter 3, music theory at the macro scale is considered; beginning with an examination of tonal planning and aesthetic value, before moving to the extensive use of playful syntax in Mozart's work. In Chapter 4, the intersection of music theory with psychology is considered; including listener-based theories from within the field of music, before proceeding to empirical studies of cognition and perception. In Chapter 5, the intersection of music theory and the digital is considered; providing background for the use of feature extraction in methodology, and subsequently connecting the results of the analysis to the rest of the paper in general. Taken as a whole, these various threads constitute a multivalent analysis of musical meaning in relation to the Mozart-Da Ponte operas in particular; and through

⁴ Irène Deliège, "Cue Abstraction as a Component of Categorisation Processes in Music Listening," *Psychology of Music* 24 (1996): 131-156.

the execution thereof, meaning will be revealed as so multitudinous and changing as to be impossible to behold—a numinous specter unfathomed. No matter the level of comprehensive view assumed, any analysis is still but a single reading subsumed in the inky depths of infinite meaning, and the present study is no exception.

CHAPTER 2: MUSIC THEORY WITH MUSICOLOGY AND AESTHETICS

Topic Theory

There are many lenses through which to perceive music: theorists see notes, musicologists see people, psychologists see minds, linguists see words, philosophers see aesthetics, computers see data, and so on. In such disparate manners, music demonstrates it can be flexibly read as an expression of nearly (or truly) infinite meanings. But the predominant concern with *what* music means may ultimately be less fruitful for scholarship than *how* music generates meaning.⁵ Musical semiotics foregrounds this question of “how,” and although it was only formalized relatively recently in the twentieth century, many prior and contemporary works without an explicit semiotic label can still be viewed as such. In his landmark 1991 work, V. Kofi Agawu gathers the threads of music theory and linguistics (especially in the works of Leonard G. Ratner and Charles Rosen) and unites them under the banner of semiotics.⁶

Semiotics is a notoriously nebulous and taxonomy-heavy study which resists a simple definition. This is compounded by competing notions of semiotics itself, but the general idea is that mental concepts and physical phenomena are linked through referential signs.⁷ For example, the word “dog” is used to signify the real-world animal, allowing speakers of the English language to interpret the word into a mental concept. This arrangement can be understood as two halves: the *signifier* (which is the word “dog” itself) and the *signified* (which is the concept of a dog). Another common example is from medicine—a particular symptom can signify a medical ailment. In many cases, signs are not the sole vehicles of symbolic communication, and can be

⁵ V. Kofi Agawu, *Playing with Signs: A Semiotic Interpretation of Classic Music* (Princeton, NJ: Princeton University Press, 1991): 5.

⁶ Agawu, 10, 13.

⁷ Agawu, 16.

placed into a taxonomy of icons, indices, and symbols; but again, definitions vary from writer to writer, with many choosing to forgo these terms entirely. Due to a lack of accepted definitions, semiotics can be difficult to conceptualize, but at its core it is simply a study of signs and meaning-making which can be applied to myriad fields.

Semiotics is perhaps most-naturally given to language studies, which the above example of “dog” may imply, but as Agawu points out, many recent and prominent music theorists (such as Ratner, Rosen, Leonard Meyer, Fred Lerdahl, and Ray Jackendoff) have persistently sought “shadowy” linguistic analogies.⁸ Agawu looks back further, remarking that this is not merely a recent development in music theory, as language-based approaches date back to at least the seventeenth century.⁹ Through the years, music has been conceived alternately as a speech obeying the rules of rhetoric, or as a language obeying the rules of grammar, but the analogy has remained both frustratingly loose and axiomatic. Agawu reasons that semiotics could provide a more defined link between music theory and language, especially when applied to the conventions of the classical era, and it is this pursuit which occupies the bulk of his work.

Agawu divides signs into two categories—extramusical and intramusical—which coexist and interact in real-time, so as to reinforce and clarify meaning.¹⁰ Extramusical signs are adapted from Ratner’s concept of “topics” while intramusical signs are adapted from Schenkerian analysis, and the resulting interaction between these topical and structural signs is understood through semiotics. Agawu furthermore ascribes musical expression to surface-level extramusical signs, and musical structure to underlying intramusical signs. In short, extramusical signs are topics drawn from the referential surface, and they generate expression. Intramusical signs are

⁸ Agawu, 7.

⁹ Agawu, 11.

¹⁰ Agawu, 17-20.

tonal features drawn from the nonreferential foundation, as found through Schenkerian analysis, and they generate structure. The topical surface is validated by the underlying, intramusical structure, and vice versa; ultimately, meaning is derived from this interplay. This approach is particularly intriguing, as it acknowledges how readily signs can go unnoticed in a modern context, rendering meaning lost. Agawu elaborates as follows:

The point of a semiotic analysis, then, is to provide an account of a piece, in which the domains of expression (extroversive semiosis) are integrated with those of structure (introversive semiosis)...It is the dialectical interplay between manifest surface and structural background that should guide the analysis. And it is only within such a framework that we can appropriately acknowledge the rich and subtle meanings that underlie the deceptively simple and familiar music of the Classic era.¹¹

Extramusical Signs: Topics, the Referential Surface, and Expression

Given the significance of signs to Agawu's work, a more robust discussion of each category is warranted. Extramusical signs (or, extroversive semiosis, as in above quote) will be covered presently, and then followed by a discussion on intramusical signs. Agawu begins by providing a list of extramusical signs, or topics; and he is careful to qualify that it is not comprehensive, but represents a growing collection, included below.

Figure 2.1. The topics identified by Agawu's *Playing with Signs*¹²

- | | |
|---------------------------------|---------------------|
| 1. alla breve | 12. gavotte |
| 2. alla zoppa | 13. hunt style |
| 3. amoroso | 14. learned style |
| 4. aria | 15. Mannheim rocket |
| 5. bourrée | 16. march |
| 6. brilliant style | 17. minuet |
| 7. cadenza | 18. musette |
| 8. sensibility (Empfindsamkeit) | 19. ombra |
| 9. fanfare | 20. opera buffa |
| 10. fantasy | 21. pastoral |
| 11. French overture | 22. recitative |

¹¹ Agawu, 24-25.

¹² Agawu, 30.

Figure 2.1. (cont.)

23. sarabande

24. sigh motif (Seufzer)

25. singing style

26. Sturm und Drang

27. Turkish music

The topics above can further be divided into two categories according to what is referenced.¹³

Topics in the first category refer solely to musical *types*, such as dances and marches (minuet, sarabande, polonaise, gavotte etc.). These topics can alternately be incorporated into other musical types, or function as standalone sections; for example, the minuet may be alluded to within a sonata, or the minuet may instead form an independent section explicitly labelled as such. The second category of topics consists of references to musical *styles*, such as military and hunt music, fanfares, singing style, Sturm und Drang, learned style, fantasia, and so on. In short, musical types provide structure to the music itself, while musical styles are simply incorporated into structures; but the distinction between these two categories, as set forth by Ratner and furthered by Agawu, is intentionally blurred, or flexible.

For example, the French overture and fantasia are listed as styles—which would indicate that they do not structure music or occur as independent sections—but both can occur as independent sections, and arguably as forms too. While other examples are less ambiguous—march is listed as a type and hunt music as a style—the question emerges whether the type (that is, form) and style of music can truly be separated, since one informs the other. Furthermore, the implication that form and style can be independently perceived by a listener seems tenuous, especially when their significant overlap is taken into account. Beginning with Ratner and extending to subsequent writers in musical semiotics (Agawu included), the allure of creating a detailed taxonomy often leads to a mess of definitions that is not only cumbersome, but wholly without

¹³ Agawu, 32.

advantage. This is not to say that categories are never beneficial—but that when their distinctions break down, they no longer serve their intended purpose of organization. For the present study, the distinction between categories of topics is thus treated as an unnecessary and easily discardable component of topic theory.

Categories aside, it should be noted that Agawu and Ratner’s topics are not necessarily equivalent. Agawu reconceptualizes Ratner’s topics as semiotic signs, and expands their structural potential by emphasizing the interplay of topics.¹⁴ Identifying the presence of a topic becomes just the first step in plotting out a higher-level succession of topics, which ultimately forms a narrative throughline or discourse. This harkens back to the original, non-musical definition of “topic”—as found within the classical field of rhetoric—where a series of conventional topics provided a formal framework for discourse. Agawu’s treatment of topic is roughly analogous here, as his musical analysis focuses on how topics follow each other, and how they can be used simultaneously as well, varying between the foreground and background; thereby creating what is loosely termed a non-programmatic plot. That is, the succession and interplay of topics is regarded as an important layer of associative meaning available to the analyst and listener, and only through awareness of this referential musical discourse can a fuller view of total musical meaning be apprehended.

Agawu also introduces gradation to topics, as he treats them like paradigms which can be fitted in degrees of magnitude. Topical clarity can thus be clearly marked or faintly alluded to depending on what characteristics are present. Agawu elaborates on this, stating that topics are “defined by certain invariant characteristics whose presence alone guarantees the topic's identity. That is, a given topic may assume a variety of forms, depending on the context of its exposition,

¹⁴ Agawu, 34.

without losing its identity.”¹⁵ In short, core characteristics ensure the identification of a topic, while additional characteristics clarify and emphasize the topic. But aside from the degree of clarity or magnitude for a single topic, Agawu argues that in the cooccurrence of topics, some can override others. Taking into account this factor of precedence or strength, a hierarchy of topics can also be created, aiding in the development of the aforementioned plot.¹⁶ For Agawu, topics are semiotic signs which present a line of communication, or a conceptual discourse. And just like the so-called primary musical parameters (melody, harmony, and rhythm) must be understood and validated in the context of the secondary parameters (texture, timbre, and register); so too must extramusical signs not be considered alone, but be validated by intramusical signs.

Before discussing intramusical signs, it must be briefly noted that the seemingly straightforward integration of topics into the larger field of musical analysis, as proposed above, is somewhat hindered by Agawu’s lack of comprehensive information. First, Agawu does not acknowledge, or may not be aware that the manner in which he categorizes topics is essentially synonymous to what is known in cognitive science as prototype theory. In this theory, the gradation, or centrality of membership to a category is determined by certain traits, with the most-typical member being named the prototype. Agawu’s description of the invariant and supplemental characteristics of topics, and their resulting degree of clarity, fits precisely under prototype theory. But Agawu neglects to list the defining and optional traits for each topic, and similarly does not create a complete hierarchy of topical precedence—that is, which topics take precedence over others. Although musical examples are plentiful throughout the text, larger analytic designs are often left shadowy or deemed self-evident, and the reader is left to assume

¹⁵ Agawu, 35.

¹⁶ Agawu, 39.

unguided analysis. Even the divide between nonreferential (harmonic-structural) and referential (surface-topical) signs is subject to some overlap, as topics can also provide structure in certain cases. For example, musical types such as marches and dances, as listed above, not only refer to extramusical concepts, but also to specifically musical forms. The result is that the labelling and delineation offered by Agawu sometimes appears confusing, questionable, difficult to apply, and possibly even ahistorical, given that contemporary composers did not define topics in nearly so rigorous a manner.

Intramusical Signs: Schenker, Nonreferential Tonal Relations, and Structure

While topics comprise the first, extramusical class of referential signs, the second class is formed by “pure” intramusical signs. Agawu refers to these signs as nonreferential, but this can be somewhat misleading, as they are nonreferential with regards to extramusical associations alone. Intramusical signs “provide important clues to musical organization through conventional use”; and so, can be understood as conventions of structure.¹⁷ Furthermore, intramusical signs are based on the synthesis of Schenker’s *Ursatz* ($\hat{3}$, $\hat{2}$, $\hat{1}$ over I, V, I) with formal function, or the rhetorical beginning-middle-end paradigm.

Though Schenkerian analysis typically applies the *Ursatz* on a macro level, thereby treating the musical object as an organic whole, Agawu argues that this overlooks significant aspects of local structure; stating, “Classic music depends as much on contrast, conflict, and the juxtaposition of ideas as on organic continuity and articulation.”¹⁸ As such, Agawu does not directly apply Schenkerian analysis, but adapts it for more local levels by combining it with rhetoric. An individual melodic theme, for example, can be explained in terms both rhetorical

¹⁷ Agawu, 51-53.

¹⁸ Agawu, 51.

(beginning-middle-end) or harmonic/Schenkerian (home-away-home); and when combined, can clarify each other's functions and constitute a unified, purely musical sign. The beginning section provides stability and is defined as a *statement*, which gives way to an unstable middle section defined as a *process*, which finally gives way to an ending section of stability defined as a *restatement*. While the beginning departs from "home" and the ending returns to it, the middle remains "away" throughout, and is thus open at both sides—whereas the other two are only open at their inner faces.

As aforementioned, Agawu's reason for introducing rhetoric to Schenkerian analysis is with regard to Schenker's fundamentally "organicist bias" which—according to Agawu—does not account for the periodic and discursive surface of classical music. But there is a more covert reason underlying the discussion, and that is to connect intramusical signs with the first class of signs, or topics. This stream of referential signs—which can explain the surface, and even loosely instantiate a sort of "structural rhythm"—does not alone account for the structural form of classical music. Intramusical signs, on the other hand, provide important structural information according to convention, which allows the listener to recognize beginning-middle-end functions. Following this rationale, it becomes clear that one must not only explain both the topical surface and harmonic foundation (which together form the totality of a piece's semiotic signs) but also unify the approach to both classes of signs. Simply put, Agawu uses *rhetoric* to connect the approach to the two worlds of pure and referential signs. Topics thereby engage in a rhetorical and allusive discourse, which is structured by the rhetorical functions of beginning-middle-end superimposed on the *Ursatz*.

Extramusical/Intramusical and Expression/Structure

The body of Agawu's study is devoted to the semiotic analysis of works by Mozart, Haydn, and Beethoven. Through demonstration, the process is worked out and further detailed, revealing how the interplay of extramusical and intramusical signs becomes that of expression and structure, respectively. But these case studies still do not amount to the aforementioned lists or hierarchies frequently implied by the conversation, but never enumerated by it. In his concluding chapter, which serves to collate and outline the theory of musical semiosis, Agawu argues that it is fundamentally an interpretive theory which intentionally resists formalization. In this sense, to bemoan the lack of a concrete and comprehensive theory is to partially misunderstand Agawu's theory, which is necessarily as fluid as the content it analyzes. The structuralist nature of most musical analysis tends to favor structuralist readings of music itself, while also rendering surface features subordinate or even absent. In short, the analysis imprints itself upon the results. Repeatedly, Agawu makes appeals to the oft-overlooked musical surface while also rejecting any systematic, or structuralist, formulation of his own theory. Agawu even addresses what some may deem a lack of completion, stating:

Some aspects of music analysis are easier to formalize than others, but the degree to which a particular theory can be formalized may have no bearing on the value that it holds for musicians...The aim here, however, is not to reduce the entire music-analytical enterprise to mere rhetoric, but to facilitate a better understanding of how we understand Classic music.¹⁹

But if Agawu's above claim—that his semiotic analysis is fundamentally interpretive—is to be accepted, then the vast and imposing taxonomy, which he subsequently uses to describe the theory itself,²⁰ appears starkly incongruous to this claim. What remains is a theory that is internally divergent; it is both systematic and interpretive, while the interface between them is

¹⁹ Agawu, 127.

²⁰ Agawu, 127-134.

uncertain at best. It is this troublesome mismatch of strict methods and free materials which renders any direct reproduction of Agawu's methods so uncertain.

The arguments, as made above, should not be taken for a complete dismissal of Agawu's work, but against their direct application alone. In fact, the sheer premise of a semiotic reading of music—that is, understanding how musical meaning is produced—can even be regarded as a cornerstone of the present study. Agawu critically engages with meaning-making in the context of the classical era, and seeks musical understanding in a manner which, regardless of his specific analytic approach, is profound and informative. While the present study is not explicitly semiotic, it does stress considerations of meaning-making through the interdisciplinary angles of music theory, musicology, psychology, aesthetics, and the digital. In various degrees, these threads can be traced back to Agawu, whose works stands in the context of the present study as an intersectional and foundational source.

* * *

While topic theory in the hands of Agawu becomes semiotic, or sign-based, there are numerous other transformations which have been entertained through the years. An especially notable case of topic theory can be found by Robert Martin in the field of musical aesthetics; and more specifically, with regards to emotional expression.²¹ It should be noted that emotional expression in this sense is not as invoked within the listener's mind (for this would be under the purview of cognitive psychology) but as within the music itself. The two fields, aesthetics and psychology, are distinct in terms of focus (music vs. mind) and approach (philosophical vs. empirical); yet also closely related, and somewhat overlapping in terms of the subjects covered.

²¹ Robert L. Martin, "Musical 'Topics' and Expression in Music," *Journal of Aesthetics and Art Criticism* 53, no. 4 (Autumn 1995): 417-424.

Vast swaths of the present research are thus devoted to both fields, as their dissimilar perspectives often create fruitful convergences for interdisciplinary research.

Introducing musical topics to aesthetics, Martin is careful to delineate aesthetic stances according to whether emotion lies in the music itself (this is the stance Martin takes), whether features in the music induce emotion in the listener (the stance of Leonard B. Meyer, for instance), or elsewhere altogether. Within cognitive science, this is known as *locus of emotion*²² and is discussed at greater length in the Methodology section of this study. Martin evaluates whether topics contribute to emotional expression, and whether they can be utilized to address the more general, and particularly intractable, aesthetic debate surrounding emotional expression in classic music.

First, Martin loosely defines topics as, “allusions within a piece of music to well-known kinds of music associated with various social settings...familiarity with them, and with their associations, could be assumed by Mozart and other composers; so they provided a musical link to the extramusical.”²³ In this definition there is the underlying implication that topics are, in fact, a subcategory of musical quotations—as they are not referencing a specific piece, but an archetypal depiction of genre. Topic as generic quotation is a fascinating premise argued by Martin, and which leads him to a larger discussion on musical quotations in general.²⁴ The similarity between musical quotations (such as Mozart quoting Bach) and topics (such as Mozart quoting church music) is that both demonstrate the *connectedness* of a piece—even in an instrumental and abstract work—with the outside world.

²² Tuomas Eerola and Jonna K. Vuoskoski, “A Review of Music and Emotion Studies: Approaches, Emotion Models, and Stimuli,” *Music Perception: An Interdisciplinary Journal* 30, no. 3 (February 1, 2013): 310.

²³ Martin, 417.

²⁴ Martin, 419-420.

It should be noted that the linking of topics and emotional expression, which Martin specifically criticizes Wye Allanbrook for supporting, is clearly established in Ratner's original definition from the start.²⁵ Martin in this sense somewhat misdirects the entire argument toward Allanbrook, but this does not radically alter the cogency of Martin's point, as it is just as easily applied to Ratner. Topics as tools of emotional expression stem from the conventional social settings to which the topics refer; given that these settings may be associated with certain emotional responses, topics may thus be used to evoke corresponding emotions. But Martin draws serious issue with this claim, arguing the following points: that many topics seemingly have a neutral emotion (such as learned style); that musical passages devoid of a topic can still be expressive; and that music which intentionally contradicts a topic can alter the meaning of that topic entirely, creating a sort of subtext or added commentary. Martin goes on to claim that the standard of proof has not been met by Allanbrook, stating "even if, in some cases, these associations have to do with human emotions, it does not follow that the music expresses or refers to these emotions... Topics are neither sufficient nor necessary for the expression of emotions."²⁶ But if expression does not originate from topics, then the question of its origin remains unanswered—an issue which Martin later addresses.

In regard to topics and the emotions with which they are associated, Martin remarks that no definitive list has been proposed or made explicit by writers operating in topic theory. Martin then proposes his own such list, and although not exhaustive, he does provide eight examples which also account for social factors such as class and morality. For example, high class can be seen in "music of the hunt: associated with the outdoors, the good cheer and excitement of the chase, good health, upper-class amusement" while low class can be seen in "hurdy-gurdy music:

²⁵ Leonard G. Ratner, *Classic Music: Expression, Form, and Style* (New York: Schirmer Books, 1980): 9.

²⁶ Martin, 420.

associated with the lower classes, street entertainment.”²⁷ Though not referenced by Martin, the last song of Schubert’s *Winterreise* song cycle, “Der Leiermann” (“The Hurdy-Gurdy Man”) immediately springs to mind as an anomalous use of the hurdy-gurdy style. Far from lively entertainment, the song depicts the narrator’s encounter with a downtrodden street musician who is (perhaps) the personification of death. The two characters commiserate in the bitter cold, while the hurdy-gurdy scrapes on, endlessly into eternal night. The rich and sorrowful context in which Schubert places the hurdy-gurdy topic significantly transforms the emotional content of the reference (that is, entertainment), even altering it completely. Topical expression proves here to be quite malleable, while musical expression can be presumed to be independent from topic, or at the very least, not exclusively within its domain.

Martin goes on to raise the question of expressivity in performance as an oblique way of addressing expression in general. Given that an effective performer responds to the musical materials (melody, harmony, rhythm, topics etc.) during a conventional, prepared performance; what expressive sight-reading reveals is that performers are sensitive to musical materials which are removed, or at least distinct, from the works themselves. The case is made that such “pre-compositional material” (that is, the physical phenomena of sound itself) is naturally given to expression due to acoustic principles.²⁸ For example, the octave is an interval of stability due to the naturally-occurring harmonic series, and intervals near the octave will tend to resolve toward it, producing an innately expressive effect. For Martin, expression does not originate from topics, the mind, or even music—but in nature, or sound itself. Since the materials themselves are expressive, they imbue the whole musical activity with their expression; the composer simply

²⁷ Martin, 419.

²⁸ Martin, 421-422.

forms the piece from expressive materials, the performer reveals both the materials and the work itself, and the listener responds to the entire construct.

By locating expression in the sonic materials, and not in quotations or topics, Martin is free to redefine topics. Note that this does not preclude the possibility of expression in topics entirely, for in the arrangement proposed, expression can be manifested by topics without arising from them, since it emerges from sound itself. Metaphorically speaking, just as a river flowing through a valley originates in the mountains, so too does topical expression originate in sonic materials. Martin argues that this ultimately reveals connectedness as the true purpose of topics, stating,

I suggest that the real and important effect of the topics is to give to the work a feeling of being connected to other experiences of life: the court, the hunt, church-going, etc. This accounts for something very important in the experience of many listeners—the feeling that even very “abstract” music has close connections to the fullness of life’s experiences.²⁹

Just as conventional quotations are made to specific composers and their works, topics are essentially quotations made to anonymous composers—that is, entire genres. In both cases, references to other music serve to position the piece in question, while also engaging in an extramusical dialogue.

* * *

The above discussion has consisted of the semiotic and aesthetic transformations of topic theory, by Agawu and Martin, respectively. These sources have been presented prior to Ratner, the originator of topic theory, due to the manner in which they inform the present study, as well as highlighting aspects which are somewhat latent in Ratner’s original conception. That is, the extended sections on cognitive psychology and aesthetics which this study contains are in many

²⁹ Martin, 420.

ways sparked by the aforementioned sources. Furthermore, it is through their lens that a discussion on Ratner can be more directed and informed. Among the leading theorists of classical-era music in the twentieth century, Leonard G. Ratner is perhaps most renowned for developing and formalizing topic theory, as found in his landmark 1980 work, *Classic Music*.³⁰ A highly influential concept, topic theory has since intersected with many fields, so it is prudent then, to include Ratner's original definition here, in full:

Music in the early 18th century developed a thesaurus of *characteristic figures*, which formed a rich legacy for classic composers. Some of these figures were associated with various feelings and affections; others had a picturesque flavor. They are designated here as *topics*—subjects for musical discourse. Topics appear as fully worked-out pieces, i.e., *types*, or as figures and progressions within a piece, i.e., *styles*. The distinction between types and styles is flexible; minuets and marches represent complete types of composition, but they also furnish styles for other pieces.³¹

This definition alone raises a number of important points. First, that the conventional music of shared social settings was widespread, or at least familiar enough that composers expected audiences to recognize the references. Second, that the music which was referenced by topics was preestablished, and part of an assumed common-heritage. Third, that these references had the capacity to evoke both emotions and settings. And lastly, that their form could range from a simple, passing allusion all the way to a full-scale movement.

Taking a step further back, topics emerge as era-specific social constructs; the identification of which would have been innate for contemporary audiences. This naturally leads to questions of loss or altered meaning—for when topics go unrecognized by modern audiences (or any other society aside from the original setting) then their intended social meaning is also rendered absent. Even if modern audiences are equipped with the knowledge of classical-era topics, the particular and immediate salience enjoyed by historical audiences is simply not

³⁰ Leonard G. Ratner, *Classic Music: Expression, Form, and Style* (New York: Schirmer Books, 1980).

³¹ Ratner, 9.

replicable. For example, Mozart's operas contain innumerable references to social class (high-born vs. low-born, nobility vs. peasant etc.) which do not have exact analogs in modern life, and so must be conceptually translated—likely losing or altering their original meaning in the process. The trope is often repeated that Mozart made every single note integral to the whole, and that the removal of just one would be ruinous. But this emphasizes “wholeness” in terms of the musical score alone, and overlooks the fact that social meaning (such as those assigned to topics) resides in the audience, and not the score. Taking topics into account, it becomes clear that wholeness of the musical object is at least distributed across both the domains of music and society, a notion which challenges the tenets of Gestalt theory, or any other theory which upholds artistic objects as bounded, independent, and complete units.

As mentioned above, Ratner views topics as vehicles of *expression* (specifically, emotional expression), but it is interesting to note that he places all other musical elements (phrasing, harmony, rhythm, melody, texture, and performance) under a separate category, *rhetoric*.³² The distinction here is essentially between semantics and syntax, but these terms are neglected by Ratner, who instead uses expression/rhetoric, or meaning/structure, among many others. The looseness of Ratner's linguistic analogy is frustrating not only because it pervades the writing, but also because it is used to structure the entire theory—a point which Agawu criticizes at length.³³ But the connection between linguistic and musical rhetoric was a widespread (if unformalized) view in the classical era, and since Ratner's theories assume much the same form, they appeal to a historical basis despite any questionable objective truth. Additionally, the appeal to language may saturate Ratner's work, but it can be argued that the more critical theme is actually his anti-structuralist stance, as he repeatedly stresses the primacy

³² Ratner, 31.

³³ Agawu, 7.

of surface features over underlying structures. This applies not only to topics, but even to those features more prone to macro or structuralist analysis, such as harmony. By emphasizing moment-to-moment expressivity and meaning, as opposed to large-scale structural principles, Ratner fundamentally sets his theory apart from the bulk of musical analysis, with its frequently formalist or structuralist biases.

Topics, owing to their exclusive position within the expression category, are in some sense privileged by Ratner over the other features, since expression was a primary concern within the classical era. Widely believed by contemporary writers to be the ultimate goal of music—the stirring of passions, affections, or feelings naturally attracted a host of theories which attempted to connect specific musical elements with their expressive qualities. Perhaps the most famous of these theories is the Baroque *doctrine of affections* which holds that affects can be accurately represented in the arts.³⁴ But as argued by Rita Steblin (whose work is discussed at length in the Tonal Planning section), the assumed preeminence of the theory is undermined by the fact that it was preceded by countless other theories, and that it never amounted to a formalized consensus.³⁵ The doctrine of affections ultimately functioned as a loose, yet highly pervasive precedent for classical composers to draw upon; Ratner therefore remains carefully removed from its specifics, instead emphasizing the cumulative importance of musical expression as a dominating concern in the minds of composer, audience, and critic alike.

³⁴ Ratner, 3-4.

³⁵ Rita Steblin, “Key Characteristics in the Eighteenth and Early Nineteenth Centuries: A Historical Approach” (PhD diss., The University of Illinois at Urbana-Champaign, 1981): 21.

Figure 2.2. Complete list of topics as found in *Classic Music* by Leonard Ratner³⁶

❖ Secular Music: (also referred to as free, or galant, style)

- Dances
- March
- Military and hunt music
- Singing style
- Brilliant style
- French overture
- Pastorale and musette
- Turkish music
- Sturm und Drang (storm and stress)
- Empfindsamkeit (sentimental style, or sensibility)
- Fantasia
- Pictorialism
- Word-painting

❖ Church Music: (also referred to as strict style)

- Alla breve (stile legato “bound style”)
- Learned style (contrapuntal: imitation, fugue, canon etc.)

There are a number of interesting points to make in regards to Ratner’s list, but foremost among them is the inclusion of pictorialism and word-painting. While later writers add more topics (Agawu brings the total to 27 and Martin introduces musical quotations) they tend to omit pictorialism, or word-painting altogether. Even Ratner seems to have difficulty here, placing them a bit awkwardly under a separate heading, and only at the end of the topics chapter. He goes on to distinguish between pictorialism and word-painting based on their manner of reference; while pictorialism is used to convey “some idea of an action or scene,” word-painting imitates poetry or literature, by “the matching of a word or phrase in a text to a musical figure.”³⁷ In this definition, pictorialism imitates an event while word-painting imitates language.

³⁶ Ratner, 9-27.

³⁷ Ratner, 25.

In light of Martin's case for topics as a subcategory of musical quotations (that is, they are quotations of genre, not of specific works) there appears an easy route to including pictorialism and word-painting here as well. Specifically, a higher, or more general, category can be introduced consisting of all extramusical references, which are essentially synonymous with extramusical semiotic signs. It is precisely for this reason that Agawu's semiotic approach to topics is so attractive—namely, that the fundamental concept linking topics, pictorialism/word-painting, and quotation is that they all refer to something other than their own sonic manifestation; in other words, they are all signs.

Dances: Rhythm as Topic

The overwhelming preponderance of dance types in the eighteenth century simply cannot be overstated. The people clearly liked to dance. Social dance forms transformed throughout the century, spawning numerous variations in an endless pursuit to charm the volatile demands of popular taste. For instance, the minuet—among the most popular dances—could be categorized as a passepied if sufficiently lively, or a sarabande if sufficiently slow. Note that the operative word here is “sufficiently”—as it is indicative of the rather vague naming conventions which were inconsistent, subjective, regionalized, and popularly-minded. Each dance was also typically associated with certain characteristics or emotions, but many pieces intentionally defied genre norms. As such, producing a detailed taxonomy of all the various dance forms would somewhat misrepresent the nebulous reality of overlapping definitions. Ratner's solution sidesteps this issue by proposing two factors of classification: to categorize the dances themselves based upon social class, and to categorize their manner of incorporation into larger, classic music forms

based upon degree of inclusion. A series of examples are provided below in order to illustrate Ratner's proposed two-factor structure.³⁸

Figure 2.3. Ratner's organization of dance topics

Factor 1 – Dances based upon social class:

- ❖ High Style – generally elegant and courtly
 - Minuet
 - Gavotte
 - Polonaise
- ❖ Middle Style – generally pleasant and lively
 - Bourrée
 - Gigue
- ❖ Low Style – generally rustic and buoyant
 - Contredanse
 - Ländler

Factor 2 – Dances based upon manner of incorporation into classical music:

- ❖ Social – literal representation
 - Conforms to norms of choreography, melody, form etc.
 - Intended for the dancer's enjoyment
- ❖ Theatrical – expanded representation
 - Conforms to norms freely—from literal to extended and open
 - Intended for the audience's enjoyment of the dance (e.g., ballet)
- ❖ Speculative – topical representation
 - Conforms to dance rhythms alone, uses the dance as a topic of discourse
 - Not intended for dancing, but to reference the dance

Essentially, the first factor involves *what* social setting is being referenced, while the second factor involves *how* the reference is being made; together, they form the dance topic.

Ratner remarks on the pervasiveness of the dance, stating “dance topics saturate the concert and theater music of the classic style; there is hardly a work in this era that does not borrow heavily from the dance.”³⁹ Especially by “speculative representation” (inserting the rhythms of dance

³⁸ Ratner, 9-18.

³⁹ Ratner, 18.

alone, as opposed to a complete recreation) classical-era composers simply alluded to the dance topic, and thereby made an easy synthesis of dance and non-dance music.

If one steps back to regard Ratner's theory as a whole, topics appear generally as a type of referential meaning familiar to a historical audience. While extramusical in meaning, topics are manifested by intramusical features which would otherwise remain concealed in a solely intramusical analysis. This suggests not only that one analytic approach can potentially impact the others, but that a multivalent approach is essential to apprehending a fuller view of musical meaning. To reiterate a prior point, topic theory through Agawu and Martin suggests considerations of aesthetics and psychology which the present study expounds upon; but in the same way, Ratner suggests considerations of musicology which must also be addressed. And it is to these musicological and social considerations that the following section will attend, especially with regard to their ramifications in music theory.

Background

A Biographical Justification for Multivalence

Mozart's September 26, 1781 letter to his father,⁴⁰ while specifically concerning progress on *The Abduction from the Seraglio*, is significant with regards to both musical aesthetics and extramusical considerations. In terms of aesthetics, this is due to Mozart's revealing perspective on the wrath exhibited by the character Osmin, and how intense emotion must be depicted:

For as a man in such a violent fit of passion transgresses all the bounds of order and propriety, and forgets himself in his fury, the same must be the case with the music too...the passions, whether violent or not, must never be expressed so as to become revolting, and the music even in the most appalling situations never offend the ear, but continue to please and be melodious.⁴¹

The implication that a transgression of order and propriety can also remain pleasing and inoffensive is certainly questionable today, but Mozart's natural assumption of this fact can be seen as more broadly indicative of his historical context. Often viewed in relation to late Enlightenment thought, Mozart here valorizes beauty, establishing it as a paramount artistic concern with regards to musical expression. Aesthetics aside, the less-discussed portions of this letter are highly relevant to the present study, as they demonstrate Mozart's preoccupation with extramusical factors; specifically, performer abilities, listener expectations, text, and plot.

Mozart describes how the role of Osmin was specifically expanded for the singer involved "who certainly has a grand bass voice...so we must take advantage of this, especially as he has the whole public in his favor here." But this is by no means an isolated instance of Mozart showcasing performer abilities; he goes on to say that Belmonte's aria in *A major* is "written

⁴⁰ W.A. Mozart, *The Letters of Wolfgang Amadeus Mozart: 1769-1791*, trans. Lady Grace Wallace, vol. 2 (New York: Hurd and Houghton, 1866) 81-84.

⁴¹ Mozart, *The Letters*, 2:82.

expressly to suit Adamberger's voice" while Constanze's aria had to be "sacrificed...to the flexible throat of Madlle. Cavalieri." With regards to listener expectation, Mozart seems equally concerned: the aforementioned rage of Osmin is "made comical" by accompaniment in the so-called Turkish style—a common topic recognizable to many listeners; the opera's Janissary chorus is "written entirely to please the Viennese"; while the trio of the first act finale

must go very quick, and wind up noisily at the close, which is always appropriate at the conclusion of an act; the more noise the better, the shorter the better, so that the people may not have time to cool in their applause...It is modulated through different keys, and I think no one can well go to sleep over it.⁴²

It is clear from the above examples that Mozart gave intense consideration to the performance aspects of his music—that is, the performers, audience, and venue—allowing it to influence the compositional process, and produce a work designed for popular reception. In terms of text, Mozart is again, quite specific: sometimes he writes music prior to informing the librettist of "the words that I require"; while other times he writes in response to the text "as the words admitted of it, I wrote it very passably for the three voices"; and yet on other occasions he even edits the source text with little regard for German poets, who "do not understand the theatre...their personages talk as if addressing a herd of swine." Finally, Mozart divulges his plans for sweeping changes to the plot which have not yet been communicated to the librettist:

but I cannot go on with it just now, as the whole story is being altered, and by my own desire. At the beginning of the third act there is a charming quintet, or rather finale, but I should prefer having it at the end of the second act. In order to make this practicable, great changes must be made, and in fact an entirely new plot introduced; but [the librettist] is already over head and ears in other work.⁴³

Mozart's letter thus reveals a composer juggling the near-infinite demands of performer ability, listener expectation, text, and plot; not to mention a chaotic working process with a

⁴² Mozart, *The Letters*, 2:83.

⁴³ Mozart, *The Letters*, 2:84.

serious lack of communication. Though the degree to which the information can be trusted is somewhat uncertain—given Mozart’s inclination for epistolary deception with his father⁴⁴—it does at least suggest that Mozart was concerned with many extramusical factors aside from the notes themselves. In fact, less than a month later on October 13, 1781, Mozart again writes to his father, giving further consideration to what constitutes a good libretto.⁴⁵ In this letter can be found Mozart’s oft-quoted and somewhat infamous declaration, “in an opera the poetry must necessarily be the obedient daughter of the music.”⁴⁶

Taken by itself, the above quote may be used to support the belief, at least as far as Mozart’s operas, that music presides over all other features; and therefore, that score analysis and intra-musical considerations are rightly preeminent over extra-musical considerations, with features like plot, text, and social context being subservient. However, this argument misconstrues the bulk of Mozart’s letter, which is more so about stylistic norms, the difficulty of collaboration, and the proper coordination of text and music. Mozart first admits that some verses for the character Osmin are “not the best” when considered alone, but are so well-suited to the music, that in performance “no deficiencies will be found.” Mozart then goes on to argue that an opera buffa can succeed “when the plot is well worked out, the verse written expressly for the music, and not merely to suit some miserable rhyme.” This raises a number of interesting points which all complicate the preeminence of music, and will be discussed below.

Mozart first lists plot individually, and only afterward discusses verse in relation to music. This implies a conceptual separation between plot and text such that Mozart treats them independently—the verse must serve the music, but the plot must stand on its own. There is also

⁴⁴ For more on epistolary deception, see the discussion elsewhere in this work on Craig Harwood’s dissertation, “Subversive Strategies: Conventions and Manipulation of Gesture and Syntax in Mozart.”

⁴⁵ Mozart, *The Letters*, 2:86-88.

⁴⁶ Mozart, *The Letters*, 2:87.

a sense that just as the music precedes the text, the plot arguably precedes the music. While Mozart acknowledges the significance of verse in general, it is particularly in rhyming that he takes issue. Throughout the letter, the point is made that the persistent rules governing poetry and rhyming have deleterious effects in combination with music. Mozart even goes on to draw a parallel with his own field, stating “if we musical composers were to adhere as faithfully to our rules, (which were very good at a time when no one knew any better,) we should compose music as worthless as their libretti.”⁴⁷ Mozart is not only arguing against any innate value in rules, he is making claims of aesthetic worth which are based on artistic agency.

Far from diminishing the importance of text, Mozart concludes by describing an ideal collaboration in which the composer understands the stage, and the librettist is liberated from convention, thereby becoming “that true Phoenix—an intellectual poet.” Whatever the reality may be, these do not appear to be the sentiments of a music-first or music-only mentality which this letter is commonly used to justify. And again, the point needs to be reiterated that the true beliefs of Mozart, and the degree to which they manifest in his works, cannot be assumed equivalent to the contents of his letters. The two letters discussed may be wishful thinking, deceptive, or serve any number of other functions; but they do at least demonstrate Mozart’s *awareness* of extra-musical factors, and his claimed belief in their significance. Furthermore, he argues against an innate value of rules, and appears to be passionate about artistic agency in creation. Analytic approaches to Mozart’s music have long tended to be intra-musical, rule-based, and formalist, but Mozart’s claimed stance appears to be multivalent and flexible. While Mozart’s claims cannot be used to justify one method over another, they do at least lend

⁴⁷ Mozart, *The Letters*, 2:88.

credibility to the multivalent approach of the present study, which seeks to approach opera through various methods and domains, such as music, plot, text, and social context.

A Brief Defense of Dated Thought

Charles Rosen approached classical-era studies in a highly interdisciplinary manner which launched his 1972 book, *The Classical Style* to an immediate and enduring pedestal.⁴⁸ Enjoying critical and popular success is a testament to Rosen's innovative approach, which involves a combination of music theory, musicology, and aesthetics—but the work is, naturally, not without fault. Rosen is keen to combine notions of linguistics with that of music, but a clear use of definitions is somewhat lacking. The manner in which musical language is used by a particular style to express meaning is perhaps the core concept of Rosen's *The Classical Style* but it is frustratingly defined in nebulous terms. For instance, style is defined as “a mode of understanding,” and also as a way of using a language (such as how Mozart's personal style relates to the classical style in general) but a style may even become “a dialect or language in its own right.”⁴⁹ This latter definition is particularly troublesome in that it implies some equivalence or overlap between language and style—as opposed to materials of language being dictated by style—and creates a conflicting relationship left unaddressed by the text.

Rosen's love for systematic thought is another factor which can at times obscure what would otherwise be clear and simple observations. For example, the three elements above—language, style, and expression—when removed from Rosen's abstract hierarchy of causality, become truly straightforward concepts. Specifically, the musical language in question is functional tonality, the style which utilizes that language is the classical style, and finally, the

⁴⁸ Charles Rosen, *The Classical Style: Haydn, Mozart, Beethoven* (New York: W.W. Norton, 1972).

⁴⁹ Rosen, 19-20.

expression of the music is meaning itself, whether emotional, intellectual, or otherwise. In this manner of thought, it becomes clear that Rosen is crediting Haydn, Mozart, and Beethoven for not only grasping the potential of functional tonality, but fully realizing it through their formulation of the classical style.⁵⁰ Thus, the “masterworks” of the Vienna school which unify musical elements like melody, harmony, and rhythm are but single members of the larger masterwork, which is the classical style itself: a coherent and unified system of language and style, one which epitomizes functional tonality.

Rosen’s methodology throughout the text appeals to the same principles of “coherence, power, and richness of allusion” which occupy his own artistic judgements.⁵¹ Arguments are frequently formalist (great art exhibits coherent form and logic); and to a lesser degree, instrumentalist (great art communicates a message), and emotionalist (great art evokes emotion). But it is worthy to note that the questionable basis of Rosen’s claims may not be as problematic as laid out here, for the biases present in *The Classical Style* are (arguably) consistent with the era itself. Any analysis which is compatible with its material may not necessarily need to appeal to a broader, ground truth—as it is instead justified by the goodness of its fit. Perhaps for this reason, Rosen continues to occupy a high stature within classical-era scholarship, and it is worthwhile to present those concepts which have proven most influential here, as they pertain to the present study.

The implicit goal of Rosen’s work is to reveal the greatness of the classical style by demonstrating the profound coherence of all its parts. To say the least, this is now a dated and doubted approach which has little modern currency, but to disregard Rosen entirely would be to miss a remarkably astute and insightful work. It is a richly-detailed account, often showing how

⁵⁰ Rosen, 22-23.

⁵¹ Rosen, 21.

conceptual transmissibility, or the way concepts travel between different contexts and people, greatly shaped the classical style. Advances in stage music are as likely to transmit across sub-genres such as tragic and comic opera, as they are to infiltrate concert forms such as the sonata, concerto, and symphony. Likewise, the works of Haydn, Mozart, and Beethoven are shown to be deeply interrelated, and best understood as a dialogue of exchange. Mozart in particular is presented as a master of such synthesis, and Rosen appears to regard it as a central concept in the composer's work. This should not be altogether surprising, as Enlightenment ideals sought symmetry, reason, and beauty in art—and that Mozart would seek to unify disparate musical traditions into one universal, classical art form is similarly not an outlandish proposition.

It is thus with a critical eye and an open mind that the work of Rosen will be engaged. While more recent contributions by Mary Hunter (among many others) provide an updated and more critical lens of classical music—and in many cases are more informative for the present study—the work of Rosen provides an historical insight which is emblematic of older thought. The forward nature of time cannot be mistaken for progression, as the yawn of eons equally produces decay and rot; but occasionally, there yet remains a dim, argent gleam beneath the patina of centuries, and it is to this the eye must be attendant.

Considerations of Music Theory

The present section interweaves a variety of sources to roughly emulate discourse between music theory and musicology, while also providing a strong contextual background for the rest of the study. Of the sources utilized, three prompt the bulk of discussion: Charles Rosen's *The Classical Style*, Leonard Ratner's *Classic Music*, and Mary Hunter's *Mozart's Operas*. Where Rosen is more formalist and intramusical, Ratner tends to be more perceptual and

extramusical; but both write primarily from the lens of music theory, and are informed to a lesser degree by musicology and aesthetics. Hunter's work, aside from being decades more recent than the other two, is (relatively speaking) far more focused, since it is musicological but not intramusical in scope. Furthermore, when musicological studies are held against theoretical ones, there is revealed a startling pattern in which music theorists use vastly simplified—and even wholly inaccurate—views on musicology to support their stances. It is interesting to note how concepts out of favor in one field still hold relevance in another; but in light of the previous defense of “dated thought,” this discrepancy will not be assumed as a fault. However, the observation will be too often made that with even basic discussion between fields a mutual advancement could easily be facilitated—for although *dated* implies a lack of popularity, it is fundamentally different than *unfounded*. Particularly with regard to operatic studies, Hunter's work will be used to strongly inform the discussion and potentially refute what might appear to be a consensus among the theorists.

Periodicity

The prominence of the musical period came to a zenith in the classical era, and in some sense, it is the distinguishing factor between eras which also share functional tonality in common. That is, neither the Baroque nor Romantic eras are nearly as periodic as the classical era; but when analyzed with structuralist approaches, like Schenkerian analysis, the periodic surface of classical music cannot readily be accounted for, and so goes unremarked in much analysis. Ratner's surface-based approach particularly lends itself to periodicity, and even discusses it before any other musical feature, welcoming it as a core tenet of classical rhetoric.⁵²

⁵² Ratner, 33.

Defining a period can be done in a rather concrete fashion: a group of phrases arranged in progressively stronger cadences, the last of which produces finality and closure. Most often, periods occur as a question-answer pair of phrases (referred to as the antecedent and consequent), which together generate symmetry and recurrence due to shared characteristics. In another sense, periods depart from a beginning, continue through a middle section, and then arrive at a clear and articulated end, punctuated by a conclusive cadence. Ratner thus defines periods through two traits—symmetry and cadence—before pointing to their linguistic lineage, stating “a period in language is a *complete* statement, a sentence whose sense is fully grasped only when it has come to a close...in music, a passage is not sensed as being a period until some sort of conclusive cadence is reached.”⁵³

As basic units, periods can be concatenated together into successively larger structures, eventually forming large-scale forms. The various characteristics of periods at small-scale (symmetry, repetition, articulation etc.) are thereby transferred from the lowest to highest levels of structure, suffusing the whole—an aspect referred to as *periodicity*. For example, just as a model constructed of Lego bricks retains the characteristics of an individual brick, while also resembling the object being modelled; classical forms like the sonata or rondo can be constructed from musical periods, which lend their periodic qualities to the whole. For Ratner, the period’s true importance lies in its abstract manifestation, periodicity, which not only reflects overall hierarchical organization, but connects to musical rhetoric itself. To reiterate Ratner’s argument, it is that music has two halves—expression and rhetoric—and while expression is handled mostly by topics, rhetoric is handled by all other musical features, such as periodicity, melody,

⁵³ Ratner, 33.

and harmony. Furthermore, periodicity is the primary feature of rhetoric, and by connecting all musical features to periodicity, a cohesive system of rhetoric is necessarily satisfied.

Rosen similarly supports periodicity as a critical delineation between the Baroque and classical styles, but further connects it to emotional expression, stating simply that “dramatic sentiment was replaced by dramatic action.”⁵⁴ The seamless flow of Baroque music, like a perpetual motion machine, is well-suited to relatively static emotional states, while the articulated events and periodic phrasing of classical music are more appropriate for highly volatile, dynamic emotional states. This is not to say that classical expression is an advancement over the Baroque, but that the two styles have to rely on very different methods to depict contrasting moods. Where Bach is more likely to juxtapose contrasting blocks of music, Mozart is more likely to create contrast at a local level, such as within a single melodic phrase or by a gradually changing texture. Rosen even goes on to cast periodic phrasing as the key “disruptive element” leading to the ultimate downfall of the Baroque and its texture of continuity.⁵⁵

If periods are built from just two components, symmetry and cadence, as Ratner claims, then it should do well to define them here. But while a cadence is a generally straightforward entity (a harmonic progression which culminates in arrival, or closure) symmetry is a rather open and undefined concept in the auditory realm. Visual symmetry more clearly implies repetition across an axis, and the overall balance of proportions which results from it. But in writings on musical symmetry, a host of terms (repetition, recurrence, pairing, balance, proportion, periodicity, and so on) exist with ambiguous interchangeability. This is probably evidence of the fact that musical features can be understood to exhibit symmetry in different ways; for example,

⁵⁴ Rosen, 43.

⁵⁵ Rosen, 57.

the contour of a melodic arch is visually symmetric about the center, while the ternary, or ABA harmonic plan is conceptually symmetric due to recurrence.

Despite the vagueness surrounding symmetry, writers have not been deterred from frequently citing it as a crucial aspect of the classical style; and Ratner is no exception, joining Rosen, Tovey, and nearly every other writer studying the classical style. But where Rosen's symmetry is a result of an uncertain number of content and duration factors (phrasing, contour, harmony, proportion etc.), Ratner reduces symmetry down to essentially one word: pairing. Defining symmetry as dependent on, or even synonymous with pairing, Ratner declares "symmetry appears in classic music on every level of structure, from paired motives, phrases, periods, to larger sections of a movement."⁵⁶ Indeed, to call something symmetric is to necessitate the repetition of internal units, displaced in opposition, and resulting in balanced proportions. For the purposes of this paper, all these terms will thus be understood as coexisting—not synonymous—since they are all oriented to different facets of symmetry.

The increased importance of symmetry in the classical era also explains why irregular or extended phrase lengths grew into a more powerful device, as they audibly disrupted the clear periodic expectations generated by the style.⁵⁷ In contrast, the more continuous textures of the adjacent Baroque and Romantic eras did not suggest such a strong and exact macro-rhythm as that borne from periodic phrasing, and so deviations to phrase length lacked the same perceptual, functional, and dramatic potential.

⁵⁶ Ratner, 36.

⁵⁷ Ratner, 40.

Rhythm

At a more basic or general level than periods, rhythm is the temporal organization of music. A series of undifferentiated beats creates a pulse alone, but by emphasizing some beats more than others, larger groupings can be made, and these groups can then lead to the perception of meter. Though much rhythmic analysis is limited to more local levels, Ratner sees rhythm as a more abstract organizational principle active across all levels of structure.⁵⁸ Groups of beats, measures, and phrases can all exhibit strong-weak relationships, and thus create higher levels of rhythm, sometimes referred to as hypermeter. This is of course dependent upon the perception of defined units, the subsequent identification of similar, or corresponding units, and the differentiation in strength between said units. In short, a process of unit identification and differentiation must occur for groups to emerge.

At the lowest level of Ratner's rhythmic system, beats can be grouped by examining the accent, duration, and prominence of individual notes, such that the line suggests certain strong beats (potentially irrespective of) the notated meter. For example, when considering a line individually, notes which are longer, louder, or marked off in some other way (such as through articulation, pitch, timbre etc.) receive emphasis, or strong beats. At the next higher level, measures can be grouped according to phrasing. This is determined by conventional principles like contour and harmony which produce, for example, four-measure phrases. Ratner unexpectedly deviates at the highest level from grouping phrases into periods, instead opting to group phrases together into more-general "phrase groups" based upon relative emphasis—denoted alternately as heavy or light. Considering the centrality of periodicity to Ratner's theories, the omission of actual periods in the discussion on rhythm is somewhat curious.⁵⁹ Since

⁵⁸ Ratner, 68.

⁵⁹ Ratner, 74-80.

the period is clearly articulated—with a beginning, middle, and end which together form a single unit—then a series of periods could quite easily be conceived to produce a macro-rhythm. Additionally, the interaction between the three levels of grouping is not discussed, nor is a comprehensive set of principles used to determine what constitutes emphasis, and the whole system is thus lent an air of vague subjectivity.

It should briefly be noted that Ratner's conception of rhythm, which is based around unit formation and strong-weak relationships, is connected to two, broader concepts not noted in the text. First, the psychological perception theory known as Gestalt theory describes how units are formed from smaller elements. Gestalt theory has been applied to countless music perception studies, and is discussed at great length in the psychology portion of the present study, and so will not be detailed here. The other aspect of rhythm discussed by Ratner, strong-weak relationships, can more recently be seen in Balazs Rozsa's dissertation on classical form.⁶⁰ Rozsa adapts Hugo Riemann's fundamental unit, the *Motiv*, to be an abstract strong-weak unit present in every level of musical organization.⁶¹ Concatenating from local to macro levels, the *Motiv* exists *a priori* like an impulse of energy, carrying associations such as tension-relaxation, or inhale-exhale. Though unabashedly (and unsurprisingly) formalist in nature, Rozsa's work unifies highly-specific concepts like meter and hypermeter by emphasizing their common heritage to the abstract *Motiv*; thereby drawing attention to the interrelatedness of classical music, and the more general question of whether form is unavoidable in art.

Returning to Ratner, there is a critical takeaway somewhat buried by the broader discussion, and that is the supreme importance of *regularity*. Expectation is nurtured by a pattern of regular groupings, but with irregular groupings, the pattern is disrupted (or rhythmically

⁶⁰ Balazs Rozsa, "The Formal World of Viennese Classicism" (DMA diss., University of Washington, 2006).

⁶¹ Rozsa, 14, 81.

unresolved). Deviation from the pattern necessitates further material to return, and raises the energy level above that of periodic phrasing. By altering rhythmic groups, classical composers could thus create “large-scale rhythmic action” persisting beyond the periodic cadence.⁶² Ratner essentially makes the case that *unresolved* rhythmic patterns work against the *resolved* harmonic pattern of the cadence, propelling the music forward and making possible large-scale forms based on periodicity.⁶³ In short, the classical style uses rhythmic tension above the cadential level to necessitate further material, or continuation. Deviations at higher levels to the regular or expected macro-rhythm are in some sense an analogous source of energy as that generated by syncopation at the local level; this might be termed “macro-syncopation”—or irregular hypermeter.

In an unusual reversal of roles, Rosen considers rhythm more fluidly than Ratner, and in relation to various other concepts, whilst resisting the urge to systematize rhythm alone. Rosen’s discussion of rhythm is thus in many respects less burdened, more insightful, and far less formalized than Ratner’s system, and will be discussed presently. Rosen’s argument begins similarly with regard to periodicity, which is to say that by way of clear phrasing, classical music produces a discernible pulse at the phrase level, above that of the conventional, local level. Phrasing which is furthermore *regular* in length generates a consistent phrase-level pulse which subsequently orders (or organizes) higher levels of structure. This propagation is facilitated by the hierarchical structuring of classical music, where phrases are concatenated into periods, and so forth. Classical-era composers were quite aware of this possibility, and Rosen points to their “heightened, indeed overwhelming, sensitivity to symmetry” which thereby elevated the

⁶² Ratner, 74.

⁶³ Ratner, 80.

importance of higher-level rhythm by allowing it to dictate the pacing of musical events.⁶⁴ This is a predictable turn for Enlightenment thinkers, as applying a logical framework to macro-level rhythm would be an attractive means to create order (that is, beauty) through harmonious and symmetric proportions. But aside from connecting periodicity to Enlightenment thought, Rosen argues that it also liberates two features—texture and dynamic:

The articulated phrase required its individual elements to be discrete and set off from each other in order that its shape and symmetry might be clearly audible, and this in turn brought about a greater variety of rhythmic texture and a much larger range of dynamic accent.⁶⁵

By gradually varying texture and dynamic, as well as exhibiting a greater overall range thereof, not only could individual phrases be clearly marked, but higher-level transitions expressed. In this sense, the crescendo is analogous to the gradual change of pulse, or rhythmic transition, which became prevalent in the classical era.⁶⁶ The rhythmic transition is often executed by introducing faster rhythms in the accompaniment, and only later in the main voices, producing a smooth change of pulse. Moreover, this is often coordinated with harmonic tension, such that a more dissonant chord introduces faster rhythms. To abridge Rosen's argument up to this point, it is that the clear periodicity of classical music imparts the following: a hierarchical structure, an increased importance on proportions or pacing, an expanded role for texture and dynamics, and a correspondence with dissonance. Where Ratner places rhythm and harmony in opposition—unresolved rhythmic patterns against resolved cadences—Rosen places rhythm in a veritable sea of connections all intersecting with periodicity. In this way, Rosen connects each musical feature to periodicity more persuasively than Ratner, and so prefigures Ratner's argument for musical rhetoric, yet nearly a decade prior.

⁶⁴ Rosen, 58.

⁶⁵ Rosen, 64.

⁶⁶ Rosen, 65.

To the above list, one more feature will be added—sequence—or, the restatement of material at a different pitch level. Both dissonance and sequence generate musical energy by compelling music forward; specifically, dissonance requires resolution and sequence suggests continuation.⁶⁷ But both can only be sustained at the local level for a limited time before seriously disrupting tonality and periodic phrasing, a consequence which would later be exploited by Wagner and the late Romantics. However, the classical era did have another solution to long-range musical energy and dissonance not available to the Romantics. With clear functional tonality, entire key regions could be defined and ostensibly felt as dissonant relative to the work's tonic, pressing the music to continue via unambiguous key relationships. Rosen sees this as the natural evolution of dissonance in the Western tradition: from dissonant intervals in counterpoint, to dissonant chords in harmony, and finally to dissonant keys in structure.

Harmony

Ratner identifies two different approaches to tonality; referring to them as the “solar” and “polar” arrangements favored by the Baroque and classical eras, respectively.⁶⁸ The solar arrangement places the tonic at its center and all related keys (II, III, IV, V, and VI) in a ring around it, much like a constellation, or solar system. The hierarchy here is simple, with the tonic ruling while the related keys all occupy the same subordinate level. This promotes (or explains) the episodic approach to key changes common to Baroque fugues and concertos, where the home key frequently returns amongst sojourns to related keys. In contrast, the polar arrangement raises the dominant above the other related keys, and emphasizes the tension it creates in opposition to the tonic. The effect is a dramatization of key relationships perfectly suited to classical forms,

⁶⁷ Rosen, 120.

⁶⁸ Ratner, 51.

and it thus became the favored model in all cases except when imitating the Baroque (learned style, fugue, and so forth). Ratner goes on to attribute the development of periodicity and the classical style to the polar approach, stating “as harmonic layouts shifted from the discursive solar arrangement to the dramatic polar, the rate of chord change began to slow, and progressions began to show greater symmetry, with stronger focus upon the harmonic goal at the end of the period.”⁶⁹

Critically, the dramatic potential of the polar arrangement was made possible, or at least heightened, by the classical era’s clarity of key. For although the capacity of the tritone (as found between $\hat{4}$ and $\hat{7}$) to create cadences had been a long-standing feature in Western music, the newfound lucidity and importance given to the definition of keys was wholly unsurpassed, and produced a corresponding emphasis of both the cadence and macro-level harmonic relationships.⁷⁰ To Ratner, the dramatization of harmony which arises from the polar arrangement—in conjunction with key clarity—produces periodicity in both phrasing and form, and ultimately imbues the structure with expressive meaning. In his own words, “the definition of key is a structural event of the first magnitude in classic music, a satisfying and often triumphant reinforcement of periodicity on every level of structure.”⁷¹ Again, this amounts to an effort on Ratner’s part to unite all musical features under the single banner of rhetoric, by proving their involvement with periodicity in particular.

Rosen’s conception of harmony is much the same as Ratner’s, but he gives greater attention to directionality around the circle of fifths. Rosen begins his consideration of harmony by describing how the subdominant (or flat) direction weakens the tonic and lowers tension

⁶⁹ Ratner, 51.

⁷⁰ Ratner, 53.

⁷¹ Ratner, 48.

while the dominant (or sharp) direction destabilizes the tonic and raises tension.⁷² Successive modulation in either direction produces the circle of fifths, which—in order to be fully realized—necessitates the use of equal temperament tuning, so that enharmonic pitches are rendered equivalent. The circle of fifths is symmetrical in the sense that it arranges keys in an equidistant, circular fashion, but it is also asymmetrical due to the dominant direction outweighing the subdominant. This brings to mind the impossible staircases (or *Penrose stairs*) famously found in the works of artist M.C. Escher.

Scalar, step-wise motion is modal in nature and reinforces the tonic *pitch*, whereas functional harmonic motion, as arising in the Baroque, is tonal and reinforces the tonic *triad*—thus creating a conflict which Rosen refers to as “an ever-present tension within tonality between scale and triad.”⁷³ Later, as composers in the eighteenth century (particularly in the latter half, or classical era) began to view the dominant direction as outweighing the subdominant, and were simultaneously liberated by equal temperament, they reordered all harmonic movement to reflect the dominant’s superiority.⁷⁴ This perspective affected harmony at every level of structure, from chord progressions and cadences to modulations and macro-level form. In light of the dominant direction’s preeminence, triads were arranged hierarchically, and their respective tonalities were consequently lent the same relationship to the tonic.

While chromatic modulations in the Baroque were previously a coloristic, kaleidoscopic effect without regard for the flat or sharp directions, modulations could now assume a dramatic and specific relation to the tonic tonality. In the hands of the Vienna school, extended passages outside the tonic now created a defined dissonance at a structural level above that of the

⁷² Rosen, 24-25.

⁷³ Rosen, 25.

⁷⁴ Rosen, 26-27.

immediate progression, and allowed for large-scale harmonic logic to persist despite frequent cadences at the local level. Thus, an entire passage in a remote key would be considered “dissonant” to the tonic tonality, and any true closure would have to occur in the tonic. This provided a reason for the music to continue despite frequent cadences. The periodic phrasing which became a defining trait to the era—and the greatly intensified tonic-dominant axis which resulted from the dominant cadence replacing the weaker, plagal cadence—is ultimately counteracted by the newfound macro-level harmony made possible by the hierarchy of functional tonality.

Melody

Melody is a prominent line of tones which is often distinguished from harmony (simultaneous tones) and rhythm (timing of events); but the reality is not nearly so discrete, as melody necessarily suggests both harmony and rhythm. Additionally, melodic phrasing can create periodicity, or else serve to define formal boundaries, creating coherence on higher, macro levels. But aside from an organizational/structural tool of rhetoric, melody is often perceived as emotionally expressive or even referential to melodic topics, such as those associated with folk dances. The result is that melody overlaps nearly all musical facets, and presents a serious resistance to comprehensive analysis. Especially in classical music, melody is almost omnipresent thanks to the high regard it was given by writers and composers of the time. Ratner points out that the unfinished sketches of classical composers reveal a preference for beginning with melodic ideas, and that the bulk of historical music theory heavily focused on matters of melody.⁷⁵ Due to the pervasiveness and favorable historical opinion afforded to melody—paired

⁷⁵ Ratner, 81.

also with its nature to overlap other musical facets—the analysis of classical melody is both a fraught and critical affair. Ratner’s solution is unconvincing at times, but aspects of his analysis are quite illuminating and useful to the present study, and will be discussed below.

Ratner distinguishes between two basic types of classical melody: simple and figured.⁷⁶ While simple melody is bound by strict rules, such as Fux’s species counterpoint, figured melody freely overlays that basic structure with archetypal figures drawn from manuals and lexicons of the time. Simple melody is thus ubiquitous; either existing unadorned in the strict styles (such as *alla breve*) or as an underlying framework of structural tones amidst the elaborations of figured melody found in the free, or galant styles. In this way, the degree of ornamentation, or figuration, is employed variably according to style, but the underlying structure nevertheless remains generally obedient to the tenets of simple melody.

In using a simple melody to structure a figured one, classical composers could draw from the familiar methods learned in the long tradition of building upon a *cantus firmus* (which was often a precomposed medieval piece), to structure a new composition.⁷⁷ Specifically, these methods break a melody into short melodic figures which can be repeated and varied at will; thereby allowing short melodies to expand greatly, and even become a full movement. Manuals of composition in the classical era describe, for instance, how to expand an eight-measure dance melody into a 32-measure piece by means of the repetition and variation/transposition of melodic figures.⁷⁸ Although Ratner attempts—just as writers did in the eighteenth century—to connect the ordering of melodic figures to rhetorical devices from speech (such as *exordium*, *narration*, *antithesis* etc.) the exact relationship between specifically musical and specifically linguistic

⁷⁶ Ratner, 83.

⁷⁷ Ratner, 91-97.

⁷⁸ Ratner, 95.

terms remains both vague and dubious. Within Ratner's larger scheme of unifying musical parameters via their mutual connection with musical rhetoric, the move makes sense, but the utility of such a connection is negligible in practice, as it essentially amounts to a label of a label. For instance, little is gained by labelling a sequence "gradatio" when neither the composer nor audience may share such a conception; a fact made especially poignant in cases when the music is not structured to reflect the function as it would occur in speech.

Orchestration/Instrumentation/Texture

Throughout the classical era, the use of wind instruments in the orchestra steadily grew more common, and the parts assigned to the winds likewise expanded from merely doubling the principal string voices, to having fully independent, or *obbligato*, parts.⁷⁹ The incorporation of winds allowed for greater timbral contrast than with strings alone, and provided composers with new orchestration possibilities. Aside from the simple juxtaposition of contrasting tone colors, the use of all instruments together, or an orchestral tutti, emerged as both a new timbre and texture befitting the nascent ensemble's "broader dimensions of sound and space."⁸⁰ Ratner notes that the novelty and strength of such a combination—which was often used in climactic and intense moments—frequently superseded, and even eliminated, all other musical elements (even melody), as it could easily sustain rhythmic, harmonic, and textural tensions alone. One need only think of a Beethoven finale to find a quintessential example of the sustained orchestral tutti.

Perhaps as implied by the header of this subsection, orchestration (the distribution of material to various instruments), instrumentation (the qualities of specific instruments), and texture (how the layers of music combine) are often marginalized and lumped together. While

⁷⁹ Ratner, 149.

⁸⁰ Ratner, 151.

conventional music theory treats features which can be isolated, like pitch and rhythm, with primary importance, aggregate features such as orchestration, instrumentation, and texture are treated secondarily, if at all. Since these features emerge from a combination of other features, they all exhibit what Timothy Cutler refers to as a “resistance to codification”—or, a lack of precise bounds and quantifiable traits.⁸¹ Assigning preferential value to that which is explicable, or that which can be systematized, is an unfortunate byproduct of the formalism which underlies music theory. Throughout Cutler’s dissertation, he argues that despite its imprecise nature, orchestration can be critically understood in relation to other parameters, and even as part of linear methods such as Schenkerian analysis.

As the present study concerns the Da Ponte operas in particular, the question emerges regarding their specific involvement with orchestration; and in fact, the work of Peter Halpin argues that Mozart’s operas set a powerful precedent both in terms of orchestration and instrumentation.⁸² Especially during his residency in Vienna, Mozart expanded his writing for wind instruments, beginning with compositions for the woodwind group known as *Harmoniemusik* (a contemporary type of wind band originally for the European aristocracy), extending to his mature piano concertos, and finally coming to full fruition in the Da Ponte operas.⁸³ Halpin notes how Mozart “tended to give important structural melodic material to wind instruments” and was thus among the first to grasp the potential of their unique timbre.⁸⁴ It should be noted that the use of wind instruments was not unfamiliar to general European life, as despite its absence in the concert halls and stage, street bands were often *Harmoniemusik*

⁸¹ Timothy Spence Cutler, “Orchestration and the Analysis of Tonal Music: Interaction Between Orchestration and Other Musical Parameters in Selected Symphonic Compositions, c.1785–1835” (PhD diss., Yale University, 2000): 31.

⁸² Peter William Halpin, “The Wind Band in Mozart’s Opera Orchestra: Origins, Function, and Legacy” (DMA diss., University of Connecticut, 2007).

⁸³ Halpin, 96.

⁸⁴ Halpin, 111.

ensembles while military music often included trumpet and drums. These timbres when inserted into the larger orchestra could thus not only be familiar but clearly referential to everyday life. Through detailed analysis of all three operas, Halpin shows how Mozart used particular instrumental timbres to denote specific characters, social classes, events in the plot, and emotional states—while throughout making the point that with each opera, Mozart expanded and progressed in his abilities of orchestration. The particulars of Halpin’s work are too vast to cover here, but it serves to underscore how amenable timbre is to extramusical meaning; or put another way, how timbre readily lends itself to connotative and associative purposes.

Instrumental Forms

Much can be said about the interconnected nature of local-level musical style and macro form, and how one affects the other. But the relationship between style and form is so deeply entangled that any question of whether one causes the other quickly leads to a dilemma of infinite regress. That is, did periodicity lead to sonata form, or did sonata form lead to periodicity? To bypass this chicken-or-the-egg scenario, it can be illuminating to simply match styles with their preferred forms through the ages, such as binary yielding to ternary, sonata, and so on. The Baroque era favored clear juxtaposition, like that found in binary AB forms; but in a nearly opposite manner, also favored more fluid sojourns, like the discursive arrangements found in fugues or fantasias. The classical era continued both of these divergent traditions—but owing to the new tonic-dominant polarity which greatly increased the sense of harmonic arrival—sonata form became favored for its dramatic potential. In terms of degree of articulation, sonata form lies somewhere between the juxtaposition of binary forms and the fluidity of discursive forms, so it may well have prospered as a mediation of the two.

Aside from historical legacy, forms arising from concurrent folk music, concert music, and stage music all influenced one another in the classical era. And within opera in particular, many of these forms could be used together thanks to both the immense length of classical opera and the programmatic content which suggested such references. This is not to say that operatic form was a patchwork quilt, but that it was more like an ideal platform to integrate many forms and styles. Often referred to as “number opera” due to its episodic structure which essentially alternated between speech-like and song-like sections (most commonly recitative and aria); the song-like sections in particular could assume many forms—including folk, national, and concert music, as well as many types of arias. It is due to this synthesized quality that the various non-operatic forms must be understood, for to recognize these forms within the span of an opera is to be one step closer to the audiences and composers who intimately knew them. As there is an overabundance of texts covering musical form, there is no need to reiterate all details here; however, there is one form above all else linked to the classical style—sonata form—and which furthermore appears prominently in the arguments of Rosen and Ratner. Sonata form will be discussed below through their perspectives, with attention given to its numinous status in twentieth-century criticism.

Sonata Form

Sonata form can be divided into two parts based upon harmony, or into three parts based upon melody; and although the debate between the two perspectives has quite a legacy, it is not impossible to accept both views. The bipartite, harmonic division is somewhat general: Part I departs from the tonic to arrive at the dominant (I-V), while Part II returns from instability back to the tonic (X-I). The use of “X” here refers to a harmonically unstable section that is

consistently modulatory, which within the context of opera can be achieved either by an intervening recitative section, or within an aria itself. The ternary, thematic division is more prescriptive: the *exposition* (thematic presentation), is followed by the *development* (thematic variation/departure), and concluded by the *recapitulation* (thematic return). Ratner recognizes that both views are true within their respective domains, and also adds a remarkably lucid observation, stating “the two-part plan emphasizes the *close* of major sections, while the three-part plan emphasizes *opening* statements.”⁸⁵ Accepting that sonata form has both binary and ternary characteristics arises from the understanding that classical harmony and melody support one another; prominent themes frequently mark dramatic harmonic arrivals, and the two together contribute to the structuring of macro form.

While dance-forms of the Baroque routinely modulated to the dominant at the end of the first half of a binary structure, sonata forms modulate roughly “in the middle of the first half” according to Rosen.⁸⁶ The moment of arrival is furthermore an *event* to be clearly expressed, and no longer arrived at with the fluidity of the Baroque. The classical style draws attention to the dominant modulation with dramatic flair, usually by marking it off with a pause, strong cadence, explosion of intensity, or new theme. Symmetrically opposed, the return of the tonic occurs roughly “midway through the second half” and is likewise a significant event which is clearly delineated. Within these two events, or at the center of the work, lies the development section.

Rosen refers to the development section of sonata form as “basically nothing more than intensification.”⁸⁷ While this often means thematic content from the exposition is developed through fragmentation (which leads to extension, imitation etc.) this is by no means a

⁸⁵ Ratner, 220-221.

⁸⁶ Rosen, 71.

⁸⁷ Rosen, 50.

requirement. Rosen finds numerous examples of athematic development sections, and concludes that development sections are not dependent on melodic factors. By using dramatic and dissonant harmonies, remote keys, avoidance of periodic phrasing, and delayed cadences, classical composers were able to subvert listener expectations, and avoid (locally at least) the symmetry so foundational to the style. This essentially casts “development” as a harmonic and rhythmic concept—a notion which elucidates the widespread presence of melodic fragmentation, as this is largely a rhythmic transformation.

To conform to the demands of proportion (and even to reveal its manifestation) classical composers used athematic passagework of scales and arpeggios as a type of conventional, filler material.⁸⁸ While Baroque sequences were obscured with thematic material and motifs, the classical era displayed passagework unadorned, and with a single, clear purpose: to achieve balanced proportions by extending phrases and cadences. As areas of instability grew with extended cadences in the dominant, corresponding elongation of stable areas became necessary to maintain balance. The presence of areas of stability bookending a central region of heightened instability introduces drama into the structure itself, and is a tenet of the classical style which Rosen deems “essential.”⁸⁹

But with large tonic regions of harmonic stability inherent to sonata form, a significant dilemma arises with regards to tension; namely, how to maintain it without dissonance. Tension in music is typically associated with harmony, but it must be carried by other attributes, such as thematic resolution or rhythm, in regions of harmonic stability. As the recapitulation section returns to the tonic, themes originally presented in other keys must be restated/reinterpreted in the tonic, so as to produce closure. Rosen likens this to a rhetorical device, where tonic material

⁸⁸ Rosen, 71-72.

⁸⁹ Rosen, 74.

from the exposition does not require closure, and is consequently omitted from some recapitulations, while dominant material necessitates restatement in the tonic.⁹⁰ Rhythmic tension is the other factor which keeps the recapitulation going, and intensely animated textures are a common feature in these sections. An elevated energy often works in tandem with the general air of excitement as the exposition is reinterpreted as a resolved, tonic entity, no longer dramatizing a move to the dominant.

Rosen argues that when expanded, the classical phrase closely resembles sonata form itself, in that symmetrical resolution balances the opening and closing about a central point, while a harmonic climax occurs at around the three-quarters mark.⁹¹ The opportunity to integrate local and macro levels was not lost on classical composers, particularly Haydn, who expanded notes into chords, and even modulations. Rosen goes on to cite numerous examples of this, such as four quick notes in a theme later becoming eight bars of virtuoso passagework, a sforzando chord in the exposition becoming a pedal point in the development, and a subdominant chord later corresponding to a subdominant modulation. If the content of the phrase suggests a macro form, then the presence of common sonata elements (like a second subject, bridge passage, or closing theme) is only essential when the phrase justifies it. For this reason, Rosen claims that sonata form is the first form to be “shaped freely in response to the smallest parts” and that it is internally, as opposed to externally, imposed.⁹² As such, Rosen not only connects local-level features like rhythm to sonata form, but to various other genres, stating that “the pacing of classical rhythm is the pacing of comic opera, its phrasing is the phrasing of dance music, and its large structures are these phrases dramatized.”⁹³

⁹⁰ Rosen, 75-76.

⁹¹ Rosen, 87-88.

⁹² Rosen, 91, 93.

⁹³ Rosen, 96.

In the prior discussion on periodicity, both Rosen and Ratner were united in regarding it as a core tenet of the classical style; and while for Ratner this remains true, the lofty esteem which Rosen hoists upon sonata form eclipses all else. As discussed, Rosen gives significant attention to the proportions of sonata form, and how all elements of the classical style—functional tonality, thematic development, passagework, periodicity etc.—all work perfectly within its framework. Regarding sonata form as the zenith of the classical era, Rosen finds that “most major forms began to resemble sonatas” such that the concerto, rondo, minuet and scherzo (and even Mozart’s operatic arias and finales) were all affected.⁹⁴ And while many forms did, in fact, assume some resemblance to the sonata, this may be more indicative of processes common to the classical *style* as opposed to sonata *form* in particular.

But even if the sonata was thrust upon all other forms, this should not be assumed to benefit a work’s value, as has been argued over centuries of music criticism. This is an argument based not only in formalism but in the tacit supremacy of sonata form. The allure of the quintessential form of the classical era casts a long shadow, and Rosen is willingly its thrall, as demonstrated by his above statement on sonata-finales. An operatic finale, in returning to the key from which it began, can only create an arch with regards to harmony; but this is fundamentally different from recapitulation, which requires thematic restatement and closure. Furthermore, the narrative arc of a finale often begins with already-elevated tension (itself at odds with the notion of exposition) which only escalates onward and upward, breathless to the curtain. The mounting tension of a finale, surging episodically with each new character, is more like an ascending staircase than the symmetrically balanced, arch-like contour of the sonata.

⁹⁴ Rosen, 51.

Overall Form

Many theories have been entertained concerning the coherence of a work at the largest, structural level. Perhaps the most widely known is Schenkerian analysis, which contends that an underlying structure, or *Ursatz* forms the basis of coherence for tonal works. This consists of a simple counterpoint commonly represented as a linear descent of $\hat{3} - \hat{2} - \hat{1}$, accompanied by a simultaneous harmonic shift from tonic to dominant and back, or I - V - I. Schenkerian analysis often involves reduction of the score (or foreground level) into prolonged pitch-events which articulate the *Ursatz* more clearly at progressively lower levels, until the fundamental structure is ultimately revealed at the background level. The particular features of a work are given meaning as elaborations of the *Ursatz*—a simple contrapuntal sequence which simultaneously produces coherence within the piece and connects it to the whole of tonal classical music.

The claim of such a grand design has understandably produced divisive reactions, and explains equally its most ardent champions and bitter rivals. Critics of Schenkerian analysis have questioned the presence, perceptibility, and importance of a fundamental structure while also finding the theory dogmatic and impersonal—not to mention that it is an ahistorical concept arising only after the classical era. Ideally though, the proper application of Schenkerian analysis should uphold the importance of local features through their connection to an underlying, linear design, but its highly reductionist nature often continues to trouble critics. Even Rosen, a champion of grand design, is among those unconvinced, admitting “proponents of linear analysis would never claim that the basic line is directly heard in the foreground of our consciousness, but it is disquieting when an analysis, no matter how cogent, minimizes the most salient features of a work.”⁹⁵ While defenders of the theory may claim this as a mere misunderstanding, the fact

⁹⁵ Rosen, 35.

remains that various principles—even structural ones such as proportion, dramatic movement, and motive—are left woefully unaddressed by Schenkerian analysis.

Aside from structures based on harmony, motivic development can provide thematic unity in a work as well, while also lending additional coherence between melodic and accompaniment material. Rosen believes that the motif has been “a principal means of integration in Western music since the fifteenth century” but he dismisses it (and Schenkerian analysis) as being the sole principles of unity, since they are “too partial to be satisfactory.”⁹⁶ In Rosen’s view, the listener’s experience, which necessarily unfolds through time, must not be overlooked; that is, the dramatic discourse of events which suggest form and proportion must be attended to as temporal, and not spatial, entities.

Operatic Forms

Though with a much keener eye for aesthetic and musicological considerations than his predecessors (and notably less formalist as well), Ratner still brings an instrumental-bias to operatic analysis which is strongly typical of nineteenth- and twentieth-century criticism. But as argued at the start of the present section, the alacrity with which the modern age discards dated thought can overlook the capacity for such thought to represent similarly dated ages. Fitting analysis to the material in question is not necessarily equivalent to current trends in analysis. These dated perspectives often equally contain astute observations and dubious logic, and will thus be presented in conjunction with more modern sources where necessary. In this manner, the multivalent approach of the present research is not just of multiple domains (music, drama, context, and so on) but of multiple ages of thought.

⁹⁶ Rosen, 39, 42.

Aria

Ratner describes the full *da capo* aria (ABA) as perfectly suited for emphasizing static, monumental emotions, owing to its two A sections being only divided by a brief B section—which acted much like a starkly contrasting interlude. With every section closed emphatically, the full *da capo* aria loomed large over Baroque opera, but as classical composers sought more dynamic and flexible forms (to better admit dramatic action into the aria) a compressed version of the *da capo* emerged.⁹⁷ Strongly resembling sonata form, the compressed *da capo* aria removed internal repetitions, and only fully closed the form at the conclusion of the piece. Critically, the internal B section could now act like the development section of a sonata, presenting a continuation and development of the tensions generated in the first section, as opposed to just a static, juxtaposed expression.

Ratner notes that in certain situations where the traditional effect of two opposing sentiments was desired—with the middle section set in a contrasting style and tempo—classical composers would still turn to the *da capo* aria, but again, with internal repetitions removed.⁹⁸ This retained the function of the conventional aria, even as the form remained compressed and somewhat less imposing. If, on the other hand, no contrast of affect was desired, the middle section could be removed altogether; effectively creating a further compressed aria form of AA'. Perhaps the shortest reduction of the aria was the cavatina, which had neither a contrasting section, return section, or melodic recall. But not all arias reflected a *da capo* lineage; in situations with a particularly tuneful melody, the principal period could be alternated with contrasting sections in order to produce a rondo form, or ABACA, which reflected more of a dance or song heritage.

⁹⁷ Ratner, 276.

⁹⁸ Ratner, 279.

Figure 2.4. Aria forms related to the *da capo* (as designated by Ratner)⁹⁹

Full *da capo* aria, ABA:

- thematic (abab // c // abab)
- harmonic (I-V, V-I // X // I-V, V-I)

Compressed *da capo* aria, ABA:

- thematic (ab // c // ab)
- harmonic (I-V // X // I-I)

Further compressed aria, AA':

- thematic (ab // ab)
- harmonic (I-V // I-I)

Cavatina, A:

- thematic (abc...etc.)
- harmonic (I-V, X-I)

While Ratner's account of aria formal patterns—and how the classical era shifted away from the *da capo* and toward more “compressed” or sonata-like forms—is not incorrect in a general sense, it does require some careful course-correction. Perhaps the most obvious omission is any consideration of how the text and poetic structure factor into the musical form; and likewise, there is the sadly familiar sense that operatic forms are being boxed into instrumental ones, as evidenced by the frequent references to sonata form. Too often, the role of libretto in determining musical form is often considered secondary to the composer's musical goals. Notably, Tim Carter advocates for a more sensitive approach to text by examining the arias of *Idomeneo*, and placing them within a historical context.¹⁰⁰ By considering text there is, of course, an additional factor at play; and while one may assume this would complicate the formal patterns above, it actually has the opposite effect—it unites them. Carter remarks that text is nearly always “in the standard two-stanza format that was the norm for arias from the last quarter

⁹⁹ Ratner, 276-280.

¹⁰⁰ Tim Carter, “Two into Three Won't Go? Poetic Structure and Musical Forms in Mozart's ‘Idomeneo’,” *Cambridge Opera Journal* 24, no. 3 (November 2012): 229-248.

of the seventeenth century on.”¹⁰¹ And so, by giving attention to how each form treats the two stanzas, the decisions of both librettist and composer can be elucidated.

The logical “issue” for librettists creating two-stanza arias is that if, for instance, stanza 2 offers a markedly different perspective than the first, then returning to stanza 1 at the end of the aria can imply some sort of withdrawal or negation of stanza 2. And while this is not an issue in itself, the difficulty is in producing any other form of logic, such as a progression. As *da capo* arias had long been constructed in such a manner, librettists developed methods for returning to stanza 1 with some level of reinterpretation, and without necessarily negating it. Carter points to the precedent set by librettist Pietro Metastasio, who placed more personal statements in the first stanza, and more general maxims, or lessons learned from the specific situation, in the second stanza.¹⁰² By shifting between personal and general, the final return back to the personal statement becomes one of emphasis and fortified certainty, or of deepening resolve. The much-maligned static nature of the *da capo* aria is thus somewhat exaggerated in modern criticism, but the form is nevertheless limited by ending with stanza 1; and so, it is unsurprising that the forms which would come to supplant it had more of a dynamic nature, and some even ended with stanza 2. These new forms, more specifically, were the compound-ternary and compound-binary, and—as can be seen in the table below—the compound-ternary hewed much closer to the *da capo* by ending with stanza 1, while the compound-binary ended with stanza 2.

¹⁰¹ Carter, 234.

¹⁰² Carter, 235.

Table 2.1. Aria forms based on stanza structure (as designated by Carter)¹⁰³

Ternary (*da capo*)

Section:	A		B	A (<i>da capo</i>)	
Stanza:	1	1	2	1	1
Key (if major):	I–V	V–I	X	I–V	V–I

Compound-Ternary

Section:	A		B	A	
Stanza:	1	1	2	1	1
Key (if major):	I	V	X	I	I

Compound-Binary

Section:	A	B	A	B
Stanza:	1	2	1	2
Key (if major):	I	V	I	V

Regarding the above forms, it must be conceded that the articulated tonal regions in the compound-ternary and compound-binary forms, and especially the tonal progression of the compound-ternary form, bear some semblance to sonata form. But their manner of use, when accounting for text and plot, appears to be essentially dramatically-minded, and much less of a solely instrumental entity. By comparing how Mozart chooses to set texts across *Idomeneo*, Carter suggests the following: for older characters (and their correspondingly older singers) Mozart favors ternary; for second stanzas which move away from the personal, and are more generalized or Metastasian in nature, Mozart again favors ternary; but in cases where the second stanza develops the plot, or else becomes more poignant to the ensuing action, Mozart favors binary.¹⁰⁴ The choice is essentially one of relevance to what will follow, and whether the first or second stanza is more suitable to that goal, resulting in the choice of ternary or binary, respectively.

¹⁰³ Carter, 235.

¹⁰⁴ Carter, 238-241.

Recitative

When vocal lines are more song-like than speech-like, the demands of melody and other musical features tend to take precedence. The result is much more musical, but also less realistic in modelling actual speech. Generally speaking, this sets up a spectrum with “pure” music on one side and “pure” speech on the other; and in narrative forms like opera, this produces an innate conflict between musicality and naturalistic drama. Since the aria of the classical era tended to be more song-like, it was less capable of depicting plot naturally—and thus the duties of plot were often given to the recitative. It should be noted however, that the absolute binary between recitative and aria (that of dynamic, dramatic action followed by static reflection) was never purely extant even in the Baroque, and was further undermined in the classical era, as the above discussion on aria forms demonstrates.

Recitative could accommodate varying degrees of musicality in the classical era; ranging from *secco*, or “dry” (which was accompanied only by slow continuo chords), to accompanied (which adds sustained harmonies in the strings), to *arioso* (which adds moments when the vocals become more melodic or melismatic), and finally to obligatory (which adds the whole orchestral ensemble and even more melodic action).¹⁰⁵ Though some sources do not distinguish between accompanied and obligatory recitative—or else disagree with various aspects of the above definitions—the basic idea that recitative is primarily concerned with dramatic action, and also with proper declamation, which varies from speech-like to song-like, is ubiquitous. Though usually notated in common time for convenience, recitative has no fixed or regular meter, since it mimics the patterns of natural speech. But aside from functions associated with plot and text, recitative also provides an oft-overlooked harmonic link between adjacent numbers.¹⁰⁶ Liberated

¹⁰⁵ Ratner, 316-317.

¹⁰⁶ Ratner, 319.

by the relatively free rules of harmony within recitative, the music flows smoothly through cadential and meandering chord progressions; beginning in the preceding key and ending in (or at least preparing) the following key.

The scant attention traditionally afforded to libretti extends—perhaps even more so—to recitative, which has often been viewed merely as connective tissue, and essentially unworthy of focused analysis. This has, in more recent years, been redressed in various manners, with two notable contributions requiring brief mention here. First, Laurel Zeiss suggests a “permeability” concept on the basis that recitative-aria pairs often exhibit musical and dramatic continuity starkly at odds with conventional closed-form analysis.¹⁰⁷ She constructs her argument from established formal, tonal, and dramatic views on *Don Giovanni*’s blurred lines before conducting her own score analysis on three recitative-aria pairs; and concludes that it contains an intentional use of tonal continuity which may not be understood at either the macro or local levels, but at a midground. Second, Sean Cooper focuses solely on Mozart’s “*secco*” recitative, which—as he immediately points out—was not a term used until about half a century after Mozart; thus, making preferable the historically-accurate term, “*recitativo semplice*.”¹⁰⁸ Cooper examines the Mozart-Da Ponte operas in particular, and finds that, aside from the harmonic continuity argued by Zeiss, the recitatives function as critical moments of characterization. Through melodic and harmonic interruptions by continuo or orchestra, Cooper finds correlations between the character present and the tonality chosen; furthermore, the particular rhythmic patterns of speech are shown to be unique to each character. For yet further evidence of Mozart’s intentional

¹⁰⁷ Laurel Elizabeth Zeiss, “Permeable Boundaries in Mozart’s ‘Don Giovanni,’” *Cambridge Opera Journal* 13, no. 2 (July 2001): 115-139.

¹⁰⁸ Sean David Cooper, “The Virtue of Recitativo Semplice in the Operas of Wolfgang Amadeus Mozart” (DMA diss., The University of Memphis, 2009): 1.

characterization in recitative, the author provides comparisons to contemporaneous works which show far less consistency for specific characters.

Composite Forms

Owing to both their significant duration and variety of material, the composite forms of multi-movement or multi-section works, like those of symphonies and operas, were generally not governed as rigorously as single forms in the classical era. Unity of composite forms was ensured primarily through three means: thematic connection, cadential links, and key relationships.¹⁰⁹ Thematic connection was least common among the three, but Ratner finds instances of thematic transformation by Haydn and melodic return by Mozart and Beethoven. While these melodic devices were infrequent, harmonic cadential links were essentially ubiquitous in the classical era. And although the overriding preference for smooth motion which prepared the next key could be achieved by any cadence type, the use of the half cadence to link adjacent movements was especially pervasive. In cases where the subsequent key was not prepared by cadence (Ratner cites the Beethoven B \flat major Quartet, Op. 130), the effect was often intentionally jarring and abrupt, with sharply delineated movements that defied conventional expectations.

On a more macro level, the key of each individual section was connected to the prevailing key of the whole work. Much like a chord progression on a grand timescale, classical multi-movement works began and ended in the same key, with intervening sections permitted more flexibility. Ratner points out that the majority of relationships were close, but in situations with more distant, chromatic relationships, the sections became imbued with “something of the

¹⁰⁹ Ratner, 323-325.

nature of the fantasia, extending the fantasia element *within* movements—far-reaching digressions—to key relationships *among* movements. The remote key can be matched by a strangeness of affect.” While Ratner does not explicitly refer to tonal planning here, he does go on to discuss what he calls a *grand plan* in which “the keys of the successive movements trace a cadential path.”¹¹⁰

Ratner’s brief discussion of the second act finale in Mozart’s *Figaro* with regards to a grand harmonic plan is particularly enlightening, and essentially identical to a description of tonal planning. He describes how the rivalry between the Count and Figaro is mirrored by their respective keys of E♭ and G:

This principal idea, in which the Count is victorious at the end of the act, is represented by the key of E♭ major, which opens the finale and which prevails at the end...The first section is in E♭ major; the second and third are in B♭ major. Suddenly there is a shift to G major, a point of furthest harmonic remove, as Figaro enters to shatter the temporary victory of the Countess and Susanna. Then the keys run down the circle of fifths to the initial E♭ major as the denouement runs its course.¹¹¹

The finale’s harmonic form is thus essentially bipartite (I-V, X-I), or what Ratner often refers to as a “key-area plan,” with G major standing in as the “X” section. But the constituent sections within the finale (Ratner counts eight in total) are also complete forms unto themselves, representing each additional character and complication with corresponding shifts in musical material. The result is “probably the most celebrated example of composite form in opera,” as each self-contained section operates within the overarching tonal plan.

¹¹⁰ Ratner, 323 and 325, respectively.

¹¹¹ Ratner, 330.

Overall Operatic Form

The audibility of tonal relations, especially over larger spans of time, is certainly questionable for listeners without perfect pitch; but performers have recourse to the score, and are much more likely to notice temporally distant relations. Accordingly, music which foregrounds the performer, such as a string quartet, often features more obscure and distant relations than publicly-minded forms such as an opera or symphony. But even equipped with this understanding, performers can only emphasize tonal relationships as much as the written page allows—which is to say that emphasis is rather limited. Given the particular importance and clarity of tonality in the classical era, it is thus unsurprising that composers developed various methods to prevent these relationships from going unheard. Rosen shows how Mozart makes his tonal plans more explicit, and easier to grasp, with the aid of thematic, timbral, and textural allusions within *Don Giovanni*, as discussed below.¹¹²

For example, the basic key of *Don Giovanni* is D, and the key's reappearance is often marked with musical features from the opening of the opera. The key, and its various features or sonorities, is thus linked to the dramatic event which takes place in the opening—the death of the Commendatore. A soft drum-roll on the timpani accompanied by trumpets, and a shift to D minor are enough to immediately conjure that initial scene. Donna Anna (the Commendatore's daughter) is also associated with the timbre, as her entrances are almost entirely in D. All of these methods can be seen at work in the E \flat sextet, which should be noted, is suggested by Rosen to be in sonata form.¹¹³ Timpani and trumpet mark the initial modulation to D major (m. 28), while the main theme of the overture is later alluded to by Don Ottavio (m. 40), and the eventual shift to D minor (m. 45) coincides with the entrance of Donna Anna. Despite the sextet occurring

¹¹² Rosen, 297-301.

¹¹³ Rosen, 296.

in E \flat , it modulates to the leading-tone, remote key of D in order to vividly recall the death of the Commendatore. While listeners may struggle to identify pitch material in isolation, the sheer number of thematic, timbral, and textural associations Mozart includes ensures that more (if not most) listeners perceive the symbolism.

Rosen argues that harmonic structure and formal proportions are prioritized in the classical era, such that any other considerations (melodic or otherwise) are rendered subservient.¹¹⁴ That is, the only rules of the classical language are of resolution and proportion within closed forms. The classical ending, a region of clear tonic stability sustained by an animated texture, thus served both to resolve long-range dissonance and to create a balanced, closed form. Its duration scaled directly according to the size of the preceding exposition and development sections, as a means to preserve proportions. In effect, the classical ending pushed the overall placement of the harmonic climax (locally within the end of the development) away from the end of the work and toward its center. The centrally-positioned climax of the classical era is thus often found somewhere from the center to the three-quarters mark, and is a defining feature found at all levels of structure: phrase, section, movement/act, and whole work.¹¹⁵ So although classical structure is commonly referred to in terms of harmonic symmetry, balanced proportions, and closed forms (to name just a few); in a somewhat coarse way, it is essentially just these expanded and dramatized middles and ends which define the structure of the style. Rosen argues that this is clearly reflected in changes which came to classical opera forms such as the aria, finale, and even the whole operatic structure—as discussed below.

Arias with moderate to slow tempi and faster concluding sections gained more prominence during the late eighteenth century; for example, Andante ABA (tonic-dominant-

¹¹⁴ Rosen, 295-296.

¹¹⁵ Rosen, 306.

tonic) followed by Allegro (tonic). The form loosely mimics a sonata, in that it moves to the dominant ahead of a central climax while also sustaining an ending tonic section with rhythmic energy and virtuosity. Though the slower section itself is ABA, Rosen argues that it does not function like either a *da capo* aria or conventional ternary form; as the B section moves to the dominant, has the thematic character of a “secondary group,” and is occasionally even followed by a developmental section preceding the return of A.¹¹⁶ Similarly, the concluding tonic section in a faster tempo may at first be assumed to be a coda or independent section, but Rosen sees it as a harmonic substitute for the “missing” recapitulation of B. Rosen also points out that Mozart’s early arias adhered to sonata form overtly and crudely, only later striking a compromise with the demands of drama and text, and thus implying some intentionality by the composer.

The operatic finale gained new significance in Mozart’s hands—he conceived of the finale as a unified movement always beginning and ending in the same key, while also expanding its duration and increasing its intensity and complexity.¹¹⁷ By utilizing similar forms and principles found in symphonic and chamber music movements (such as the harmonic structure and proportions of the sonata or rondo) Mozart was able to promote continuity in the operatic finale. Accordingly, the dramatic action is often concentrated in these finales, so that the increasing tension of the music has an appropriate counterpart. Rosen even claims that “the arias, beautiful as they are, serve in part only as a preparation for the finale of the act which is the set piece of the occasion.”¹¹⁸ While on one hand this is true—finales become increasingly animated with each additional character on stage, and as all the plot complications culminate in a flurry of shocking realizations, the audience is rendered (hopefully) breathless and amazed. But on the

¹¹⁶ Rosen, 306.

¹¹⁷ Rosen, 95.

¹¹⁸ Rosen, 303.

other hand, if the arias which are no more than decorative groundwork also form a large portion of an opera's runtime, then this seems to negate, or at least challenge, Rosen's cherished grand design.

Nevertheless, Rosen is undaunted in his pursuit to find sonata form in all things, and thus quite predictably—if anticlimactically—argues that Mozart's operas loosely resemble the proportions and tonal symmetry of sonata form.¹¹⁹ The overarching structure of Mozart's operas can be regarded as directly connected to the strongly-prominent finales, which act as critical and articulated events at the macro level. This would explain why the last finale is never the most intense, for it takes place within the “recapitulation” of the opera, and needs to balance the previous instability with a corresponding stretch of tonal stability. The first finale (or for *Figaro*, the second act of four) takes on the role of the “development” section of the opera, and is therefore more elaborate and unstable. In this way, the entire opera loosely resembles a sonata, just as its finales, arias, and phrases do in miniature. In this manner of thinking, sonata form may be rightly considered more of a concept than a strict and concrete form. And while it is easy to disregard Rosen as just another formalist enamored with the sonata, it must at least be admitted that aspects of sonata form can be observed virtually throughout classical music. Whether this speaks to the supremely *patterned* nature of the classical style, or else that the sonata's bipartite and tripartite divisions are quite easily found in all things, remains to be seen.

Considerations of Musicology

Mary Hunter's excellent overview of Mozart's operas is used for background musicological research in this study.¹²⁰ Through opera-by-opera analysis, Hunter continually

¹¹⁹ Rosen, 304-305.

¹²⁰ Mary Hunter, *Mozart's Operas: A Companion* (New Haven, CT: Yale University Press, 2008).

promotes the perspective that operas are products of “practical, social, and aesthetic” factors which shape both their origins and subsequent evolution through time.¹²¹ While not intended to cover every minutia, it does allow Hunter the space to approach the works as “total theatrical experiences”—a macro perspective which aligns nicely with the present research. Particular attention is given to the interaction of social *context* and operatic *content*; and how their entanglement continues onward through time, evolving with each new production, and ultimately unmooring any notion of a fixed musical meaning.

With regards to musical meaning, Hunter offers a surprising number of insights for a more general-purpose text. Through discussions on Mozart’s theaters, social world, and the intervening centuries of productions, she continually reemphasizes that her overarching point is “to suggest the variety of meanings these works have borne over the history of their time on stage and in the public consciousness.”¹²² Productions must therefore consider a number of “simultaneous histories” which are, more specifically: the interpretations of recent productions, the different (and equally valid) operatic versions which Mozart left behind, the history of the world depicted in the opera itself—and perhaps most difficult of all—the question of Mozart’s true intentions, which Hunter argues are, in a strict sense, “almost completely unknowable.” Hunter concludes that due to the remoteness of eighteenth-century culture (especially concerning its theater practice and social class structures) “that even the most rigorous historical reconstructions of these works are, for reasons both inevitable and willed, not really close to ‘accurate.’”¹²³ Hunter goes on to question if the operas are about *particular* historical periods and social circumstances, or if they contain *universal* concepts which can be translated for

¹²¹ Hunter, 5.

¹²² Hunter, 3.

¹²³ Hunter, 4.

modern audiences; and furthermore, what may be gained or lost by assuming either position. Ultimately, Hunter suggests that the debate is not just unresolved, but truly unanswerable—a tension which fuels the very heart of opera.

Aria Types

Hunter identifies five basic seria aria categories which composers could regularly utilize.¹²⁴ The virtuoso aria (*aria di bravura*) showcases vocal prowess through angular and explosive lines. The song-like aria (*aria cantabile*) unfolds with rich melodic sentiment. The declamatory aria (*aria parlante*) expresses highly dignified rage with aggressive rhythms. The *rondò* (which is not the same as the conventional rondo) juxtaposes sections of slow and fast tempos to create a high-style showpiece resembling the later cantabile-cabaletta. Lastly, the *cavatina* tenderly reveals a slower melodic song with a simplified form/presentation.

Within the context of comic opera, a character singing in a seria type could be used to create a subtext, or extra layer of meaning, which could indicate widely disparate meanings: the character may be of high social class, expressing noble sentiment; or, the character may be of lower class, thinking too highly of themselves. In short, the use of a seria form could range from dignifying to mocking a character. Hunter provides an excellent example from *Così fan tutte* showing how these two extremes can be mixed, citing Fiordiligi's *aria di bravura* "Come scoglio" ("Like a rock"):

where she, in all seriousness, swears stony immutability in her affections, but then proves true to comic type by falling for another man. The type itself has a strong dramatic function here because its clear dramatic and social associations lend it meaning beyond the particulars of a given situation or text.¹²⁵

¹²⁴ Hunter, 12.

¹²⁵ Hunter, 12.

Hunter also identifies two aria types exclusive to comic opera: the buffo aria, and what is sometimes referred to as the “serving girl” aria. The buffo aria is most often sung by a bass, which opens with a mock-heroic tune, before accelerating into speech-like declamation, and eventually reaching a full pattering of rapid and repeated notes. Buffo characters essentially progress from pride to humiliation through the course of the aria, as they are “unable to maintain the kind of rhetorical focus characteristic of noble figures” and thus inevitably spin out of control, culminating in incoherent chaos.¹²⁶ Much different than the relatively codified buffo aria, the serving girl aria is a more inchoate form which “lies somewhere between cantabile and buffo” and exhibits a charming, but simple, melody. The content is essentially a naïve account of romance given by a lower-class female character, who either lays out her amorous goals, or explains how to best deal with men. While the buffo aria creates a fateful arc, or downfall, the serving girl aria is much more straightforward and presentational in nature, with a lighter tone overall.

While the expressive and subtextual potential in aria types has been discussed here, it should be noted that their utilitarian aspect—and perhaps their primary purpose—was to act as a musical shorthand for the audience. Hunter argues that just like the conventionalized scenarios of modern television sitcoms, “in Mozart’s theatrical world a clearly-typed aria could telegraph a lot of information to a barely-attentive audience.”¹²⁷ Aria types should accordingly not be understood as underlying features, but as readily apparent categories which allow for quick comprehension and casual entertainment. Furthermore, Mozart’s use of these conventional types in nonconventional manners creates a rich subtext which can easily go missed by a modern

¹²⁶ Hunter, 13.

¹²⁷ Hunter, 14.

audience. Hunter's identification of this subtext in *Figaro* is particularly insightful, and included in full, below.

Figaro's aria battling the idea that the Count can have his way with Susanna, for example, uses the rhythm of the minuet (a noble dance) to tell us that Figaro imagines himself the Count's equal in asserting his right to his own beloved. Or when Zerlina mollifies Masetto by offering to let him beat her in the aria "Batti batti, bel Masetto" ("Beat me, beat me, sweet Masetto"), the tune is well within the confines of the "serving girl" aria type; however, Mozart's addition of a solo cello line in the accompaniment—a feature usually found in arias sung by more noble characters—complicates the merely coy connotations of this text and situation.¹²⁸

High and Low, Serious and Comic

Debate surrounding social class and nationality were of great importance in the eighteenth century, so it is unsurprising that musical criticism also focused heavily on such distinctions. Like generic identities or social statuses which musical pieces could be filed under, distinctions included: old and new styles, strict and free styles, setting-specific styles (chamber, church, and theater), and national styles (Italian, French, and German).¹²⁹ But perhaps no distinction was more important or contested than that of the high and low styles.

The high style was serious, with grand and dignified emotions suitable for the utmost drama. Figures and events were often mythological, biblical, or else historical. The high style was also synonymous with high social status and especially the church, so themes of righteous authority and proper morality were pervasive.¹³⁰ In short, the high style upheld social order and the institutions which governed it.

As to be expected, the low style was generally the opposite of the high style in every sense, while the middle style incorporated both extremes. But Ratner points out that the middle

¹²⁸ Hunter, 14-15.

¹²⁹ Ratner, 333.

¹³⁰ Ratner, 364-366.

style was actually more similar to the high style—but with a freer and gentler demeanor—while the low style was completely “set apart.”¹³¹ The low style was comic, with volatile and humorous emotions suitable for situational comedy. Figures were not “antique heroes” but contemporary and everyday people. Significantly, authority figures were often portrayed mockingly, while the more clever and likeable characters of the lower class enjoyed underdog victories, and even frequently ascended in social status—but, only through proper means, such as newly-discovered birthright.¹³² In short, the low style inverted the social order and maligned the institutions of authority.

Specifically in terms of Italian opera, the high, or serious style was referred to as *opera seria* while the low, or comic style was referred to as *opera buffa*. But while comic opera was originally just a simple intermezzo, it grew massively in both complexity and popularity through the course of the eighteenth century—even coming to eclipse serious opera.¹³³ Such a significant shift can be attributed to many factors, but as alluded to above, the subversive social commentary available to comic opera lent it a particular relevancy and vibrancy which serious opera lacked. With its social appeal, comic opera soon attracted the talents of many high-profile composers, such as Mozart, who incorporated the robust and complex writing previously found in serious opera alone.

This is not to say that mixture between the two styles produced a homogenous, or middle style, as the differences between the high and low remained clearly delineated for expressive purposes. Specific characters or numbers could thus be cast in either style in order to create a subtext; for example, high-born male characters were often made to appear foolish through *buffo*

¹³¹ Ratner, 386.

¹³² Ratner, 393.

¹³³ Ratner, 394-395.

roles, as the contradiction of a low voice leaping about with agility had a comic effect. Throughout comic opera, singers executed quick changes of affect, often at extremes, with “rapid-fire declamation” occurring in short phrases. The orchestral scoring shared a similar agility and variety, with busy figures and sharp contrasts of texture and timbre. The bass voice in particular was featured more prominently than in serious opera, which allowed comic opera to assume a greater variety of vocal sonorities.¹³⁴ The musical forms themselves were condensed and relatively short, rendering the lively atmosphere yet more poignant. In a very generalized sense, comic opera was *dynamic* while serious opera was *static*.

The static nature of serious opera was partly due to the considerable length of full *da capo* arias, which were mostly restricted to expressing grand, enduring emotions. Surface variety came by way of virtuosic and melismatic singing, but featured little of the volatility found in comic opera. For serious opera, dramatic shifts occurred over longer periods of time, or higher levels (unlike comic opera’s moment-to-moment shifts), while characters encountered monumental events. Put another way, the elevated time scale of the music mirrored the lofty nature of the plot. It should be noted that although serious opera was unwieldy in size and lacking in areas where comic opera excelled (social appeal and popularity, musical and emotional variety etc.); that serious opera nevertheless maintained its venerated position as pinnacle of the stage.¹³⁵ Conventionally attracting the greatest talent and quality of writing, the paradox at the heart of serious opera (especially toward the close of the eighteenth century) was a conflict between its reputation and reality.

With fewer productions and waning demand, serious opera foundered even while it continued to command critical respect. Furthermore, many of serious opera’s characteristics

¹³⁴ Ratner, 394.

¹³⁵ Ratner, 364.

found a new home in comic opera, which subsequently flourished in both popularity and quality. In effect, serious opera nurtured the very style which would come to supersede it. To understand such a contradiction, one needs to look no further than the aforementioned association between social status and operatic style. In a strictly musical or artistic sense, mixing the two styles appears both advantageous and benign; but since the serious upholds social order, while the comic subverts it, the mixture of the two could be seen as a grave threat to the establishment. And to those seeking to maintain the “old” ways, that mixture would also be immoral—a transgression of propriety. For many critics of the time, the bawdy themes of the low style were best confined to mere entertainment, and not permitted to taint the noble virtues of the high style. That this was an era when opera would be fervently debated, and also a time when social revolutions against the ruling class would take place cannot be overlooked; for in both cases, the theater of *power* was at play.

Like oil and water, this debate between the high and low styles manifested itself not as a homogenous mixture, but as a dialogue within the music—a stylistic juxtaposition—which became a potent means of expression for composers. Ratner points out that this occurred not only between high and low styles, but also across all musical settings.

Absorption of *seria* techniques into comic opera indicates that a greater number of fine composers occupied themselves with this genre. The invention, sophistication, high style, and skillful working out required in serious music was being carried over into the comic. The reverse was also true. Comic rhetoric—quick juxtapositions of contrasting ideas, short and lively figures, active interplay of dialogue, light textures, marked articulation, unexpected turns—is found throughout the great instrumental and vocal works of the classic style.¹³⁶

The interaction between high and low was thus quite bidirectional; but again, not to the point of creating a homogenous mixture. Retaining their individual qualities, mingling like a peasant and

¹³⁶ Ratner, 395.

a king in musical form—the simultaneous use of differing styles became a potent and popular technique throughout the classical era.

Where Ratner is more magnanimous with regard to serious opera and its exchange with comic opera, Rosen is nearly disdainful. As he repeatedly points to comic opera's influence on the classical style, the absence of references to serious opera becomes conspicuous. And when at last Rosen does address *opera seria*, his view is far from favorable, calling it a “problem” and a “failure” which has long been regarded as “a degenerate form of dramatic art” and now merely exists as “a curiosity on the stage.”¹³⁷ This is followed by a scathing critique of a genre whose only redeemable quality, at least according to Rosen, is in its influence on *opera buffa*. Rosen's argument is as follows: more progressive, comic opera embraced quickly changing moods, but serious opera was belabored by the slow dignity of tradition, and it clung to Baroque conventions which were ill-suited to the new, classical language. While Baroque *da capo* arias presented a succession of static emotions—thus confining dramatic action to the recitative—classical language was suited to dynamic emotions, and allowed for arias with true dramatic action. The mismatch of form and style at the heart of serious opera also crippled its ability to depict its narratives (that is, tragedies) in an effective manner. The large-scale dramatic action of epic tragedy required a coherent, large-scale musical form to match it, but the static numbers of serious opera were not fit to the task.

Rosen's severe dissatisfaction with serious opera is of particular interest because it reveals some of his core, underlying artistic beliefs. The criteria by which he praises comic opera (and the classical style in general) is the same by which he criticizes serious opera. Specifically, it is the belief that artistic value is derived from unity, or coherence. Accordingly, if a work is

¹³⁷ Rosen, 164, 179.

conceptually whole, then even the smallest details will be reflected in the largest forms—such that coherence occurs among and within all musical elements (such as melody, harmony, rhythm, and so on). Furthermore, musical styles and the works they are used to create must not only be natural extensions of their respective languages, but also demonstrative of grand design. That is, a musical language, style, and artistic object must all be unified and coherent, and only with such grand design can musical expression be fully served. For serious opera, this means that the *dynamic* classical language is at odds with *static* Baroque forms, rendering the whole artistic object incoherent, and lacking in musical expression. Rosen neatly sums up the classical style, and its capacity for comic opera, as follows:

The three points that made the new style so apt for dramatic action were: first, the articulation of phrase and form which give a work the character of a series of distinct events; second, the greater polarization of tonic and dominant, which allowed for a much clearer rise in tension in the center of each work (as well as more specifically characterizing the significance of related harmonies, which could then also serve a dramatic meaning); and third, by no means the least important, the use of rhythmic transition, which permitted the texture to change with the action on the stage without endangering the purely musical unity in any way.¹³⁸

In the hands of Mozart, what Rosen views as the issues of large-scale continuity and coherence in opera would be resolved by fusing serious and comic opera together.¹³⁹ With slow-rhythm *seria* characters and quick-rhythm *buffa* characters occupying the same scenes, Mozart's ensemble writing could utilize the same rhythmic transitions and diverse, many-layered textures found in his instrumental music. For example, the comic character Leporello appears in nearly all the serious scenes of *Don Giovanni*, as he lends a quickness of rhythm which would otherwise be missing. But this is not merely for rhythmic variety—beginning with *The Marriage of Figaro*, Mozart was able to produce a synthesis of the *seria* and *buffa* traditions (essentially, their slow

¹³⁸ Rosen, 289.

¹³⁹ Rosen, 179-183.

and fast pacing, respectively) so that the large-scale rhythmic change so fundamental to the classical style could exist. With rhythmic continuity persisting through the closed forms of classical number opera, narratives of large-scale dramatic action could at last find a musical analog.

When taking this synthesis into account, the debate surrounding *Don Giovanni*'s comic and serious merits, for example, can be rendered benign—the opera is simply a work of mixed genre.¹⁴⁰ In terms of casting, most of the characters fluctuate between the two traditions, while Donna Anna and Leporello are more purely *seria* and *buffa*, respectively. For solo numbers, Anna can provide the slow nobility of *seria* just as Leporello can provide the quick volatility of *buffa*, but in ensembles their characteristics can be superimposed, juxtaposed, or transitioned, to name but a few options. The one aspect in which *Don Giovanni* weighs more heavily to a side is in the structure and quickness of *opera buffa*. With dramatic action dispersed evenly and not constrained to the recitative, the opera is free to move rapidly between various configurations of solo and ensemble writing while still maintaining cohesion via large-scale harmonic and rhythmic organization. The predominantly agile framework of the opera owes much to the comic tradition, while the serious tradition appears in moments and characters contained within that structure.

Opera Buffa Context

Comic opera did not, of course, arise from nothingness, and it would be remiss not to mention the traveling comedy troupes, and their *commedia dell'arte* tradition which both preceded and strongly informed *opera buffa*. A cast of stock characters with recognizable masks

¹⁴⁰ Rosen, 322.

and costumes, along with conventional plot templates, allowed the Italian *commedia dell'arte* to be produced easily. Actors could freely improvise dialogue, and the popularity (and corresponding familiarity) which the genre enjoyed extended across Italy—and even to Europe as a whole—from the sixteenth through the eighteenth centuries. Hunter observes that archetypes of this elder tradition can be clearly found even within Mozart's mature opera buffas, stating “Figaro and Susanna in *The Marriage of Figaro* are descendants of Harlequin and Columbine; Don Alfonso in *Così fan tutte* is related to the Doctor; and Donna Anna and Don Ottavio in *Don Giovanni* are the *innamorati* (lovers).”¹⁴¹ But aside from this precedent, comic opera built fervent local audiences; and especially in prominent cities like Vienna, these audiences had specific tastes which shaped the repertoire profoundly.

While both *Figaro* and *Così* were written for the court theater in Vienna, *Don* was written for the National Theater in Prague. Though *Don* did receive a Vienna premier in just the following year, its initial location was partly due to the strongly favorable reception which its predecessor, *Figaro*, had garnered in Prague. Hunter argues that although this discrepancy of location is no mere footnote, Vienna “profoundly influenced” Mozart's approach to *all* opera buffa—as the sizeable orchestra, talented musicians, and vast resources available created a unique operatic environment which informed his subsequent works.¹⁴² But perhaps the most influential factor was the Viennese repertory, which featured the most lauded opera buffa on the same stage and within the same season as Mozart's own. The choice of *The Marriage of Figaro*, for instance, was designed to curry favor with a Viennese audience who adored the eponymous French play it was based on by Pierre Beaumarchais. Even more poignantly, Beaumarchais' prequel, *The Barber of Seville*, had already become an enormously popular 1782 opera by

¹⁴¹ Hunter, 111.

¹⁴² Hunter, 118.

Giovanni Paisiello, a production of which was playing in the same season as Mozart's *Figaro*. No mere coincidence, Mozart's *Figaro* is set up as a clear sequel to Paisiello's *Barber*, with numerous references and connections between the two; and which an informed Viennese audience could not have failed to notice. Although a bit of an exaggeration, it is humorous to view *Figaro* as a simple commercial venture, predating the phenomenon of Hollywood sequels by around two centuries.

Comedy of Situation

Without realism dominating the concerns of dramatic thought, classical opera characters are free from the concerns of naturalistic psychology, and—among countless other, absurd examples—are frequently deceived by simple disguises, found ruminating for interminable stretches of time, and heard proudly singing their inmost thoughts aloud, addressing no one in particular.¹⁴³ This can seem jarring to modern audiences, who expect characters to express themselves and interact in fairly realistic manners. But any changes to pacing at the local level translate to changes in proportions and forms at the macro level, with the opposite being true as well. Furthermore, dramatic pacing tends to produce non-musical forms while musical forms tend to produce non-realistic dramatic pacing. Thus arises the timeless operatic dilemma between musical and dramatic precedence; where their conflicting demands resist complete coordination, rendering any ideal balance elusive. For the classical era—an age which cherished reason and balance—the decision was easy, proportions were primarily dictated by the newfound musical forms, and not free, dramatic pacing. But the demands of music can only partly explain the

¹⁴³ Rosen, 165.

startling lack of naturalistic psychology found throughout classical opera; the full answer to which requires a discussion on comedy of situation in general, and *Così fan tutte* in particular.

The absurd and improbable plot premise of *Così fan tutte* has long drawn criticism to the opera, but its reputation has since been ascendant. Donald Tovey credits Richard Strauss for defending and upholding the opera as a masterpiece of parody and irony which rejected any notions of realism.¹⁴⁴ Strauss' belief that *Così* was criminally misunderstood by the Romantics as a literal work—when its actual value lay in the abstract—would go on to be highly influential. Writing in 1939, Tovey eagerly supports Strauss' interpretation while also recalling another widespread belief that *Così* was merely a conventional response to the earlier and more progressive Da Ponte collaborations. Tovey in turn emphasizes that value in parody is derived from the parody itself rather than the literal events, for “the things parodied are severely limited by irrelevant realities”; and in taking just such a leave from rationality, *Così* stands as “a miracle of irresponsible beauty unlike anything else in Mozart.”¹⁴⁵ Tovey also calls attention to the abundance of ensemble writing, variety of forms, and humorous juxtapositions—such as the alternations between chattering whispers and a faux Hallelujah Chorus found in the overture. The result that all this farcical drama without consequence is necessarily dreamlike found purchase not just with Tovey and his contemporaries, but later with Rosen as well, who sees the opera as belonging to a long tradition of situational comedy, such as Shakespeare's *Twelfth Night*, as discussed below.

Comedy of character was gradually superseded through the eighteenth century by comedy of situation, especially in opera; Rosen attributes this to various developments in

¹⁴⁴ Donald Francis Tovey, *Essays in Musical Analysis* (6 vols. New York: Oxford University Press, 1935-39): 6:30-31.

¹⁴⁵ Tovey, 6:30.

science, drama, and music which neatly coincided.¹⁴⁶ First, in science, the comedy of situation was the perfect platform for the newfound eighteenth-century interest in natural human laws, or the psychology of behavior. Played out like a scientific demonstration, or even a laboratory experiment, characters interact according to universal laws, as opposed to individual psychology. Second, in drama, the rhythm of comic intrigue derived from the *commedia dell'arte* and became an object of primary concern, as it could provide structure to the action through a series of marked events. And finally, in music, what this type of drama necessitated—a lithe deftness of rhythm and emotion within a framework of articulated events—was perfectly and easily suited to the classical style.

While *Figaro* and many other operas of the time exhibited these themes partially, it was only *Così* which would fully embody them, and it actually proved to be the opera's downfall. For even as *Così* premiered, popular taste was swinging back to the comedy of character, and any psychological themes were fast becoming outdated and distasteful; for this reason, Rosen states that *Così* was “the very end of a tradition and had to deal with a changed atmosphere from the start.”¹⁴⁷ For modern audiences (just as those of the nineteenth-century) accustomed to highly individualized characters—classical operas in general, but *Così* most of all—stands to be a disappointing endeavor. But by utilizing *tabula rasa* characters, there is less to distract from the situation at hand and its ostensibly universal nature. In short, focus is detached from the literal plot and instead shifted to a metaphorical and universal truth. To say that Enlightenment artists found this attractive would be an understatement, and it is arguably the central concept (and title) of *Così*. Rosen states that

the eighteenth-century view, by contrast, was a more levelling one: all men are the same, all dominated by the same motifs; *così fan tutti*: they all behave the same way; the

¹⁴⁶ Rosen, 312-317.

¹⁴⁷ Rosen, 315.

differences between Fiordiligi and Dorabella are only superficial, the one like the other will end in the arms of a new suitor.¹⁴⁸

Mozart equally mocks and empathizes with the characters, as their truths are shared by all, and a corresponding balance of serious and comic within the music lends an ambiguous quality to the whole work—perhaps indicating that uncertainty is the most universal truth of all.

Social Class

It should be noted that the high/low distinction referred to by Ratner and Rosen (among many others) is not necessarily incorrect, but vastly oversimplified, leading to the loss of more nuanced social meanings between opera seria and opera buffa. Hunter astutely recognizes that opera seria not only lacked the variety of social strata which opera buffa displayed, but also included higher levels altogether; that is, royalty as opposed to mere nobility. Not unique to the opera buffa of Mozart alone, but “characteristic of the genre as a whole; it both avoided potential problems with royal censors and allowed the action to take place in a world more recognizable to the majority of the audience.”¹⁴⁹ The following discussion will serve as an overview of the basic social classes, and their depictions in opera, beginning with a brief note on social mobility.

While the concealed presence of socially progressive content, or the potentially progressive beliefs of Mozart himself may be debated; Hunter argues that the operatic plots themselves do not make progressive social ideas explicit. Upholding social stratification through clearly delineated roles—critiques of which amounting to nothing more than commentary—the operas contain no evidence of “social mobility via extraordinary work or marriage.”¹⁵⁰ Though there certainly are frequent illusions of mobility, such as Figaro’s ascent via newly-discovered

¹⁴⁸ Rosen, 313.

¹⁴⁹ Hunter, 198.

¹⁵⁰ Hunter, 199.

birthright, these instances still obey the rules of social structure. Of course, political censorship would preclude the possibility of progressive themes, and so their lack of existence is virtually guaranteed. Hunter cautions that any conjecture in the social realm must therefore rely on the implicit, as opposed to just the explicit; a fact which bears noting given the degree to which such themes are discussed in the literature.

Hunter begins with basic, tripartite class distinctions (high, middle, and low) but further divides the high- and low-classes to account for internal distinctions. Figures treated in opera seria such as king, queens, and archaic heroes naturally assume the top spot, but are so flawless and possibly even divine, that they exist more so *over* the system as opposed to *within* it. The nobility class sits below this, and features a huge range of levels, from just-below royalty, to just-above the middle-class. Nobles are more commonly found in operas than royalty, especially in opera buffa, as they are flawed and imperfect rulers who can rise to meet the expectations of their station, or else dramatically fail to do so. The middle class of professionals and artisans (doctors, merchants, innkeepers, musicians, carpenters etc.) enjoy financial independence, but share none of the official ruling capacities of the nobility. Although curiously avoided by Mozart (discussed at length below) the middle-class was a fairly regular feature within Singspiel and opera buffa. Lastly, and at a great distance below the middle-class, are the servants and peasants which constitute the low-class.

The distinction between these two is very significant, as servants run the households of nobility—and are thus granted intimacy—while peasants tend the lands, and are distant or removed. The servants are familiar and viewed as having a childlike capacity, whereas peasants are shunned and treated essentially as animals. Mozart focuses primarily on just two of the discussed classes (the nobility and their servants) within his opera buffa, and it is for this reason

that Hunter refers to them as the nobility-class and serving-class. When these classes are simplified to high- and low-class, the function and relationship of the two is entirely lost. For example, Don Giovanni and his *servant* Leporello stumble upon the *peasant* wedding of Masetto and Zerlina, where the Don's subsequent advances are met positively by Zerlina; and without understanding that the gulf between Leporello and Giovanni is scant relative to the astronomical gulf to Zerlina, audiences may be inclined to judge Zerlina harshly. That is, since Leporello can see through the Don's guise then so should Zerlina, if they are in fact of the same station.

Noble characters are expected to strive for the lofty ideals of their class, including common ideals such as: the capacity for self-sacrifice, generosity, eloquence, and restraint.¹⁵¹ Though these are not gendered, two other ideals typically do apply to specific genders: male characters are more associated with honor and female characters with fidelity. The degree to which noble characters can conform to these standards creates an evaluative measure—or a metric, which was an essentially ubiquitous feature of the time that allowed audiences to appraise high-born characters. Though this may suggest that noble characters were blank figures inviting moral and social judgement alone, this would negate their other primary purpose: to ignite the sympathies of the audience.

In fact, the comic roles which provide entertainment and action through witty schemes are far more archetypal, as these characters were often drawn from the *commedia dell'arte* tradition, as discussed above. The noble characters are therefore given a more robust characterization, focusing on underlying emotions and expressive sentiments, or a depth of internal conflict. While modern audiences may gravitate to the comic characters who are more readily-likable than their restrained rulers, and then presume that this amounts to a critique of the

¹⁵¹ Hunter, 200-203.

ruling class, this would be a grave error. For the noble characters are not just moral and social models, but fully-realized characters who are designed to gain the audience's sympathies; and so, when the character succeeds, fails, or even rejects those noble ideals, the audience is more invested and impacted by that action.

In contrast to the nobility-class characters, the serving-class characters have no comparable metric, and are thus freer to mock or deviate from noble ideals. Existing somewhat outside of morality, serving-class characters are childlike, and lack the inhibitions of the nobility, rendering them essentially immune to the same level of judgement and consequence. Serving-class characters frequently act on carnal desires—and for all the food, drink, and sex they enjoy, these characters are “largely absolved of moral responsibility”¹⁵²; so even while Don Giovanni is literally dragged to hell for his own immoral actions, Leporello's assistance in those endeavors (though forced) goes unprimanded.

Often clever and quick-witted, servants (and especially the female characters) prove their ability to survive through well-laid plans. While serving-class male characters tout their schemes, noble aspirations, and critiques of the ruling class in a somewhat tactless or brusque manner, they are often thwarted by their own lack of resolution and cunning; and frequently outdone by their more-covert female counterparts. An aria by a high-class character may likely involve inward reflection and subsequent revelation, but an aria by a low-class character who lacks that same self-awareness, instead consists of: “making accusations...taking on an inappropriately high-class manner or form...or expressing a set of values that resist sympathy.”¹⁵³ Low-born characters provide entertainment and comedy through their actions more so than their emotions,

¹⁵² Hunter, 203.

¹⁵³ Hunter, 204.

and their relative immunity to moral and social ideals allows those themes to be explored more fully through the high-born characters.

Hunter observes that Mozart's operas depict "the principle rather than the reality" of social stratification, as they exhibit oversimplified and clarified class distinctions.¹⁵⁴ To some degree though, this should be expected in a functional sense—allowing for ease of comprehension—but what is less explicable, and particularly striking, is the near-absolute omission of the middle class. In an age which saw the emergence of an economically independent middle class (artisans and professionals alike) one would expect contemporary opera roles to reflect such a change; and in fact, both the Singspiel and opera buffa traditions commonly did depict both middle-class settings and characters. Furthermore, Mozart himself belonged to the middle class, and yet he exclusively chose libretti which featured only the nobility or serving classes; the sole exception of which being the very minor characters Bartolo, Basilio, and Don Curzio in *Figaro*. Hunter addresses the omission of the middle class, arguing that "the incompleteness of Mozart's operatic social world reveals an ideal in which the levels of society are both perfectly distinct and perfectly interdependent."¹⁵⁵ In short, the serving and nobility classes create two halves with vast dramatic potential, as the two classes naturally live and work in the same intimate settings.

As far as the depictions of the classes themselves, and how authentic those depictions may be, Hunter finds Mozart's operas to be relatively accurate except in the depiction of peasants. The nobility- and serving-classes, as one may expect, are in reality more varied and complex than their operatic representations. But the depiction of peasants in opera amounts to a pastoral fantasy for its aristocratic patrons, completely removed from the harsh economic

¹⁵⁴ Hunter, 204.

¹⁵⁵ Hunter, 206.

realities imposed on the peasant-class, who “typically lived short, miserable lives on the edge of starvation.”¹⁵⁶ The rural scenes in *Figaro* and *Don* are thus glamorized and inaccurate, designed to assure the noble patrons and the classes below them that the social system was just. To their credit however, the easily-manipulated and acquiescent peasant characters (such as Zerlina bending to Giovanni, as discussed above) would have been a plausible portrayal given the power dynamic between the two.

In the translation of Mozart’s world for modern audiences, the serving-class characters are more-easily relatable due to “their concern with the dailiness of living.”¹⁵⁷ And while audiences may lose the poignancy of some of the serving-class jokes without an understanding of the social structures which bound those characters; there is nevertheless a direct, active, and comedic aspect to them which is readily appealing. Noble characters who abuse their power (such as Don Giovanni) are also easily translated, as abuses of power—unfortunately enough—are still quite rampant. But noble characters who act admirably and hold true to their station present a major challenge for modern audiences, who often find these characters insouciant at best and callous at worst. Hunter argues that this is due to the concept of “noble simplicity” which grew in popularity through Gluck’s reform operas, and opposed ostentatious displays of wealth and extravagant emotions in favor of a reserved, and proper composure of self.¹⁵⁸ The insinuation that admirable qualities, such as a stoic character, are only bequeathed by high social status; and that the socially privileged class is also morally superior, has little to no favor in modern society—making noble simplicity a difficult concept to translate.

¹⁵⁶ Hunter, 206.

¹⁵⁷ Hunter, 210.

¹⁵⁸ Hunter, 211-212.

Case Study: *Don Giovanni*

Don Giovanni, perhaps more than any other Mozart opera, has commanded a formidable reception history, owing in no small part to the title character himself. Alternately hero and villain, the disparity of views toward the Don are striking, and perhaps speak more to his compelling nature than any other aspect. Whether the opera itself is comic or serious has also received extended attention, fueled historically by the nineteenth-century practice of omitting the stock *lieto fine* ending (or, the conventional happy ending) which follows the Don's damnation.¹⁵⁹ These questions in many ways are complicated by the (much-debated) ending; as with it included, moral justice triumphs, but without it, the Don is nearly transcendent—a defiant anti-hero to the end. In a notable observation, Waldoff credits these debates for the continuing attraction to the opera, stating

To deal with the ending and the other questions the opera raises, I believe, we must acknowledge something important that we have learned in a post-structuralist critical age—not only that meaning is ambiguous, and that contradiction and critical difference are inherent in works of art, but that we have a particular fascination with the indeterminacy that often haunts great works. We are drawn—and not only in the late twentieth century—to great works of art that appear to be divided against themselves, works that seem to undermine the very truths they attempt to assert.¹⁶⁰

Perhaps for its indeterminate nature, *Don* features prominently in both Ratner and Hunter, and offers the present study an opportunity for case study. Extended attention will thus be given to *Don* on the basis that it allows the various music theory and musicology threads, all explored in the above section, to be assembled and applied in a concise manner. Ratner's sweeping analysis guides the direction of this section, with Hunter and Waldoff providing contrast and depth. In combination, these various stances suggest points found not so much individually, but in dialogue, or as a sum of their parts.

¹⁵⁹ Waldoff, 174.

¹⁶⁰ Waldoff, 177.

Ratner points out that Mozart and Da Ponte's decision to set the story of *Don Giovanni* was hardly an obscure choice, as audiences of the time were well-acquainted with it.¹⁶¹ Not only were there recent treatments by high-profile playwrights and composers—including Molière and Gluck—but also the characters of *Don Giovanni* closely resembled stereotypes drawn from the *opera seria* and *commedia dell'arte* traditions. Of the characters in *Don*, five are high-born (Commendatore, Donna Anna, Don Ottavio, Don Giovanni, and Donna Elvira) and three are low-born (Leporello, Zerlina, and Masetto). Of these, Ratner argues that only the Commendatore and Masetto behave entirely in line with their status, while all the other characters betray their respective positions by varying degrees.¹⁶² Ratner's account of each status betrayal will be detailed presently, as it strongly informs his analytical stance on the opera as a whole: Anna's vow for retribution and hatred of the Don is so consuming that it clashes with her nobility, even taking on aspects of obsession and concealed fascination. Her fiancé, Ottavio—who would assumedly share a similar fervor—is instead mostly passive in Anna's quest, and thereby shirks his role as heroic tenor. Ottavio's accessory nature and lack of zeal is further emphasized in contrast to the other four male characters, who all exhibit a greater conviction with comparatively deeper voices. For both the immoral Don and absurd Elvira, their actions and emotions (like Anna's) fall so far outside the conventions of their high-born status as to be removed from it completely. And in terms of low-born characters looking to ascend, or that of upward mobility, Leporello constantly envies the Don's status while Zerlina is receptive to the Don's advances, even despite the fact that it occurs on her wedding day with Masetto.

As far back as E.T.A. Hoffman in the early nineteenth century, and continuing in various degrees to the present day, there is a reading which may be termed the “weak” or “ineffectual”

¹⁶¹ Ratner, 398.

¹⁶² Ratner, 397-398.

Ottavio and it can be summarized as such: Donna Anna (Ottavio's fiancée) is secretly infatuated with Giovanni; this therefore places Ottavio in direct competition with Giovanni; and in comparison, the machismo of Giovanni easily defeats the delicate Ottavio. Hunter takes issue with this long-standing reading of Don Ottavio as a feeble and deficient character, arguing that this reading fails to recognize Ottavio as an embodiment of the "noble simplicity" concept. Noble simplicity, as discussed previously, was the popular belief that the nobility-class should not express itself through ostentatious wealth or exaggerated mannerisms, but through restraint and stoicism—reflecting a superiority of character. When viewed as "an admirable exemplar of a social type rather than an insufficiently manly man," Ottavio actually counterbalances the ignoble Giovanni, and appears to express genuine love for Anna—albeit in a manner appropriate for their station.¹⁶³ Ratner's belief, as discussed above, that only the Commendatore and Masetto adhere to their stations, glaringly omits Ottavio in light of Hunter's argument, which is further detailed below.

Hunter finds many insights concerning noble simplicity and Ottavio through the character's two arias: "Il mio tesoro intanto" for the original Prague version, and "Dalla sua pace" as its substitute in the Vienna version.¹⁶⁴ In the Prague version, Ottavio's steady and deliberate resolution to exact revenge on Giovanni finally culminates at the end of the opera with a powerhouse virtuoso number, as if the floodgates have been opened. In the Vienna version, which was possibly changed due to the difficulty of the Prague aria, Ottavio sings much earlier in the opera; when he first hears of Giovanni's assault of Anna, Ottavio sings not with the expected rage, but with sincere beauty regarding his love for Anna. Both arias demonstrate Ottavio's restraint and noble simplicity in different ways; the Prague version shows the moment

¹⁶³ Hunter, 211.

¹⁶⁴ Hunter, 212-213.

he is finally overcome, while the Vienna version shows his resolution and capacity, with no moment of faltering, and no need to further prove himself. However, modern productions often have Ottavio sing both numbers, and Hunter argues that this creates a somewhat incongruous effect which undermines Ottavio's noble simplicity.

Though discussing "fine" details may imply they are of lesser significance, it is in these very details that one can find—for instance—a reading for Ottavio which is not only comprehensible, but favorable. If the existence and translation of meaning is to be taken seriously, then it must be acknowledged that the infinite array of details attendant to but a single musical work cannot be fully known. And furthermore, that the various meanings arising from that unknown horde are potentially of such great consequence that even the most basic, agreed-upon, and apparently immutable meanings of a work must be regarded as no more than illusory.

* * *

Returning to Ratner's analysis, scope again returns to macro considerations, and especially to tonal plans. Questions of intentionality and perceptibility are not raised, nor is the structural significance of tonal plans challenged. In the following section of the present study, just such a critical understanding of tonal planning will be procured; but Ratner's approach—aside from epitomizing an elder tradition—yet houses a profusion of insights within its cracking edifice. For now, these tenets will be entertained and followed to completion, and only in the subsequent section directly challenged. First, Ratner identifies the following keys as being symbolically and consistently used throughout the opera; with the *principal* keys exhibiting the strongest consistency, the keys of *association* exhibiting somewhat lesser consistency, and the keys of *situation* being used only sparingly, such as in isolated and significant moments.¹⁶⁵

¹⁶⁵ Ratner, 398-399.

While he does not explicitly organize the keys into three categories or provide labels—as constructed below—the structure is at least implied, and produces interesting insights for the present study. In particular, each of the keys of situation stray from what is normal as a means to mark their sections as abnormal using a variety of methods, all found in the following discussion.

Figure 2.5. *Don Giovanni's* grand tonal plan

Principal keys:

D minor – The tragic death of the Commendatore and the fate of damnation for the Don

D major – The status and cunning of the defiant Don

Keys of association:

F major – Often assigned to the low-born characters, but especially Leporello

B \flat major – Often assigned to the high-born characters

E \flat major – Elvira's principal key

Keys of situation:

C major – Used in the Act 1 finale for the Don's party, as was typical for brilliant or gala topics

A major – Used twice, both times for scenarios of amorous persuasion

F minor – Used only once, when the Commendatore dies in the opening duel

E major – Used only once, when the Commendatore reappears upon Leporello's invitation

B \flat minor – Used only once, when the Don refuses the Commendatore's final offer to repent

At first glance, C major as a key of situation in the Act 1 finale seems quite puzzling, as C was historically viewed as the most common and ordinary key, with its natural and pleasant sound. The belief in key characteristics has been variously attributed to many factors: the tuning systems of unequal temperament, the limitations of historical instruments, the natural resonance of various instruments, and so on. Claims often center on unequal temperament, as keys closer to C (fewer accidentals) were rendered more in-tune and “natural” compared to those further from C (more accidentals); and this, combined with instrumentation factors, may have contributed to the related belief in key characteristics, where each key was thought to evoke specific affects. But this account, as argued by Rita Steblin and discussed at greater length in the “tonal planning”

section of the present study, is grossly simplified and uncertain.¹⁶⁶ Whatever the causes, it remains that the belief in key characteristics was widespread; and for the purposes of the present discussion, only the general, historical understanding that more accidentals produced more deviations, or abnormality, is necessary.

Returning to the Act 1 finale, which depicts the Don's gala, the atmosphere of a grand party seems perfectly suited for the pure tones of C major, and so the choice is outwardly conventional on a local scale. But in the context of the whole opera, C is not a principal key, and thus foreshadows the fact that the finale will culminate in failure, or at least, not in complete resolution. Ratner observes the subverted use of the key, stating "the C major hurly-burly at the end of the finale, when the Don is being pursued after the attack on Zerlina, tells us that all the action will come to naught, since the significant keys for the Don are D major and D minor."¹⁶⁷ In short, C major is used *unconventionally* on the macro scale to denote failure, even while it is used *conventionally* on the local scale to denote a party.

Just like C major, the abnormality of A major as a key of situation lies not in the key itself, but in its manner of use. Each act has only one number set in A major, and both instances contain amorous persuasion: "Là ci darem" in Act 1 and "Ah taci" in Act 2. With similar situations and identical keys, the two numbers are thus paired at the macro level. Whether listeners without perfect pitch could actually perceive such a long-range connection is uncertain, but the pairing is obvious to even a cursory score analysis, and potentially noticeable by performers as well. It should also be noted that the relative scarcity of A on a structural level seems to preclude any notion that the macro structure of the opera is related to instrumental or

¹⁶⁶ Rita Steblin, "Key Characteristics in the Eighteenth and Early Nineteenth Centuries: A Historical Approach" (PhD diss., The University of Illinois at Urbana-Champaign, 1981).

¹⁶⁷ Ratner, 399.

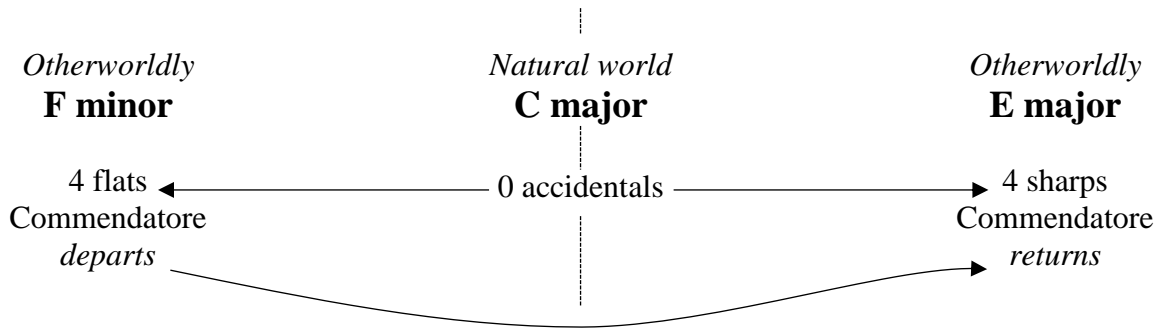
sonata forms. As the dominant of the opera's supposed key of D, one would expect A to occur much more frequently, and certainly not as a key of situation. A possible explanation for this can be found later in the present section, in the discussion on Leporello and his association with F major; but in short, F major may act as the "surrogate" principal key during the bulk of the opera, just as Leporello is the scapegoat for the Don and his key of D.

The three remaining keys of situation—F minor, E major, and B \flat minor—are abnormal by virtue of accidentals alone. As aforementioned, the combination of historical instruments and the system of mean-tone tuning would have rendered the remoteness of these keys more distinctly audible. This is made more salient by the fact that each key is used only once, and only to depict relatively fleeting moments connected to the *ombra*, or supernatural aspects of the Commendatore. Specifically, F minor is used at the death of the Commendatore, E major when Leporello later invites him back to dinner, and B \flat minor when the Don at last refuses him. Since the Don's fate is related to the death of the Commendatore, as well as to his own refusal to repent upon the Commendatore's return, it is fitting that these otherworldly moments would be scored with many accidentals. Furthermore, Ratner points out a fascinating pairing between the F minor and E major moments, in that they are diametrically opposed with regards to accidentals.¹⁶⁸

Figure 2.6 has been constructed below to better depict this pairing. The present study puts forth that four flats in a minor key indicates a descent from life into death, while four sharps in a major key indicates an elevated, or heavenly spirit returning to earth; ultimately implying that the Commendatore's judgement is representational of the divine. While only an explicit indication by Mozart could confirm the relationship as intentional, the connection at least seems plausible, especially when F minor's typical association with the grave is taken into account.

¹⁶⁸ Ratner, 399.

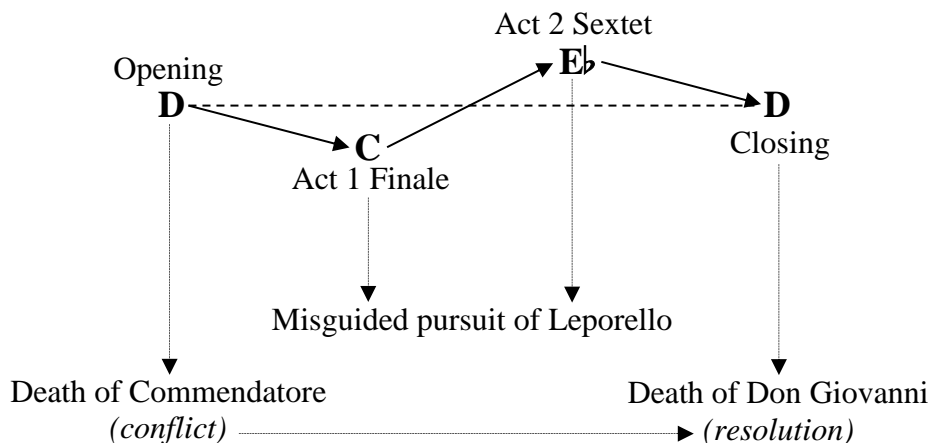
Figure 2.6. Tonality and the Commendatore



Aside from the particular use of tonalities, the basic tonal structure of *Don Giovanni* can be described by connecting the tonalities of the main “scene complexes.”¹⁶⁹ Within each of these sections, multiple numbers are grouped together to create a unit which Ratner regards as akin to an instrumental movement; but that which is also coordinated with continuous dramatic action. In short, these are critical moments both musically and dramatically, and Ratner finds four such scene complexes which act as pillars within the opera: the first and last complexes in D minor, the Act 1 finale in C major, and the Act 2 sextet in E \flat major. The two, inner complexes are in “off-center keys” which envelop D, as if on a truly grand scale of voice leading. And while the outer complexes in D minor both establish and seal the Don’s fate of damnation, the inner complexes “fail” in that goal, with characters erroneously and accidentally pursuing Leporello instead of the Don. To better visualize this arrangement, Figure 2.7 has been constructed below. Again, the significance of this structure is not being questioned presently, but Ratner’s bias for instrumental forms should be noted as an additional factor which will be seen to feature prominently in this section.

¹⁶⁹ Ratner, 399.

Figure 2.7. *Don Giovanni* tonal structure



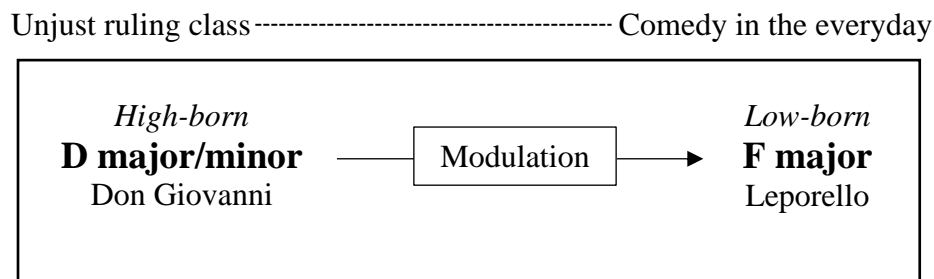
Disguised or mistaken identities are at the heart of comic opera, allowing servants and masters to trade places, and thereby create a subtext of social commentary veiled by amusement. Musically speaking, the volatile comic style and stalwart serious style could also be traded, so that characters would adopt traits of the opposite social status.¹⁷⁰ In cases of tonal planning, keys associated with certain characters could be a further tool for such a musical disguise. For example, when the Don impersonates Leporello in “Metà di voi” he assumes both Leporello’s comic figuration and his associated key of F major. The degree to which *Don Giovanni* incorporates change-of-identity (and likewise, status and style) is quite extensive, as evidenced by its designation as a *dramma giocoso*, which refers to a blend of the serious and comic styles.

But as previously discussed, the characters, events, and music of *opera buffa* also exhibited both serious and comic styles, such that these features were—perhaps to a lesser extent—familiar to audiences. So aside from pervasiveness, that which warranted the label of *dramma giocoso* and set *Don* apart from *opera buffa* can be seen in the juxtaposition of two

¹⁷⁰ Ratner, 399-401.

characters: the Don and Leporello. Through three separate occurrences—at the endings of the overture and finales—Mozart clearly emphasizes the shift in perspective from the high-born Don to the low-born Leporello by an analogous shift in tonality from D to F.¹⁷¹ In effect, this is a higher level of tonal planning, where instead of a single key being representative of something, a change between two keys (both representative in their own right) is now independently representative as well. Accordingly, the keys of D major/minor represent various aspects of the Don, and the key of F major represents Leporello, but the key change *between* the two represents a much broader concept, or one of the core themes of the opera: that the lower class is forced to take abuse on behalf of the ruling class; and that comedy must be found in the everyday until eternal judgement corrects such injustice. Figure 2.8 has been constructed below to better illustrate this relationship.

Figure 2.8. Tonality between the Don and Leporello



The relationship of the two keys is quite clear; the relative minor of F major is D minor. Since they share the same key signature, they are a perfect metaphor for the pairing of the Don (his immoral actions and eventual fate) and Leporello (the Don’s buffer and comedic foil). And as is commonly noted, the opera famously begins and ends in deeply dramatic scenes which strongly feature D minor juxtaposed by D major. This may lead one to believe that the

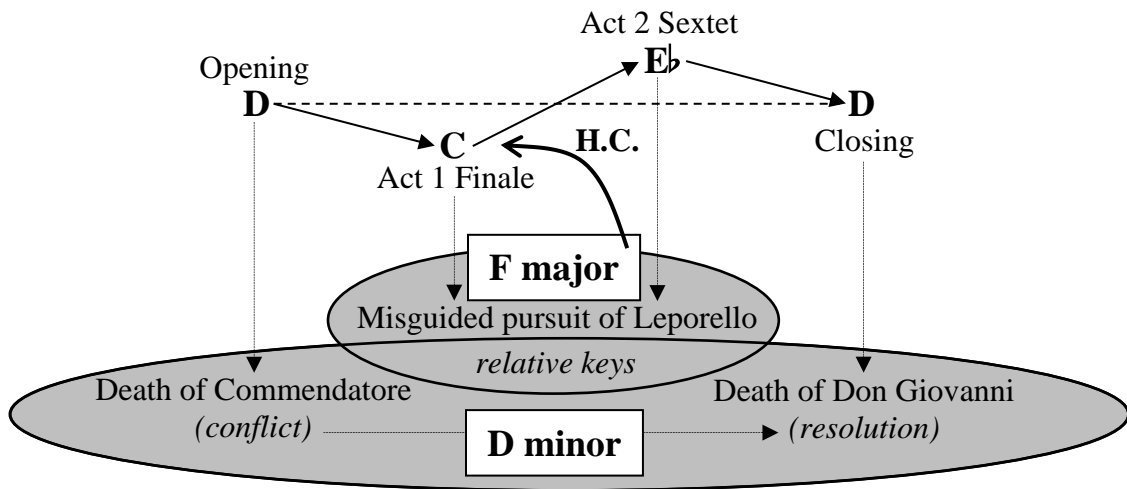
¹⁷¹ Ratner, 399.

importance of the key of D far outweighs that of F, seeing as D represents both the title character and the opera as a whole. But this can somewhat overshadow the fact that the intervening numbers—which comprise the vast majority of the opera—are outwardly light and comedic, and thus more suggestive of the character of Leporello and F major. Furthermore, for a vast majority of the opera, the Don escapes the serious consequences of his actions, instead forcing Leporello to cover for him and mistakenly bear the blame. The irony of Leporello is that even as he desires the benefits of noble status, he is made the surrogate for the Don's misdeeds. In short, he desires the pros but only gets the cons, and is made to be the punchline for many jokes which constitute the vast majority of *Don*'s runtime.

This study puts forth that just as Leporello is the substitute for the Don within the libretto, F major is the substitute for D within the score; and that even though D is the “true” key of the opera, F stands in as the principal key from the moment of the first D-to-F modulation until the last. Aside from explaining the opera's shift in focus to Leporello, and the largely comedic tone throughout, this arrangement explains two other idiosyncrasies of the opera: the lack of the dominant on a structural level (A major in relation to D); and the presence of the dominant of F on a structural level (C major in the first act finale). In this manner of thinking, Mozart would ostensibly be marking the first act finale with a half cadence, roughly indicating a midpoint in Leporello's role as substitute. Accordingly, the first D-F modulation would then introduce his role as substitute for the Don, and the last would terminate it, in a beginning-middle-end structure. These three moments are, more specifically: (1) when the overture does not close on D major, but the V of F, in order to prepare for Leporello's F major aria “Notte e giorno” (in which he expresses his desire for the Don's status); (2) when the Don accuses Leporello of seducing Zerlina in the Act 1 finale (the approach to D minor is diverted to F major); and (3) when the

Statue approaches the Don in the Act 2 finale, but the focus turns to Leporello's terror (again, the approach to D minor is diverted to F major). Ratner connects these diversions to the delayed fate of the Don, stating "a broad half cadence on A carries the import of fate; D minor is indicated, but once more F major intervenes."¹⁷² The surrogate, or substitute status of F major as the principal tonality can be seen in Figure 2.9 below, which overlays Figure 2.7 with both tonalities.

Figure 2.9. Two principal tonalities



Ratner points out that two of the four scene complexes within *Don Giovanni* clearly make use of concert music forms: the opening scene of Act 1 is like a grand four-movement symphony, and the finale of Act 1 is like a light divertimento.¹⁷³ Of course, the influence of instrumental music can be seen to a certain degree throughout the opera, but in these two instances the likeness of form is made especially clear, as can be seen in Figure 2.10 below.

¹⁷² Ratner, 401, 407, 410.

¹⁷³ Ratner, 400, 406.

Figure 2.10. Scene Complexes in the First Act

Act 1 Opening (four-movement symphony in D minor)

- ❖ First movement sonata form
 - Overture
 - Andante in D minor followed by Allegro in D major (i to I)
- ❖ Dance movement
 - “Notte e giorno” and “Non sperar”
 - Both small binary forms, march-like, F major (III)
- ❖ Slow movement
 - “Ah...soccorso” followed by recitative
 - F minor, D minor, modulatory (X)
- ❖ Finale
 - “Fuggi, crudele”
 - Allegro revenge duet, large-scale (i-III, X-i) in D minor (i)

Act 1 Finale (divertimento in C major)

- ❖ Contredanse
 - “Presto presto pria ch'ei venga” C major
- ❖ March
 - “Su svegliatevi” C major
- ❖ Slow minuet (followed by contredanse)
 - “Tra quest'arbori” F major
- ❖ Contredanse
 - “Bisogna aver coraggio” D minor
- ❖ Minuet
 - “Signor, guardate” F major
- ❖ Adagio aria
 - “Protegga il giusto cielo” B \flat major
- ❖ Gigue
 - “Riposate, vezzose ragazze” E \flat major
- ❖ March
 - “Venite pur avanti” C major
- ❖ Minuet (layered subsequently with contredanse and gigue)
 - “Da bravi, via ballate!” G major
 - Multiple ensembles beginning with “Eh balla amico mio!”
- ❖ Final ensemble
 - “Soccorriamo l'innocente!”; “Ecco il birbo”; and “Trema, trema” C major

The difference in character between the opening and closing of Act 1 is substantial.

While the opening marks the “beginning of the end” for the Don—showcasing the death of the Commendatore in D minor—the first act finale does not deliver the Don’s fate, containing a gala

and mistaken pursuit of Leporello in the off-center key of C major. Mozart's use of tonal planning reinforces the plot, but he also uses musical forms, and their conventional associations, to further clarify events. For instance, the symphonic form was increasingly seen as grand, and dramatic concert music, while the divertimento had a long history as light, after-dinner entertainment. Accordingly, Mozart denotes serious importance in the opening by using symphonic form in the opera's principal key of D, while also heightening the grave aspect through the use of the minor mode. While in the closing, Mozart communicates frivolous and trivial action through the use of divertimento form in the remote key of C major.

As to why the second act scene complexes (the sextet and finale) do not exhibit clear forms, while the first act complexes plainly do, remains uncertain. Waldoff observes that the whole trajectory of the second act is pointed toward supernatural confrontation, or "from the powers of human morality and law to the omnipotent power of a divine order which will triumph over the flesh even where it cannot over the spirit."¹⁷⁴ If the first act culminates in human confrontation at the gala, then perhaps the Act 1 complexes are likewise in "human" instrumental forms, while the Act 2 complexes are in "divine" forms—and thus, opaque or indiscernible. The second act's sextet is primarily organized around the successive addition of vocal parts, while the finale alludes to all three prior complexes in a sprawling form which thus assumes slight symphonic and divertimento aspects. It is possible that Mozart sacrificed clear form for the numerous demands of plot and large vocal ensembles—but given his considerable skillset, the discrepancy could just as likely been intentional. The deliberate use of more ambiguous forms, for instance, could (aside from the aforementioned manifestation of the divine) also represent the mounting uncertainty of the plot through the dissolution of clear, formal bounds. Although

¹⁷⁴ Waldoff, 188.

determining *why* Mozart used instrumental forms for the Act 1 complexes alone is limited to conjecture, it remains clear that *what* the forms create is a contrast (instrumental vs. operatic, clear vs. opaque, etc.) between the acts.

Aside from comparing the complexes, considering them separately yields two important discussions: the repeated structural harmony which occurs in the Act 1 opening, and the mixture of social class which occurs in the layered dances of the Act 1 finale. The layout of the opening can be seen above in Figure 2.10. Organized like a four-movement symphony in D minor, the tonality of each “movement” is as follows: i, III, X, i. This same tonal layout is repeated (or nested) at a lower level within its final section, the duet “Fuggi crudele”: i-III, X-i. The reiterated harmonic structure may initially seem to imply that the final section reflects on the events of the entire opening, but this is not true in a literal sense. The duet contains but a straightforward vow of revenge shared by the engaged couple of Anna and Ottavio; and though this is certainly a consequence of the preceding events, it is not a restatement, or summarization of them. Ratner observes that the forestalled cadence in D minor at the close of the overture is finally delivered by the duet; signaling both the end of the opening section, and “recalling the high style of Handel and Gluck.”¹⁷⁵ While Ratner fails to note the nested harmonic structure, it stands to reason that Mozart both delayed the cadence and repeated the harmony in order to emphasize the end of the opening section. This sets the opening apart from subsequent material, and works to delineate it as an independent, symphonic unit.

Within the Act 1 finale, Mozart confronts the high and low styles in a truly remarkable manner—through the simultaneous use of multiple dance styles and their respective time signatures.¹⁷⁶ This occurs, as is marked above in Figure 2.10, partway through the penultimate

¹⁷⁵ Ratner, 400.

¹⁷⁶ Ratner, 407.

section in G major (the minuet “Da bravi, via ballate!”) beginning with Leporello’s line, “Eh balla amico mio!”¹⁷⁷ The low contredanse in $\frac{2}{4}$, middle gigue in $\frac{3}{8}$, and high minuet in $\frac{3}{4}$ are all superimposed by three separate ensembles. Though justly notable and impressive in a musical sense alone, the metaphorical significance of such a mélange could not have been lost on contemporary audiences. Familiarity with each of the styles and the disparate settings with which they were associated would have been common knowledge, or at least assumed. Especially in an opera so permeated with social commentary, the mixture may have carried negative connotations insofar as it “tainted” the high style with lower ones. But regardless of its potentially offensive content, the depiction of each social class dancing together—both on the stage and in the music—implies something of the universal; and so, when the Don is discovered, it is not by one, but by humanity itself.¹⁷⁸

To a certain degree though, this mixture of styles can be found throughout Mozart’s catalogue, and especially within *Don*. What sets the simultaneous dances of “Da bravi, via ballate!” apart is the brazen explicitness of the layering—dulled only by the comedic packaging with which Mozart uses to insulate his most subversive social commentary. Just as the characters and music become their most deceived and inconsequential, the subtext ascends to its most poignant and acerbic. The audience looks on through the lens of a gala as the Don’s crimes again go unanswered, the injustices of the ruling class persist, and the plans of mere mortals fail to come to fruition. The common conception exhibited by Ratner and still existing today, that the Act 1 finale is an ultimately trivial divertimento, speaks to the depth of Mozart’s deception. This finale is certainly not inconsequential, for the Don assaults Zerlina (attempts rape) while the music dances on; and the greatest tragedy is that the audience is forced to look on such injustice

¹⁷⁷ W.A. Mozart, *Don Giovanni*, II/5/17:221.

¹⁷⁸ Waldoff, 191.

through the lens of comedy—just as powerless to intervene against the ruling class as they are in real-life.

If the Act 1 finale is human law, then the Act 2 finale is divine law. Justice is only delivered at the end of the opera through supernatural intervention, and so the intervening vows of revenge are but mere folly; the pride of man eclipses his incapacity. Nowhere else in the opera are these themes made clearer, except perhaps briefly in the epilogue, which many perceive as anomalous, “as though it were a morality play with the homily that evil ends badly...what can man do but laugh as he looks down upon tragedy?”¹⁷⁹ And though Ratner concludes that this indicates that comedy triumphs over tragedy in the end, the understanding that the Act 1 finale actually connects to the epilogue lends it a more ambiguous, and robust meaning. There is a futility in pursuing things outside of mortal bounds—justice is not delivered by human hands—but humor can be medicine until divine justice arrives. That is, humor is not necessarily victorious, but rather available and appropriate. In her exhaustive study on the music of recognition, Waldoff sees the final confrontation by the ghost of the Commendatore as a scene of recognition, where the Don has the opportunity for self-recognition, which he again rejects.

The opera culminates—as most dramas do—in a moment of climactic recognition...But while recognition usually brings resolution, here it brings the opposite: in *Don Giovanni*, recognition—and its denial—deepen the conflict already inherent in the work.¹⁸⁰

The duality of the endings, one for the main character and another for everyone else are both linked and undermined by the Don’s denial of recognition. Thus, the *lieto fine* conclusion is not detached and straightforward, but entwined and ambiguous; and it suits the *dramma giocoso* designation perfectly—neither comedy nor tragedy has prevailed.

¹⁷⁹ Ratner, 411.

¹⁸⁰ Waldoff, 199.

CHAPTER 3: MUSIC THEORY AT THE MACRO SCALE

Tonal Planning

Before entering forthright into a discussion on tonal planning—that is, the intentional or symbolic arrangement of keys within a composition—a related and somewhat more divisive topic must be addressed; namely, the topic of *key characteristics*. Long has the notion that each key represents certain affects been debated, but the history of how that debate originated and changed through the years was left largely untreated until a seminal dissertation by Rita Steblin addressed the matter directly.¹⁸¹

In her exhaustive chronological study on the debate and immense historical interest surrounding key characteristics, Steblin avoids proposing a cause, and instead shows how the controversy actually produced some unified conclusions around the flat-sharp principle. First, Steblin dismisses the common misconception that key characteristics originated from the Baroque “doctrine of affections” by showing that the practice predated the Baroque significantly, and could be seen at least as far back as the Greek doctrine of ethos.¹⁸² The transition from modality to tonality increased the significance of key greatly, but it was in the eighteenth-century transition of tuning, from unequal to equal temperament, that arguments truly intensified.¹⁸³ If unequal temperament gave rise to the individual character of each key by making keys more distal to C less accurately in-tune—and thus, less natural, or “pure”—then the transition to equal temperament would destroy key characteristics entirely. This initially forced theorists to take sides depending on which tuning they favored, but later, once equal temperament gained

¹⁸¹ Rita Steblin, “Key Characteristics in the Eighteenth and Early Nineteenth Centuries: A Historical Approach” (PhD diss., The University of Illinois at Urbana-Champaign, 1981).

¹⁸² Steblin, 21.

¹⁸³ Steblin, 243-244.

supremacy by the early nineteenth century, the proponents of key characteristics were forced to find new causes other than tuning.

A widespread explanation in the early nineteenth century, and one which still exists presently, holds that the greater ability to use open strings in sharp keys lends those keys additional brilliance or resonance. But this theory was significantly undercut even by 1830, given that if the physical properties of instruments are to be fully accounted for, then the greater resonance of many wind instruments in flat keys would produce a counteracting effect. Regardless of the purported causes and effects, Steblin finds a striking consistency which may best be understood as a psychological or associative phenomena; specifically, that flat keys symbolized a lowering or depression of mood, while sharp keys symbolized a raising or elevation of mood.¹⁸⁴ The flat-sharp principle (which is synonymous to directionality around the circle of fifths) became an important unifying force, even a convention with an assumed truth, and one referenced through innumerable sources across the centuries. Aside from flat-sharp associations, others were more practical; the connotations of C and D major as martial keys, for instance, can be traced to the common use of trumpet in military music, as the instrument was historically limited in its tuning to those same keys.¹⁸⁵ Steblin views the flat-sharp convention as ubiquitous but not wholly-binding, as the demands of tonal plans or instrumentation could easily override it—and as with all conventions—the opportunity to deviate or subvert norms became a symbolic possibility as well. Although key characteristics may seem dubious or irrelevant in the modern context, Steblin makes a strong argument for their historical and analytical significance, especially along the lines of the flat-sharp principle. This is perhaps best exemplified in the closing lines of her dissertation:

¹⁸⁴ Steblin, 248-250.

¹⁸⁵ Steblin, 246.

The question whether or not there is or ever was a scientific foundation for key characteristics is immaterial. What is important is that so many musicians in the past believed they existed. We do know how certain composers and theorists conceived of keys, and the evidence for certain conventions regarding key affects in the late 18th and early 19th centuries is incontrovertible; this should add to our understanding of the music.¹⁸⁶

Steblin's lucid account of key characteristics allows the modern analyst to consider musical meaning through the lens of the composers, performers, and listeners of that time. The musical meaning associated with those key characteristics is too often unrecognized; and so, it forms a component which the present study will consider in combination with tonal planning.

To reiterate, this study involves the unified analysis of three operas in their entirety, and with such a macro perspective arises certain issues in music theory which are not normally encountered. Conventional music theory, especially with regards to functional tonality, operates initially at the local level, where individual notes form chords, themes, and phrases.

Extrapolating to higher levels of structure often involves the contrast or return of musical material; but also, there is the consideration of more global characteristics, such as key, tempo, texture, intensity, and so on. Ultimately, the process is a bottom-up approach, where more local characteristics concatenate and justify the placement of structural boundaries, leading eventually to overall musical form. This approach, which may be termed conventional or classical music analysis, is abundantly useful, but biased in the sense that it is myopic. While local characteristics—like harmonic progressions and voice leading—are treated rigorously with clear rules and concepts, macro characteristics are treated secondarily and with more ambiguity, often falling to the subjective judgement of the analyst.

Attempts to resolve this discrepancy found great currency in the twentieth century, with many theorists considering formal, or structural coherence; and perhaps the most famous among

¹⁸⁶ Steblin, 250.

these efforts were the competing theories of Schenker and Riemann. Schenkerian analysis continues to be a force in music theory, and even appears in Lerdahl and Jackendoff's generative theory of tonal music, discussed at length in the cognitive/perceptual section of this study. But Schenkerian analysis, as well as Riemannian analysis, is immensely complicated, open to interpretation, and not as yet aided by computational methods. Furthermore, the analysis of number opera suggests discrete units both in the numbers themselves as well as in each act, and a method which naturally suits such segmentation seems appropriate.

The music theory subfield of tonal planning, which describes the intentional and symbolic use of key, has long filled this role in operatic analysis. However, the prevailing need to prove greatness in art through the demonstration of unity—an affliction common to the twentieth century and arguably furthered by the formalist tendencies of Schenker and Riemann—led to a corresponding movement in tonal planning. In other words, tonal planning lent itself easily to circumstantial connections proving grand designs, and with the particular degeneracy of a pseudoscience, lumbered inconsequentially toward an inevitable demise. But tonal planning was saved from that mockery (although the cryptozoology of Mozart continues to intrigue) through monumental efforts at the end of the twentieth century by James Webster, John Platoff, Mary Hunter, and many others. In the following discussion, the astounding reappraisal of tonal planning can be observed, laying the foundations for studies—such as the present one—to consider it in a critical, and (hopefully) more objective manner.

* * *

James Webster argues that conventional analytical models—which are primarily based on instrumental and “absolute music”—create a skewed reading when uncritically applied to opera. This leads to the omission of aspects particular to dramatic staged vocal music, while also

privileging its intersection with instrumental aspects. For example, language prosody, character types, and social context may easily go overlooked while a supposed resemblance to sonata form may be emphasized. But aside from a mismatch of analysis and material, Webster sees a deeper and more problematic issue with conventional, instrumental analysis—the implication and valorization of *unity*:

The notion of artistic unity in the modern sense arose in the early nineteenth century as an aspect of Romantic aesthetics, based on organicism and evolutionism; it was thus linked with the rise of “absolute” instrumental music. Its analytical manifestations in theorists like Schenker, Schoenberg and R  ti have been much discussed recently. In operatic studies, this orientation flourished primarily in connection with Wagner.¹⁸⁷

In this manner, the twin shadows of Romantic opera and instrumental analysis not only obfuscate Mozart, but also reveal only that which they desire. Thus, Mozart’s ensembles and finales are emphasized over independent arias, since the former more closely resemble the through-composed and unified structures favored by Wagner, Verdi, and the aesthetic principles underpinning instrumental analysis as a whole. The details of Webster’s argument would be too lengthy to cover here, but what a great majority of it entails, is the deconstruction of arguments made in numerous contemporary sources, and the rejection of unity-based approaches which Webster sees as reductionist. With regards to tonal planning, Webster also remarks on the widespread tendency to make temporally distant relations, stating “it is downright dangerous to unite discrete numbers, separated not only by recitatives and action but often by intervening concerted numbers as well, in extreme cases even by the curtain and an interval, into large-scale ‘forms.’”¹⁸⁸

The insistence that tonal plans are like elongated progressions is further undermined by the tuning of historical instruments (trumpets and timpani were limited to C, D, and E \flat) which

¹⁸⁷ Webster, “Mozart’s Operas,” 200.

¹⁸⁸ Webster, “Mozart’s Operas,” 212.

essentially forced finales into those same keys.¹⁸⁹ Combined with the associative uses of key (A for love-duets, D for high-born sentiments, etc.) and other, utilitarian aspects, like the need to accommodate a particular vocal range; a grand and unified form by way of tonal planning seems not just implausible, but impossible. Webster is careful to point out that this does not preclude the connections of key to characters, situations, or key-relations in general, but that these features should not be assumed to constitute a form.

Throughout the study, Webster supports the analytical paradigm known as *multivalence* which holds that an opera entails separate domains (such as text, plot, staging, and music) that are flexibly coordinated; and furthermore, that the “resulting complexity or lack of integration is often a primary source of [an opera’s] aesthetic effect.”¹⁹⁰ In a multivalent analysis of an opera, the various domains are considered together, but not evaluated in terms of unity. That is, there is no “ideal” for the music and text to be in agreement with one another, as the domains may at times align, support, or even contradict each other. Webster notes that such a holistic perspective can be unfocused and “genuinely imposing” but that it is the only way toward finding true musical meaning.¹⁹¹

The present research accepts Webster’s charge for multivalent analysis, and even utilizes it as a core linking principle throughout the study. Given the hypothetical task of translating Mozart’s Da Ponte operas into a different style, one must preserve fundamental meaning; and so, must first find where meaning resides, how it is expressed, and what its contents may be. In an abstract sense, any analysis which seeks understanding is necessarily a pursuit of some meaning as well, but for the purposes of musical translation, the identification of fundamental meaning

¹⁸⁹ Webster, “Mozart’s Operas,” 216-218.

¹⁹⁰ Webster, “Mozart’s Operas,” 198.

¹⁹¹ Webster, “Mozart’s Opera,” 202.

must be drawn from a fully-comprehensive view. This task is not assumed to be possible, nor is the correct locating or defining of meaning; however, it is through this hypothetical angle or thought experiment that an investigation of meaning-making can be engaged fruitfully, and multivalently. In music theory, tonal planning and listener-based analysis are considered; in psychology, perception and cognition are considered; in aesthetics, semiotics, syntax, and value are considered; and in musicology, social context and dramatic content are considered. Taken together, these various threads represent a multivalent analysis of musical meaning, centering on the Da Ponte operas in particular.

John Platoff builds off of Webster's rejection of unity as the supreme condition for aesthetic value, and introduces two additional considerations when determining the significance of high-level tonal plans: listener perception and composer intention. The persistent twentieth-century need to demonstrate the structural and meaningful significance of tonal plans in Mozart's music is summarized by Platoff as the belief that "if unity is closely linked with greatness, then Mozart's operas, being great, must be unified."¹⁹² But without unity as a determinant of value, there emerges the question of how to analyze tonal plans, and what produces significance.

For Platoff, perceptibility and intentionality are the successors to unity; they allow the analyst to determine whether a tonal relationship is significant to the audience (it is perceptible), to the composer (it is intentional), both (perceptible and intentional), or neither (imperceptible and unintentional).¹⁹³ The first factor, perception, is complex in the sense that listener perception is not entirely scientifically understood, highly variable amongst individuals, and subject to numerous interfering factors such as inattention and mood. Additionally, Platoff joins Webster in questioning if a high-level tonal plan could even be perceived as a "progression"—given that this

¹⁹² Platoff, "Myths and Realities," 4.

¹⁹³ Platoff, "Myths and Realities," 7.

implies listeners are capable of hearing an entire number in the dominant, for example, despite that same key existing as the tonic within the confines of the number itself. In short, perceiving two different harmonic functions simultaneously seems doubtful.

The uncertain nature of perception thus renders it inappropriate as a basis for claims of significance; and so, it is in the second factor—intentionality—that Platoff finds his way forward. Even assuming a particular tonal relationship is imperceptible, intentionality allows significance to persist in terms of the composer. Demonstrating that a choice is intentional becomes a matter of separating the conventional from the particular; and by cataloging Mozart's entire operatic oeuvre, along with twenty-eight contemporaneous, comedic operas, Platoff creates a massive statistical sample of key choice.¹⁹⁴ From this sample, he is able to make three clear observations which differentiate Mozart's work from that of his peers: first, Mozart always begins and ends operas in the same key, with intervening finales occurring in other keys; second, the tonic key of each finale is avoided in the two or three numbers immediately preceding it; and third, multiple arias given to the same character are most often in different keys.¹⁹⁵

Just as Webster does not eliminate tonal planning altogether, Platoff calls for a higher standard of proof, stating “while a degree of tonal planning can be found, its contribution to the organisation of a Mozart opera is both more limited and more difficult to evaluate than has been acknowledged in the past.”¹⁹⁶ Tonal plans may very well connect to the plot, but conventional key associations and instrumental limitations cannot be overlooked. Furthermore, listener perception should not be assumed to correspond directly with analytical observations, and should be accounted for within analysis. For example, tonal relations between adjacent numbers may be

¹⁹⁴ Platoff, “Myths and Realities,” 8.

¹⁹⁵ Platoff, “Myths and Realities,” 10.

¹⁹⁶ Platoff, “Myths and Realities,” 3.

more perceptible than temporally distant ones, and so should be prioritized in analysis—a point which Platoff argues throughout the work. The present study is informed greatly by the stances of Webster, Platoff, and the wave of writings which course-corrected tonal planning ahead of the twenty-first century. As such, this study is multivalent in the sense that it accounts for various modes of meaning (music, plot, social context, psychology and so forth) while also resisting the siren call of unity and value-judgements in general. It should be noted that Platoff's argument implies that to be imperceptible and unintentional is also to be insignificant, or perhaps significant only to the analyst. This view is not shared by the present work, as it is an instance of the poietic fallacy, or the belief that artistic worth is ensured primarily by the act of creation.¹⁹⁷

* * *

If the previous two sources by Platoff and Webster lay the foundation for their stances (this is not to suggest that they are co-authors, or always in complete agreement) then the following two studies will reveal them in application. Remarkably, both go on to discuss finales in *Figaro*, with Platoff and Webster taking the second and fourth acts, respectively. This should be an immediately surprising choice given that the emphasis on ensembles and finales in scholarship was previously decried by both authors; but in another sense, this presents an ideal opportunity to dispel beliefs where they hold most ardently. It will be shown in both cases that with relatively simple considerations of plot and context, musical understanding is greatly aided. And even when tonal planning is inarguably present, the sole focus on such can lead to misconceptions in clear disagreement with the musical and dramatic surface.

¹⁹⁷ See the discussion on Richard Taruskin and Walter Horn within the “Psychology of Listening” section of the present study for a more detailed account of the poietic fallacy, and how perception and intention do not guarantee value.

The Act 2 finale of *Figaro*, as well as the act itself, begins and ends in the same key of E \flat . The finale is also unusually clear in terms of tonal movement, as it outlines the tonic triad and then descends by fifths until it returns to the tonic: E \flat – B \flat – G – C – F – B \flat – E \flat . This has naturally drawn a great deal of attention from analysts through the years, who hold such large-scale tonal coherence in high regard—even crediting it for the finale’s greatness.¹⁹⁸ Tacit to these discussions is the belief that harmonic closure, resemblance to instrumental forms, and unity are not just perceptible, but guarantors of greatness. Platoff is predictably in disagreement with such sentiments, and begins by cataloging the finales of two dozen comedic operas premiered in Vienna during the same decade as *Figaro*. This is done to enumerate the typical practices of the period, and to thereby ascertain the unique aspects within the Act 2 finale of *Figaro* itself.

Finales are like multi-movement forms with modulations throughout, but many of the modulations *within* each movement are considerably deemphasized; and accordingly, tonal motion between the end of one movement and the beginning of the next is often the only marked juxtaposition. Platoff differentiates in these instances between two types of tonal movement: near-key and distant-key.¹⁹⁹ Near-key movement accounts for most examples, and includes the continuation of a key, movement up or down a fifth, and movement to the relative or parallel keys. Distant-key movement draws more attention to itself, and includes movement up or down a major or minor third, and movement up a semitone. The intervals not accounted for by either of these categories, such as the major second and tritone, had no occurrences within Platoff’s sample.

The differentiation of tonal motion into just two types allows Platoff to make a remarkable observation; namely, that distant-key movement is used sparingly, and most often to

¹⁹⁸ Platoff, “Tonal Organization,” 387-389.

¹⁹⁹ Platoff, “Tonal Organization,” 390.

mark a corresponding dramatic shift. This may be the shift from one subplot to the next, a startling revelation, a change of scene, entrances or exits of characters, and so on. Through the course of the study, Platoff also shows how both Mozart and his contemporaries frequently created “tonal regions” connected by a series of near-key moves to closely-related keys, and separated by distant-key moves.²⁰⁰ The use of distant-key shifts to articulate new dramatic segments has gone on to be a highly influential concept—support for which can be found in Charles Rosen’s later writings,²⁰¹ and also in the discussion below on Webster’s analysis of Act 4. However, this does not imply that tonal motion can be observed apart from other features—as discontinuities in texture, orchestration, dynamics and so on can also serve to divide passages according to dramatic content. In this sense, structural and dramatic delineation can be understood as not under the purview of any single musical feature.

Platoff works through the finale, continuously showing how the structure of the drama provides a more accurate starting point to analysis than tonal plans or instrumental forms. Since the events of the drama are continuously articulated by various musical features, the approach may be considered locally- and dramatically-based, and it allows for more flexibility in terms of analysis. For example, the single distant-key shift in the finale (the shift to G at the start of the fourth movement) is also the point of furthest harmonic remove relative to the tonic. In terms of tonal plans alone, this would indicate that the movement in G should have a corresponding degree of dramatic tension or emphasis—but this is not the case. If one begins from the drama however, this common pitfall can be avoided, as the tonal shift simply marks Figaro’s entrance and begins the second wave of dramatic action without being heightened by changes in other

²⁰⁰ Platoff, “Tonal Organization,” 392-393.

²⁰¹ Charles Rosen, “Dramatic and Tonal Logic in Mozart’s Operas,” in *Freedom and the Arts* (Cambridge, MA: Harvard University Press, 2012).

musical features. Platoff concludes that the atypical degree of tonal coherence in the finale could stem from Mozart's recent preoccupation with instrumental music, or a desire to create continuity in a finale otherwise marked by extreme imbroglia and near-constant dramatic incidents. But regardless of Mozart's intentions, Platoff continuously points to the expressive surface of the music more so than any macro consideration, stating "the felicities of the musical realization are frequently local, foreground events."²⁰²

James Webster's analysis of the Act 4 finale of *Figaro* shares much in common with Platoff's analysis (of the Act 2 finale) in the sense that both studies treat opera as multivalent and contextual. To reiterate, multivalence stems from the argument that conventional analysis is fundamentally suited for instrumental music, and that operatic analysis should necessarily be idiomatic—so as to better account for additional domains such as drama, text, social context, genre conventions, and so on. Webster also advocates for the analysis of larger spans of music, noting how most instrumental analyses only consider "individual movements (or much shorter passages), and have tended to ignore both the large-scale coherence of multi-movement works, and questions of interpretation or meaning."²⁰³

The significance of Webster's statement cannot be overlooked as part of his broader stance; specifically, the negotiation of the formal/contextual divide. While one may reasonably expect a contextual study to emphasize extra-musical considerations over intra-musical forms, the historic distinction need not be absolute, as Webster demonstrates. In fact, the methodology itself can be viewed as roughly analogous to the concept of multivalence, as Webster employs various approaches for each domain, with some approaches being formalist and others being contextual. Plot analysis, tonal planning, and even Schenkerian analysis investigate the work

²⁰² Platoff, "Tonal Organization," 403.

²⁰³ Webster, "The Act IV Finale," 91.

itself, while social context and genre conventions frame the discussion. Just as the domains are not required to be coordinated (e.g., music and text may be independent), so too are the methods understood to be flexible (e.g., genre conventions are contextual and Schenkerian analysis is formal). In short, Webster creates a multivalent methodology to suit a multivalent view of opera, and thereby allows his analysis to have both contextual and formal considerations.

What Platoff refers to as tonal regions, Webster refers to as segments, and while the two sometimes overlap, a segment is a more inclusive term reminiscent of Gestalt-based unit formation. A segment in terms of tonality could be synonymous to a tonal region, which is a series of closely-related keys marked at the beginning and end by shifts to remote keys. But a segment could also be of dramatic action, which would account for changes of scene, character entrances/exits, and set-pieces. Possible within any domain, a segment is simply what adjacent elements can be grouped together. Tonal planning in this sense becomes a correlation between the segments of tonality and the segments of a separate domain, such as dramatic action; and it is this very same correlation which Webster finds throughout the opera:

In *Figaro* there tends to be a correlation between the ‘segments’ of the action (the comings and goings of the characters and changes of scene) and the keys of the various set-pieces: within a given segment, the set-pieces tend to be in closely-related keys, whereas the relation between the last number in a given segment and the first number in the following one tends to be remote.²⁰⁴

Using Webster’s terminology, it seems plausible that segments existing within unexplored domains may also be correlated, whether that correlation may be between the new domains or to more conventional domains such as tonality, drama, and so on. These “unexplored domains” are—in the context of the present study—those found through computational analysis on audio, or feature extraction. The details of feature extraction can be found within the

²⁰⁴ Webster, “The Act IV Finale,” 99.

methodology section of this study, and so will not be covered presently. Likewise, the highly detailed and thorough nature of Webster's analysis presents too much material to adequately cover here, but some significant points, especially in terms of tonal planning, will be discussed.

Webster's argument for the correlation between dramatic and tonal segmentation is highly persuasive, with a figure showing how the two align frequently.²⁰⁵ It is remarkable to see the clarity and consistency of this connection: segments containing continued characters and dramatic action internally have near-key movement; while the beginning of a new segment, which contains a shift in characters or action, is marked with distant-key movement. Most often, near-key movement is by ascending or descending fifth, while distant-key movement is by third.

Webster's observations on formal types are quite insightful, as he consistently shows that form can seem clear when observing a single feature in isolation—say, tonality or meter—but that such clarity breaks down when multiple features are considered together.²⁰⁶ Furthermore, what superficially resembles a form may more accurately exhibit an A-B-A *construction* without necessarily creating a *form* such as ABA or ternary. For example, if tonality is solely considered in a finale, then the convention of beginning and ending in the same key inevitably makes an arch form the only basic possibility. But the movement from stability to instability and back, which arch form implies, is shown by Webster to be in gross disagreement with dramatic tensions; they are unresolved at the opening of the finale, requiring the strands of various subplots to peak and resolve at different times, and without regard for any ostensible tonal form. To say the forms of drama are dissimilar to those of music may be a simple observation, but it uncovers the question of what, in fact, articulates the drama—or indeed, if anything at all. For Webster, the answer is context-dependent and determined by whichever feature “corresponds

²⁰⁵ Webster, “The Act IV Finale,” 100-102.

²⁰⁶ Webster, “The Act IV Finale,” 102-107.

more strongly with the distinctions among the foregrounded characters and the segmentation in the dramatic action.”²⁰⁷ Again, and as with Platoff, this is an approach which may be viewed as dramatically sensitive, or even dramatically based.

Webster and Platoff in combination—Webster’s multivalent approach and macro perspective, along with Platoff’s emphasis of perceptibility, conventions, local juxtapositions, and tonal regions—is highly informative to the current work. Through Webster, this study accounts for the various domains of opera while also taking a heightened macro perspective across the three Da Ponte operas. Through Platoff, this study views tonal planning critically while also considering the cognitive aspects of perception. And though the following point will emerge more through the discussion on aesthetics and musical meaning in general, Webster regards his own analysis as but a single reading, stating “the reading offered here, whatever its limitations (every reading has limitations), is more inclusive than most others in current discourse.”²⁰⁸ Regardless of how Mozart’s operas are approached, the angle of analysis imprints itself upon the results, rendering musical meaning fluid and infinite. In this respect, the current study is but one reading adrift an unfathomable sea of endless meaning.

* * *

Taken by itself, the preceding discussion on Webster and Platoff may imply a consensus in tonal planning, or that a revisionist spirit has completely saturated the field. But the pairing of unity and greatness continues to attract modern scholarship, and can be observed, for instance, in Edward Green’s study on tonal symmetry in Beethoven’s *Leonore* (the manuscript versions of

²⁰⁷ Webster, “The Act IV Finale,” 104.

²⁰⁸ Webster, “The Act IV Finale,” 127.

Fidelio).²⁰⁹ Green argues that Beethoven deliberately used tonal symmetry around the pitch C—both in terms of interval and time—to symbolize dramatic themes and characters within his opera. For example, A \flat and E (both are major third juxtapositions from C) denote the opera’s leading couple, C represents their hopeful reunion, while B \flat and D (major second juxtapositions) represent antagonists to that goal.²¹⁰ The antagonistic characters, who are quite literally preventing the union of the couple, are represented by keys closer to C than the couple; thus, symbolizing their interference. Green endeavors to find symmetry not only in tonal relations, but also temporally around the axis of C, and goes on to find these connections at virtually every level of *Leonore*’s construction.

It is tempting to dismiss Green outright, whose formalist arguments for symmetry often require inversions, retrograde, and transpositions across huge temporal distances; and even more so, since such symmetry is based on pitch relations as opposed to the closeness of keys according to the circle of fifths. This is compounded by the pervasive valorization of unity, symmetry, and form as the highest pinnacles in art. But however dated these beliefs may appear, they likewise carried great significance historically, and Beethoven himself may likely (if not certainly) have been attracted to the possibilities of unity, symmetry, and grand design available through macro tonal plans. In a historical context, even faulty logic which is widely believed is—at least relatively speaking—true. A shiny, new methodology may in some sense be incongruous to the study of dusty materials and cobwebbed beliefs.

While many studies can thus be saved from the rocky shoals of grand design, others run aground by engaging in a sort of reverse chronology, where those traits cherished by the

²⁰⁹ Edward Green, “Tonal Symmetry in Leonore: An Instance of an Enduring Principle in Beethoven’s Compositional Method,” *International Review of the Aesthetics and Sociology of Music* 46, no. 2 (December 2015): 291-320.

²¹⁰ Green, 302.

Romantics are accentuated and found nascently in the classical era. This is not to say that the classical did not influence the Romantic—as has been frequently noted, the works of Mozart powerfully impacted Beethoven throughout his career.²¹¹ But it is fundamentally different to assert that Mozart’s music gains value for prefiguring Romantic sentiments; and by also aligning more neatly with the tenets of conventional music theory. If a different era had followed the classic, for instance, or if Mozart’s music garnered less reception and subsequent influence, or if conventional theory could not explain Mozart’s music, then would this correspond to a drop in value? That is, does value lie in the object, the beholder, some combination of the two, or elsewhere altogether? The present study does not attempt to answer such aesthetic questions, but simply points out that to valorize the Romantic traits of Mozart is to tacitly place an argument on such shaky ground.

It is informative to see how the specter of Beethoven travels backward through time to animate the analysis of previous works. Green observes in Mozart’s *Figaro* a sequence of seven keys which is later reversed; he also observes in the Fantasy movement of Haydn’s *String Quartet, Op. 76 #6* a sequence of five keys which is symmetrical, with inversion, about the middle key.²¹² While both observations are true in a general sense, they require some dubious concessions: the reversed sequence of keys in *Figaro* begins amidst the finale of Act 2 and continues through Act 3, while also adding a tonality (Number twenty in C) which is not present in the first sequence; and the sequence of “five” keys in the Haydn is actually nine keys which is reduced to five by describing two separate groups of keys as harmonic prolongations, (for example, B – E – B is reduced to B). For the Mozart and Haydn examples, there is no indication

²¹¹ For a thorough discussion on Mozart’s influence throughout Beethoven’s life, see: Jeremy Ryan Briggs Roberts, “The Influence of Wolfgang Amadeus Mozart on the Creative Life and Output of Ludwig van Beethoven: A Cross-Genre Investigation” (DMA diss., University of Washington, 2004).

²¹² Green, 311-312.

that these reversible structures have any correlation with other musical or dramatic parameters, as was argued for *Leonore*. But the plausibility of that argument in connection with Beethoven lends a suggestive tone to the analysis of Mozart and Haydn. Furthermore, the reader is left to question if these structures are the result of coincidence or intention, if they affect the listener directly, indirectly, or not at all, and more generally, if they hold significance in the work aside from their own existence.

To revive a line of previous thought about what this discussion implies—or more directly, what the stance of the present study entails—it is not to hold new, contextual approaches in a more favorable light than old, formalist ones; but to support Webster’s multivalent approach as a means of acknowledging the merits in both. Webster himself even points to Carl Schachter’s analysis of a recitative and aria in *Don* as an exemplary model of the formalist approach,²¹³ but it is amusing to note that Schachter begins that very same analysis by diminishing the opposition to unity, referring to it as “the currently fashionable rejection of musical unity as an analytic presumption, especially in the criticism of opera.”²¹⁴ Schachter’s comment seems to be a misinterpretation that the critique of unity is against its very existence, not—at least with regards to Webster—that it is unrelated to aesthetic worth. In the interest of balance, two intramusical analyses on tonal planning will be considered below; the first being Martin Mueller’s (not formalist) analysis on *Idomeneo*, and the second being the aforementioned study by Schachter. Additionally, this discussion hopes to deconstruct the assumption that an intramusical perspective is necessarily formalist as well.

²¹³ Webster, “The Act IV Finale,” 91.

²¹⁴ Carl Schachter, “The Adventures of an F#: Tonal Narration and Exhortation in Donna Anna's First-Act Recitative and Aria,” *Theory and Practice* 16 (1991): 5.

From ancient Greek tragedy to a hugely popular eighteenth-century book, Mueller begins his study by tracing the story of Idomeneus diachronically, or as it changed through time. This is by no means a cursory introduction, as Mueller devotes over half the analysis to what may be viewed not so much as contextual, but *intertextual* considerations. In many operatic studies, and especially intramusical ones, the story behind the libretto is reduced to a footnote—if mentioned at all. Significantly, the sensitivity with which Mueller treats the story allows his tonal plans to be tied to broader, more abstract principles of the story, and not just to local and superficial events. This is epitomized by Mueller’s observation on the opera as a whole: “The basic narrative question of the Idomeneo is: ‘Will Idamante be sacrificed?’ The musical version of this question is: ‘Will the music get out of d-minor?’”²¹⁵

Establishing his view on tonal plans, Mueller first discusses basic harmony in some intriguing ways which inform and support the present study. Specifically, the feature extraction in this study places time on the x-axis and key on the y-axis, producing a graph of tonality. Viewing tonality in this manner is supported by Mueller, as he unfolds the circle of fifths such that it exists on a hierarchical binary; thus, moving upward, or sharper, is a raising of tension while moving downward, or flatter, is a lowering of tension.²¹⁶ Furthermore, the sharp/flat binary is homologous to major/minor; or more specifically, motion to the parallel minor is three keys flatter, and motion to the relative minor—though the key remains unchanged—moves the tonic pitch downward by minor third. Mueller also notes that only major keys are fully stable, and that the whole system of raising and lowering, whether that be in key or modality, creates a rhetoric of progression and regression perfectly-suited for an opera’s narrative.

²¹⁵ Mueller, 38.

²¹⁶ Mueller, 40-41.

As has been noted throughout the discussion on tonal planning, another determinant of key was the historical convention of key associations—the belief in which was widespread but inconsistent. While the potential incompatibilities of functional tonality, tonal planning, and key associations are not discussed by Mueller, he argues that Mozart’s system “is a personally inflected version of conventional practices, is quite firmly articulated in *Idomeneo*, and does not change thereafter.”²¹⁷ As an important precedent to the Da Ponte operas covered by this study, Mozart’s particular system of key associations, as described by Mueller, is included below:

Figure 3.1. Mozart’s key associations, as designated by Mueller²¹⁸

1. D major is the key of human power and of good government that loves a parade
2. D minor is the key of revenge or of human power gone wrong
3. G major is the key of natural man
4. G minor is the key of human grief
5. B \flat major is the key of enlightened humanity
6. A major is a lovers' key
7. A minor is reserved for exotic occasions
8. E major is the key of deceptive appearances
9. E \flat major and C minor are third-person or cosmic keys
10. C major and F major are switching keys with no special character

What follows in Mueller’s analysis is a tremendously thorough account of both plot and tonality across the entirety of *Idomeneo*, with Mueller showing how the two are correlated. The analysis resists the urge to formalize or make value assessments, instead showing how key associations and tonal relations coordinate with dramatic events. Additionally, more abstract themes—such as the D minor aggression of Idomeneus which eventually yields to the E \flat major pacifism of his son, Idamante—is shown to occur on both local and macro levels throughout the opera. But aside from the general precedents which *Idomeneo* set, the details themselves may

²¹⁷ Mueller, 42.

²¹⁸ Mueller, 42.

initially seem irrelevant to the Da Ponte operas in particular; however, it is only through Mueller's intertextual analysis that a connection to Donna Anna in *Don Giovanni* can be made.

Mueller argues that Donna Anna is the fully-realized version of Electra, who—for reasons related to the diachrony of the Idomeneus story—was reduced from what was once Sophocles' noble avenger, to simply a “woman scorned” and essentially passive. In other words, the Electra of Mozart's *Idomeneo* is in name alone. Conversely, the character of Donna Anna in the original story is a passive and minor character, but in Mozart's *Don Giovanni* “her role is crucial, and she becomes Electra, the dramatic figure who sacrifices her life as a woman to avenge the death of her father.”²¹⁹ Mueller argues against the persistent belief (dating back to the early nineteenth century) that Donna Anna's fervor for revenge stems from a repressed passion for her seducer, stating “this is a possible drama, but it is not the drama Mozart wrote.” The use of D minor, strongly associated with revenge, is shown by Mueller to be in close connection to Anna throughout the opera as she unwaveringly pursues her goal.

It is fascinating to note that the intertextual approach which offers Mueller remarkable insight on Donna Anna (that is, she is Electra, and not repressed) also leaves her fiancé, Don Ottavio, not just unexamined, but misunderstood.²²⁰ Specifically, Mueller subscribes to the ineffectual Don Ottavio trope which dates back—ironically enough—to the very same critic who put forth the repressed interpretation of Donna Anna, one E.T.A. Hoffman. As discussed at length in the case study of *Don* in the present work, this view is dispelled by Mary Hunter's contextual approach which reveals that Ottavio epitomizes the contemporaneous concept of noble simplicity.²²¹ To reiterate, the *intertextual* approach reinterprets Donna Anna, the

²¹⁹ Mueller, 48.

²²⁰ Mueller, 48-51.

²²¹ Hunter, 211-212.

contextual approach reinterprets Don Ottavio, and together they reject persistent beliefs dating back to the same critic two full centuries ago. There is perhaps no more exemplary support for a multivalent approach than this.

Carl Schachter's analysis of Donna Anna's accompanied recitative and aria (Act 1, No. 10 of *Don Giovanni*) is profoundly different than either the preceding examples or the present study. But this is not to lay a critique against it, as Schachter's study of midground and local features allows for insights which would otherwise be impossible through tonality alone. In other words, this study is discussed here as a way to acknowledge how local and midground analysis can clarify the meaning of macro features, and how a macro perspective tacitly neglects this layer of meaning. Furthermore, Schachter's analysis is decidedly intramusical and formalist—two things many modern analysts argue loudly against. But it is through these same methods that the notes themselves, and the structures they create, can be recognized not just for their musical meaning, but dramatic meaning as well.

Schachter traces the pitch F# across Anna's accompanied recitative and aria, showing how it is *not* used to emphasize the relatedness of the two pieces, but to markedly differentiate them.²²² In the recitative, Anna recognizes Don Giovanni as her assailant, and recounts the horror of the opera's opening scene; while in the aria, she is looking forward to normalcy after exacting revenge. The two pieces thus form a continuous dramatic unit, but are of nearly opposite emotional and musical character. The recitative is also responsible for harmonic transition, here linking the preceding quartet in B \flat to the aria in D via the main key of the recitative itself, C minor; fundamentally creating a B \flat – C – D progression. Connecting the association of these keys with past, present, and future, Schachter notes "B \flat is the time before Anna recognizes

²²² Schachter, 16.

Giovanni as her assailant and her father's killer; C minor is her recognition; D is her trying to bend the future to her will through Ottavio."²²³

Against this tonal backdrop, F# initially seems to be an unlikely link, as it is chromatic in C and diatonic in D. In the C minor context of the recitative, F# (# $\hat{4}$) creates a tritone dissonance against the tonic, forcing it to resolve upward to G ($\hat{5}$); while in the D major context of the aria, G ($\hat{4}$) creates a tritone dissonance against C# ($\hat{7}$) which forces it to resolve downward to F# ($\hat{3}$). That is, F#-G and G-F# figures suffuse the foreground and midground structures of the recitative and aria, respectively, as shown throughout the analysis. Schachter's conclusion on the role of F# in the two pieces is particularly insightful, and included below.

This composite piece uses as its link an initially disturbing sound, foreign to the recitative's first key but integral to the key of the aria...The aria assimilates the strident, dissonant F# of the recitative into a consonant structure; it looks forward to a resumption of normal life after Don Giovanni's disruptions of the moral order will have been avenged. In the aria, the G becomes associated with C#, and the resultant diminished fifth becomes an important new element, enhancing the attractive power of F# supported by D as a consonant goal.²²⁴

The recontextualization of F# across the recitative and aria thus becomes symbolic of Anna's revenge quest as a whole—both in terms of its painful origin and hopeful resolution. The details of Schachter's analysis are too extensive to cover here; but through numerous analytical reductions, he shows how significant pitches, figures, and progressions all relate to the musical and dramatic landscape. Schachter's argument is effective because the scale (just two adjacent pieces) matches the locally-minded analysis. To conduct a score analysis with this level of detail across not one, but three full operas, would not only be a massive undertaking, but also be a fundamental mismatch of approaches. Schachter can point to things like prolongations or elaborations because he is operating at the appropriate level for those concepts. When analysts

²²³ Schachter, 11-12.

²²⁴ Schachter, 16.

apply these over huge spans of time, they are not only making suspect generalizations, they are also engaging in unit formation across countless numbers and acts which may not be a unit. Schachter's argument hinges on the dramatic throughline of Anna to create that unit; the existence of which renders it suitable for intramusical and formalist analysis.

As the present study is a macro reading of the Da Ponte operas, Schachter's methods are not applicable but they do serve to underscore the infinite nature of meaning. The meaning which local analysis would uncover remains latent but presumed extant—and in terms of the present study's exploration of meaning—is thus an unrepresented component preventing any claims of comprehensive understanding. Even supposing that particular task was completed, another and another would take its place, and still meaning would remain unchanged and infinite, a static and yet incalculable object beyond human understanding. And so, to reiterate a point made throughout the present study, this analysis—no matter how multivalent or holistic—can be no more than a single reading in the shadow of infinity.

The Syntax of Play

The following section assembles different perspectives on what might be understood as Mozart's playful nature, and how it manifests in his music—but more generally, the discussion involves analysis from a biographical lens. First, the study of number symbolism, or numerology, can lend itself to speculation, on occasion becoming essentially a pseudoscience, and thus it is only engaged in caution for the present research. Though discounting number symbolism entirely would naturally be the most cautious approach, this would overlook the long history of the intentional use of number symbolism in realms which Mozart was very familiar: Christianity, European art, and Freemasonry, to name but a few. Furthermore, Mozart's playful nature and personal enjoyment of games and puzzles—such as in riddles or wordplay—adds to the possibility that he may have hidden some in his own works. A more robust discussion concerning Mozart and play will follow after a brief detour into the research of Daemon Garafallo, whose work is of particular interest to the present study as it overlaps heavily with tonal planning.²²⁵ And while Garafallo's focus remains more on connecting these tonal plans to their numeric symbolism (especially within Freemasonry), he makes an interesting case which cannot be entirely overlooked.

Garafallo adds to the many competing interpretations of Mozart's *Die Zauberflöte* not as a straightforward fairy tale, but as a symbolic or allegorical work. Among these interpretations can be found political, religious, and psychological themes, but Garafallo sides with the “most widely accepted” Masonic interpretation.²²⁶ Through a survey of Mozart's life, the opera's plot, and a score analysis, Garafallo finds evidence for Freemason, Pythagorean, Christian, and riddle

²²⁵ Daemon Garafallo, “Mozart's ‘Die Zauberflöte’: A Kingdom of Notes and Numbers” (Master's thesis, Florida Atlantic University, 2016).

²²⁶ Garafallo, 46.

references alike, maintaining that Mozart's operatic creation is a direct mirror to his internal world. That is, *Zauberflöte* can be understood as a semi-autobiographical opera. Garafallo goes on to show that each character is associated with the key of their initial aria; and that at each character's downfall, tonal movement descends by minor third; and finally, at their eventual revival, ascends by major second.²²⁷ Garafallo connects both these numbers to contemporaneous masonic practice, where the number "two" represents the savior, and "three" the serpent.

Unfortunately—aside from the above observations on tonal plans—a large portion of Garafallo's work consists of unconvincing evidence for numerology in key signature (the number of accidentals), scale degree, and form (the number of the aria); as the evidence is heavily reliant on esoteric connections and transformations. But for the present study, the specifics of Garafallo's argument are of less concern than the broad premise that tonal plans have the potential to not only represent *intramusical* features (music, plot, characters etc.) but also *extramusical* features, such as social, political, religious, and autobiographical themes. A discussion of hidden codes is admittedly groan-inducing, but reframing this perspective to be more like "concealed concepts not yet identified" allows the present study to engage with musical meaning in a broader manner, accounting for the unknown.

Returning to the notion of play, the work of Peter Pesic will be discussed as a lucid contribution to a topic which has long been associated with Mozart—and to a certain degree, even plagued his reputation.²²⁸ Pesic draws attention to two competing views of Mozart and play: the first view emerges contiguously to the composer's death, and in conjunction with the broader nineteenth-century concept of "the figure of the divinely gifted man-child"; while the

²²⁷ Garafallo, 88.

²²⁸ Peter Pesic, "The Child and the Daemon: Mozart and Deep Play," *19th-Century Music* 25, no. 2-3 (Fall/Spring 2001-2002): 91-107.

second view arises as an early twentieth-century reaction, emphasizing the tragic, adult, and even demonic qualities of the so-called “gloomy Mozart.”²²⁹ Falling somewhere between the child and demon, Pesic’s Mozart avoids both the *idiot savant* and overcorrected-seriousness trappings of those preceding views by raising the significance of play itself, and acknowledging play as a deep and robust part of the creative process.

Historical accounts of Mozart’s playful nature are manifold, such as his love for billiards and Carnival, but of particular interest to Pesic comes by way of Leonard Ratner’s belief that the musical dice games of the time were no mere novelty, but deeply significant representations of music as an *Ars combinatoria* (combinatorial art).²³⁰ Leibniz’s seventeenth-century *Ars combinatoria* proposes that just as countless words are constructed from but a small group of letters, all concepts are built from the combination of a fairly small collection of simpler concepts, like an “alphabet of human thought.” Ratner famously argued that musical dice games were a metaphor for the inner machinations of the universe, revealing how permutations could be played with and combined at ever-higher levels, eventually forming a whole musical work—and ultimately changing how music itself was perceived.

Pesic broadly covers writings on the aesthetics of play, which extend back at least as far as Plato, and finds Friedrich Schiller’s eighteenth-century account to be particularly useful. Schiller promotes the notion of “freely associated ideas” which naturally emerge in play, and Pesic sees in the *Ars combinatoria* an analogous concept, where basic ideas combine into complex ones.²³¹ Much like a chess match which is deeply complex, but consists of individually simple moves, Pesic argues that Mozart uses “deep play” to raise the stakes of his compositions.

²²⁹ Pesic, 92.

²³⁰ Pesic, 93-95.

²³¹ Pesic, 96.

Discontinuities and departures from expectation are the evidence of play; and so, the patterns of motive, harmony, phrase, and so forth, need not be related back to single, germ ideas, since the play of expectation and surprise is the core feature.²³²

Conventionally, a variation of a motive normally requires some logical proof to be connected to a family of motives or a central motive; but in Pesic's view, no proof of relationship is required, as the deviation itself is of prime importance. In this way, play becomes a matter of syntax (form) as opposed to semantics (meaning), where play manifests as an unexpected event on the formal level. The well-worn adage that "comedy is all about timing" can also be understood as favoring syntax over semantics. In short, play does not require the musical material itself to be semantically playful, so long as the occurrence of material is freely associated, and in defiance of expectation, logic, or consequence.

Though Pesic does not directly connect syntax and play, a robust discussion of Mozart's syntax can be found in the work of Craig Harwood, and will be discussed below. Pesic also lightly mentions the connections between play, rhetoric, and Aristotle's beginning/middle/end concepts, but never engages them further. Thankfully, many studies exist in these lacunae (Ratner, Rosen, and Agawu have much to say about musical rhetoric, and are discussed at length elsewhere in this study) but at the present moment, this provides a nice segue into the work of Michel Vallieres, whose work on the perception of beginnings, middles, and ends supports the importance of these characteristics in the listening process.

* * *

Music perception studies, and cognitive psychology in general, should be regarded as critically important to the music theory community; as what may appear clear in score analysis,

²³² Pesic, 100.

may also have no bearing whatsoever on the lay listener. The “score domain” and “cognitive domain” emphasize different aspects of music, and what is clear in one domain may be concealed or absent in the other. This is not even to mention what may be termed the “physical domain” which includes questions of live performance, venue, and so on. Until features of the score are shown to be perceptually significant, their discussion should be regarded as an abstraction of uncertain importance to the listener. Many tonal planning or music theory studies which analyze works of considerable duration give little attention to the temporal and perceptual aspects of the music listening process. The reoccurrence of a tonality after a long span of time, for instance, may go unnoticed or unrecognized by a listener, despite the clarity of such an event in the score domain. This is not to say that music theory is insignificant until validated by cognitive psychology—as imperceivable and abstract features may have unforeseen and significant consequences—but that the equivalence between score analysis and the listening process should never be assumed.

Aristotle’s tripartite paradigm of formal function (beginning, middle, and end) can be applied broadly to any manner of expression which is temporal in nature—speech, music, or otherwise—but the paradigm has found particular favor in the analysis of classical era music.²³³ Partly due to the highly-conventionalized style of classical music, many music theorists have long endeavored to define what constitutes each formal function; but without any empirical evidence to support or refute such claims, any evaluation is largely speculative. This presents an opportunity for music perception studies to provide new perspectives through empirical results, and the work of Michel Vallieres on formal function delivers on just such a promise.

²³³ Michel Vallieres, “Beginnings, Middles, and Ends: Perception of Intrinsic Formal Functionality in the Piano Sonatas of W. A. Mozart” (PhD diss., McGill University, 2012): 1-3.

When viewed as rhetoric, a musical piece may be seen to have a beginning, middle, and end—but this is not limited to macro-level structure alone. Musical material at lower levels may exhibit similar temporal functions, such that a given passage can express a temporal position, or temporality. Vallieres investigates the perception of formal function (beginnings, middles, and ends) when temporal position is unknown; that is, whether formal function of a musical excerpt can be correctly identified without knowledge of its original placement or context. This is referred to as *intrinsic* formal function, and is in contrast to *contextual* formal function, which is the comparison of a given passage to surrounding material. The perception of temporality is often thought to occur via both contextual and intrinsic methods.²³⁴ Contextual identification of a passage relies on surrounding material; for example, if a passage occurs near the opening of a movement or piece, then it may easily be identified as a beginning due to proximity alone. In contrast, intrinsic identification relies on a set of norms common to a musical style that connects specific musical properties to formal functions. Through exposure and/or formal training, listeners may recognize these conventions—such as a particular harmonic cadence—and subsequently identify a passage’s intrinsic function regardless of contextual function. One interesting ramification of this theory is pointed out by Vallieres:

The formal function expressed by the materials (its intrinsic function) may be at odds with the one expressed by the context (extrinsic, or contextual), and therefore create a *formal dissonance*. An informal statement such as “this piece begins in the middle,” for instance, constitutes a claim for which the sense of “being in the middle” depends on the appraisal of the musical properties of a unit that is contextually defined as a beginning.²³⁵

In short, formal dissonance occurs when the temporal position, or temporality, of a passage is in opposition to its formal function. But the temporality of music is, of course, subject to considerable debate which somewhat obfuscates the simple binary between contextual and

²³⁴ Vallieres, 4-5.

²³⁵ Vallieres, 3.

intrinsic formal function, as described above.²³⁶ However, temporality remains an especially useful parameter when comparing the myriad of competing music cognition theories. For instance, Gestalt theory's preoccupation with segmentation and grouping is clearly a contextual perspective, whereas semiotic theories (such as those by Agawu) ascribe intrinsic meaning to musical materials.

There is also a question of aesthetic value which underlies the debate between intrinsic and contextual theories; namely, whether listener perception favors small-scale structures or large-scale form, thereby lending preferential value to that which is more strongly perceived. This question of musical aesthetics dates back considerably within philosophy, and the promise of validation through empirical psychology is naturally attractive. However, a review of scholarship in this regard, as put forth by Vallieres, reveals that the matter remains unclear—with a majority of results pointing to small-scale significance even as results by Gestalt theorists (such as Clarke, Krumhansl, and Deliège) favor long-term form.²³⁷

By playing out-of-context excerpts of Mozart piano sonatas for participants, Vallieres designed a series of experiments to examine three questions: if formal function could be correctly identified; whether musical training affected users' accuracy; and what musical properties influenced identification.²³⁸ Vallieres' study is the first to provide empirical evidence that participants, whether a trained musician or not, can correctly identify (with statistical significance) intrinsic formal function in musical excerpts.²³⁹ The details of the study are far too vast to discuss properly here, but some other results are as follows: ends were found to be the easiest function to identify; rhythmic features helped users discern between beginnings and

²³⁶ Vallieres, 7-9.

²³⁷ Vallieres, 11-13.

²³⁸ Vallieres, 15-17.

²³⁹ Vallieres, 250-252.

middles; and trained musicians had a greater sensitivity to harmonic and tonal cues. Ultimately, the relatively small effect which musical training had on the results prompted Vallieres to caution future music perception studies against the persistent belief that non-musicians lack the ability to discern unfamiliar features in classical music.

It should also be noted that Vallieres' study provides support for the broader cognitive model known as *prototype theory*. A theory of categorization, prototype theory holds that humans compare new concepts to pre-existing, prototypical concepts, such that membership in a category is graded. For example, a chair may be a more central member to the furniture category than a shoe rack. Musically speaking, prototype theory is here applied to the listening process, holding that any new material is compared to prototypes. The results of Vallieres' study suggest that participants perceive formal function according to prototype theory, making an "assessment of the excerpt's typicality with respect to a participant's mental representation of a given category."²⁴⁰ The three formal functions may each be understood as separate categories defined by certain characteristics, with any new musical material being judged, or sorted, according to those characteristics.

Having established the perceptual significance of formal function, a return to the field of musical aesthetics is in order. While more often referred to in terms such as rhetoric or syntax, the fundamental equivalence to formal function is obvious—though largely unrecognized. It is hoped that through multidisciplinary endeavors such as this one, that the translation between disparate fields is facilitated; and for the purposes of this study, the terms will be understood as synonymous.

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²⁴⁰ Vallieres, 203.

Through the previous discussion on the work of Pesic, ramifications of syntax, play, and *Ars combinatoria* centered more so on the biographical; but the work of Craig Harwood focuses these same factors on the musical gestures themselves. Harwood also introduces the eighteenth-century notion of deception as a significant influence on Mozart, and connects the entire discussion to prominent writers in various fields. Thus, listener expectation and the musical surface reference Leonard Meyer; conventions of formal function and semiotic signs reference Charles Rosen and Kofi Agawu; and the play of permutation and *Ars combinatoria* reference Leonard Ratner and Peter Pesic.²⁴¹ Each of these writers overlap more than the prior sentence permits, and since their works are discussed at length elsewhere in the current study, they will not be detailed presently; but as the inclusion of deception is unique to Harwood, this warrants a discussion below.

The impression of Carnival, with its masks and mischief, is frequently cited in relation to the subversive aspects of Mozart, but some lesser-known factors (first argued by David Schroeder)²⁴² such as epistolary deception and French literature, allow Harwood to locate these qualities of Mozart more effectively.²⁴³ First, the letters, or epistolary correspondence, between Mozart and his father contain numerous instances where Mozart conceals the truth. To waylay Leopold's barrage of advice, Wolfgang often overstates his obedience, and even lies about personal and professional events. Furthermore, the use of epistolary deception in contemporary French literature would have been initially familiar to Mozart through his personal copy of Molière's comedies; and later, during his residence in Paris with Madame Louise d'Épinay. A

²⁴¹ Craig Eric Harwood, "Subversive Strategies: Conventions and Manipulation of Gesture and Syntax in Mozart" (PhD diss., Yale University, 2002): 1-22.

²⁴² David Schroeder, *Mozart in Revolt: Strategies of Resistance, Mischief and Deception* (New Haven, CT: Yale University Press, 1999).

²⁴³ Harwood, 29-34.

figure of certain standing in Parisian intellectual circles, Mme. D'Épinay was friends with many prominent writers including Rousseau, Diderot, and Voltaire—all of whom were renowned for their irony and deception.

It is specifically in the French conception of deception that Mozart's own becomes clear, namely that Mozart “does not simply deceive the listener but instead invites the listeners to engage in his deception.”²⁴⁴ That is, the listener is not made to be the fool in a binary (deceiver-deceived) but to be a participant exploring, and even enjoying, the consequences of that deception. Harwood notes that this requires a listener who is not only aware of the norms and conventions which are being subverted, but also one who consents to the game. And just as French epistolary fiction obfuscates the author-reader relationship, inviting the possibility that the author is also deceived, Mozart plays with the possibility of his own deception “by examining the potential for the norms to be denied and thereby pushing the limits of musical comprehensibility.”²⁴⁵ In short, it is music as a revelry in deception, or as a form of Carnival itself—one which uses the norms and conventions of the Classical style as a conduit to empower the game.

Through score analysis, Harwood shows how Mozart advantageously manipulated conventional material to subvert listener expectations while still ensuring comprehensibility. This is predicated on the notion that the Classical style was particularly conventionalized, with clear norms differentiating beginning, middle, and ending material. It is interesting to note that just a decade prior to Harwood's work, influential scholars such as John Platoff were nascently pointing to conventionality as a way to differentiate Mozart from the classical style in general.²⁴⁶

²⁴⁴ Harwood, 29.

²⁴⁵ Harwood, 30.

²⁴⁶ John Platoff, “How Original Was Mozart? Evidence from ‘Opera Buffa’,” *Early Music* 20, no. 1 (February 1992): 105-117.

But while early discussions would present originality and conventionality in opposition, Harwood's stance is more complex, partly owing to the inclusion of play and deception. Harwood identifies three methods by which Mozart engaged convention: by opening works with closing gestures, closing works with opening gestures, and reordering material on the intra-thematic level. With the three aforementioned categories, Harwood conducts score analysis on Mozart's sonatas, chamber works, and symphonies to identify why each deviation is made. Particular attention is also given to how Haydn, whose musical wit is often discussed, preferred more overt manipulations than Mozart; and how Mozart's own manipulations can be understood not so much as disorienting listeners, but "better understood as reorienting listeners."²⁴⁷

Harwood's Mozart is thus not compelled to either submit to convention or else covertly subvert it—but free to challenge and celebrate those same norms. What Harwood refers to as relocation of material or contextual dissonance can be understood in perceptual studies as formal dissonance, and it is specifically the *gradation* of that characteristic which occupies much of Harwood's work. That is, Mozart not only plays with formal dissonance, but gradually manipulates the syntactical function of material until its formal function matches its temporality. Harwood points to an example of such recontextualization:

In the Finale Mozart's Symphony, K. 543, on the other hand, the process of relocating the opening motive takes place over the entire movement. By continually placing the motive in different contexts, it is de-contextualized from its initial function as an opening, and gradually re-contextualized as a closing gesture. By the end of the movement, the motive has been so effectively associated with a closing function that it works perfectly well as the closing gesture.²⁴⁸

Aside from formal dissonance, which accounts for two of Harwood's categories, *Ars combinatoria* can clearly be seen in the third category, thematic reordering. By splitting a theme

²⁴⁷ Harwood, 203.

²⁴⁸ Harwood, 200.

into motives and altering their order, Mozart is not only creating surprise, but playing with melody as permutation—a key aspect of musical dice games. In the context of the present study, what all this syntactical play amounts to is a level of musical meaning available only to those listeners aware of stylistic conventions. Without prior knowledge of the norms for each formal function, listeners—not to mention computers—risk overlooking a critical feature in much of Mozart’s work. The playful deception and games of Mozart stand as yet another channel of information, or meaning, which can easily disappear for both analyst and listener alike.

It should briefly be noted that the logical result of raising deception to such great heights, is that its implicit twin—recognition—ascends likewise. Jessica Waldoff’s excellent dissertation on these moments of recognition in Mozart’s operas sets itself apart by examining not just the plot, but the music as well, and which specific musical features are used to articulate such significant, and occasionally even cataclysmic events.²⁴⁹ The sheer frequency of recognition scenes in opera, or moments when characters shift from ignorance to knowledge, may be attributable to the zeitgeist of the Enlightenment, which held themes of knowledge in high regard. Through score, plot, and contextual analysis, Waldoff finds that moments of recognition,

are almost always realized in musical terms. These moments are often set apart by a double bar, fermata, or sudden shift in tempo or dynamic; the enacted events are usually characterized by further shifts in key, texture, melodic line, and even overall style, or are otherwise marked by some musical means.²⁵⁰

The extent of Waldoff’s analysis is truly tremendous; dedicated chapters are given to three operas, while nearly every other mature opera by Mozart is given special attention as well. And though the details of these analyses cannot all be considered here, what gradually emerges is the understanding that recognition as “moment” is too reductive, and that recognition as “theme”

²⁴⁹ Jessica Pauline Waldoff, “The Music of Recognition in Mozart’s Operas” (PhD diss., Cornell University, 1995).

²⁵⁰ Waldoff, 9.

is not only more accurate, but better aligned with the themes of knowledge or self-discovery running throughout Mozart's operas.²⁵¹ To analyze through this lens is to see operas as vehicles of discovery, or demonstrations of knowledge found (identity, purpose, self-awareness etc.)—not just for the characters on the stage but for the audience as well, and the real world they inhabit. While attention is naturally attracted to their moments of culmination; recognition and its counterpart, deception, are pervasive themes of knowledge extending not just throughout the operas, but to the Enlightenment in general.

²⁵¹ Waldoff, 129-130.

CHAPTER 4: MUSIC THEORY AND PSYCHOLOGY

Toward Listener-Based Music Theories

Music theory describes the construction of music, and for a great deal of its history, has been preoccupied with the analysis of pitch and rhythm elements. This so-called “conventional” music theory is well-equipped for the common practice period, but as the notion of what constitutes “music” has expanded, so too have the approaches of music theory proliferated. In each of these various methods, it is clear that different elements are emphasized, diminished, omitted, and added; such that the analysis is itself an interpretation—a point argued convincingly by James Webster.²⁵² There is no objective analysis and subjective interpretation—the two are not discrete or in opposition—they are unavoidably entwined.

The question of analytic approach appears especially germane to eighteenth-century operatic music, given its highly multifaceted nature. Not only authored by a composer but a librettist as well, with further influences arising from the impresario, stage-director, set-designer, singers and so on; opera of the time was (and continues to be) decidedly collaborative. Furthermore, features related to the plot, the conventions of genre, and social meaning suggest a more contextual, or musicological approach than that provided by conventional theory alone. But Webster cautions against any dichotomy between instrumental and operatic analysis, as both forms of music can be understood as rather fluid, context-dependent entities. Given Webster’s stance on the equivalence of analysis and interpretation, his study on Mozart’s opera buffa is a case-study designed to be extrapolated to all forms of music, and even meaning in general: “The possibility of meaning is open with respect to all music—whether we locate that meaning in the

²⁵² James Webster, “Understanding Opera Buffa: Analysis = Interpretation,” In *Opera Buffa of Mozart’s Vienna*, edited by Mary Hunter and James Webster, 340-377 (Cambridge, UK: Cambridge University Press, 1997).

individual work (hermeneutics), in performance, in musical tradition (intertextuality), in genre, in reception, or in [cultural practice].”²⁵³

The present study proposes that meaning may be understood as multi-positional or probabilistic, like an atomic orbital, as it is a function of (among many other factors) the approach used in analysis/interpretation. As such, various stances in music theory, musicology, and aesthetics will be entertained in this research, with special interest given to theories which foreground the listener. This will be done ultimately to interface with the field of psychology in general, as the empirical results in cognitive, or perceptual, studies are highly pertinent (and potentially supportive of) what may be termed “listener-centric music theory.” Attention will also be given to music theories related to tonal planning, as the macro approach inherent to the field is relevant to the profoundly macro approach used by the current study (that is, the comparison of three of Mozart’s full-length operas). To aid with what would otherwise be an interminable endeavor manually, audio analysis by computer (known as music information retrieval) will be utilized, as it naturally provides novel approaches both within and adjacent to tonal planning. Throughout, musicological and social considerations will provide depth and contrast to the more music theory aspects of this research. With a combination of interdisciplinary approaches to the question of meaning in Mozart’s music, it is hoped that a broader understanding of how musical meaning translates is revealed.

* * *

In an early application of Gestalt theory and cognitive science to the field of music theory, James Tenney created a method of analysis in his 1961 master’s thesis which was

²⁵³ Webster, *Understanding Opera Buffa*, 375.

designed for the “increased aural complexity” of twentieth-century music.²⁵⁴ Dissatisfied with negative qualifiers such as *atonal* which relegated new music to be a mere deviation of functional tonality, Tenney wrote *Meta+Hodos* (titled after the Greek roots of “method”) to describe the perceptual analysis of new music materials. While conventional music theory addressed the functional relationship of consonance and dissonance—and the resulting preeminence of pitch which had defined so much of Western art music—it was ill-prepared to analyze music built on other principles such as timbre, texture, or intensity. Tenney explored some of these new materials, like tone clusters, noise, and silence, and concluded that “whereas in earlier music the responsibility for the articulation of musical ideas was mainly given to the pitch-parameter, the other parameters have begun to carry more and more of this responsibility, sometimes even to the extent of replacing the function of pitch altogether.”²⁵⁵ The fundamental unit for analysis could thus not be of pitch alone, but something broader.

In lieu of pitch as a foundational element, Tenney termed the word “clang” for a sound or sound-configuration *perceived* as a primary aural unit.²⁵⁶ A clang can be unified around any musical parameter (pitch, timbre, register etc.) and it is the core principle of *Meta+Hodos*. It is important to note that the definition of clang establishes a hierarchical structure (in that there are primary elements which are formed into larger configurations) as well as emphasizing the role of listener perception. Furthermore, the clang as *unit* is significant in that it allows Gestalt theories of grouping to apply directly to clangs.

Gestalt psychology theorizes that perception is a process of organization, where units are formed by the cohesion and segregation of smaller elements, so that larger patterns are

²⁵⁴ James Tenney, *Meta+Hodos: A Phenomenology of 20th-Century Musical Materials and an Approach to the Study of Form and Meta Meta+Hodos* (2nd ed., Oakland, CA: Frog Peak Music, 1988): 4.

²⁵⁵ Tenney, 18.

²⁵⁶ Tenney, 23.

assembled. A number of cubes and balls scattered across a floor, for example, may suggest certain shapes and groups based upon proximity and type. Though conventionally applied to visual perception, Tenney adapts the concepts of Gestalt psychology for the aural medium. Thus, the positional proximity of visual Gestalt becomes the temporal proximity of aural Gestalt; sounds which occur closer together are more likely to be grouped than those separated by a large span of time. Likewise, sounds exhibiting similarity are more likely to be grouped. Similarity can arise from any musical attribute (pitch, timbre, dynamic level, articulation etc.) and when a given element is assigned to the y-axis, it can be graphed with time on the x-axis. This visual representation, or *parametric profile*, of the change in a particular parameter over time allows Tenney to directly apply visual Gestalt concepts to graphs.²⁵⁷

Aside from the aforementioned primary factors of cohesion and segregation (proximity and similarity) Tenney includes three secondary factors: intensity, repetition, and listener expectations. Taken as a whole, these factors can be applied to parametric profiles and used to determine clangs. Larger configurations are possible by grouping clangs into *sequences* which can then continue to be successively grouped until overall form is determined. Using the same principles of unit-formation at all levels, Tenney's recursive process thus begins with the lowest-level clangs and finishes with highest-level form.²⁵⁸ For Tenney, form is the listener's perception of structure and movement: both the "static" arrangement of aural units, and the "dynamic" change between successive units.

But as is unfortunately common with rule-based models, what first appears to be an elegant and simple system on paper becomes an ambiguous and complex task in practice.

Meta+Hodos was the first in a line of scholarly works that Tenney published—often in

²⁵⁷ Tenney, 33-34.

²⁵⁸ Tenney, 56.

collaboration with Larry Polansky—that introduced an ever-expanding set of definitions designed to combat vagueness with concrete, quantifiable principles. This is exemplified in their 1980 study which attempted to solve the myriad exceptions and contradictions with a computer program designed to segment monophonic music on multiple, hierarchical levels.²⁵⁹ Though the results proved promising (often agreeing with phrase structures determined by conventional music theory) the process still relied on innumerable subjective judgements; namely, the weights assigned to various parameters.²⁶⁰ It remained unclear how multiple, simultaneously occurring parameters (which could potentially be changing in contradictory ways) could be objectively quantified, weighted, and summed such that the most salient parameters affected unit-formation properly. And even more critically, it remained empirically unproven that considering music as multi-dimensional perceptual space (with each dimension being a different parameter) had any psychological basis in terms of cognitive science.

Despite the flaws of *Meta+Hodos*, the immense promise of Gestalt psychology went on to influence many music theorists; notably colliding with Noam Chomsky’s generative linguistic theory in the work of Lerdahl and Jackendoff, whose *A Generative Theory of Tonal Music* (GTTM) became a foundational contribution to the field of cognitive music theory.²⁶¹ By viewing music theory as a model of human cognition, GTTM continued to shift the focus of analysis away from musical structures and toward the listening process itself. This radical shift in perspective introduced the possibility of testing music theories through empirical studies in experimental psychology while also reframing the field of music theory as a subdiscipline of psychology. In their opening statements, the authors assert that music is much more than a score,

²⁵⁹ James Tenney and Larry Polansky, “Temporal Gestalt Perception in Music,” *Journal of Music Theory* 24, no. 2 (Autumn 1980): 205-241.

²⁶⁰ Tenney and Polansky, 211.

²⁶¹ Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge, MA: MIT Press, 1983).

performance, or mere physical vibrations—it is a “product of human activity” which exists as a “mentally constructed entity.”²⁶²

Generative grammar, especially by Chomsky (who was Jackendoff’s teacher),²⁶³ is the theory that an innate system of rules is used by the mind to structure and understand sentences. And while Lerdahl and Jackendoff acknowledge that GTTM owes much to generative grammar, they are careful to distance themselves from any direct or literal applications of linguistic models (subject, predicate, and so on) to music theory. They are more interested in applying the formal framework of generative grammar to ultimately arrive at an understanding of music cognition and to “specify a *structural description* for any tonal piece; that is, the structure that the experienced listener infers in his hearing of the piece.”²⁶⁴ Accordingly, the authors construct a set of rules by which to analyze music. The system involves a fairly complex hierarchical method of grouping which adopts notions of prolongation and long-term structure drawn from Schenkerian analysis while introducing the *well-formedness* and *preference* rules from Gestalt theory. In essence, GTTM is score analysis made ostensibly from the listener’s perspective, with a strong emphasis on grouping and global structure.

In a recent appraisal of GTTM, Niels Hansen details its theory, typical points of criticism, and significant legacy. With regards to its reception in music theory circles, Hansen finds intriguing similarities between Schenkerian analysis and GTTM: both theories reduce music to an underlying *Ursatz* (or fundamental structure) according to hierarchical and elaborative principles, while also determining structural significance according to syntax rather than surface

²⁶² Lerdahl and Jackendoff, 2.

²⁶³ Niels Chr. Hansen, “The Legacy of Lerdahl and Jackendoff’s ‘A Generative Theory of Tonal Music’: Bridging a Significant Event in the History of Music Theory and Recent Developments in Cognitive Music Research,” *Danish Yearbook of Musicology* 38 (2010-2011): 34.

²⁶⁴ Lerdahl and Jackendoff, 6.

saliency.²⁶⁵ Furthermore, GTTM adds temporal and psychological components which conventional Schenkerian analysis lacks, leading one to question why GTTM has been largely neglected in both music analysis and music theory curriculum. Hansen argues that GTTM is flawed, lacks applicability, and has fallen out-of-favor with the cognitive science community. Owing to its immense complexity, no comprehensive method of analysis for GTTM exists, as it is alternately too vague or over-formalized. Despite “claims of universality” the theory makes many presumptions about the listener, and is preoccupied with “global, hierarchical listening” which is at odds with many current cognitive theories and empirical findings, which favor more local listening.²⁶⁶

Though Hansen aims to bring more attention to GTTM, he ultimately questions the future relevance of rule-based, Gestalt models in cognitive modelling—as models based around unsupervised statistical learning have demonstrated better empirical results, while also accounting for cultural differences. But as argued at length by McKay,²⁶⁷ the presumed supremacy of statistical models over categorical (rule-based) models is largely unfounded and unclear. McKay’s stance in this regard may thus be seen as a rebuke of popular opinion, while Hansen’s stance as not necessarily incorrect, but typical of current cognitive research.

Despite what appears to be an unavoidable death sentence, Lerdahl and Jackendoff’s theory maintains significance for the historical precedent it set in strongly connecting psychology and music theory. Though *Meta+Hodos* predates GTTM by over a score of years, its influence has failed to reach beyond the music theory community; or at least not to the same degree as GTTM, as evidenced by its complete lack of mention by Hansen. As the current field of music

²⁶⁵ Hansen, 52.

²⁶⁶ Hansen, 54.

²⁶⁷ Cory McKay, “Automatic Music Classification with jMIR” (PhD diss., McGill University, 2010): 50-54.

cognition becomes increasingly interdisciplinary, with neuroscience and computational modelling prompting new research, the role of the listener continues to be significantly foregrounded. Hansen refers to this prioritizing of the listener as the “cognitive paradigm”²⁶⁸ and though he squarely credits GTTM alone for establishing this perspective, it may be understood that the connection to Gestalt psychology was begun by Tenney’s *Meta+Hodos*, and was part of a broader desire for interdisciplinary approaches in music theory.

As has been stressed above, both *Meta+Hodos* and GTTM are Gestalt-based theories bridging the divide between music theory and psychology; but the Gestalt preoccupation with grouping, and the numerous rules or principles of that grouping, creates in both theories a rather messy and unproven system. The broad premise of these theories has since proven highly influential however, with GTTM in particular spawning numerous variants and alternatives, most-notably by Irène Deliège. But before entering into a lengthier discussion on this line of works, which may be understood as fundamentally rule-based, a historical precedent for an alternative system must be discussed. Devoid of rigid and specified rules, probabilistic systems incorporate randomness, and are comparatively quite fluid and adaptable. Given the current inclination for machine learning systems (which are by-nature probabilistic) as a tool for cognitive modelling, the significance of probabilistic models becomes apparent.

* * *

Musical experience as a probabilistic, psychological process can easily be traced back to the highly influential contributions of Leonard Meyer beginning in the late 1950s.²⁶⁹ Meyer’s theories use information theory and probability to understand the communication of meaning

²⁶⁸ Hansen, 34.

²⁶⁹ Leonard B. Meyer, “Meaning in Music and Information Theory,” *The Journal of Aesthetics and Art Criticism* 15, no. 4 (June 1957): 412-424.

through music. And since unsupervised learning and statistical models are promising tools in modern cognitive psychology, as stated above, Meyer's work remains a relevant perspective in the field for establishing mathematical probability as a viable tool in understanding musical experience. But it should be noted that—even aside from the probabilistic tenets—Meyer's keen and lucid observations on musical meaning have had profound impacts on the field of musical aesthetics, with innumerable works, including those by Ratner and Agawu (both discussed at length in this study) being deeply indebted to Meyer. In this way, Meyer's influence can be seen as multifarious, with the fields of music theory, musical perception, and musical aesthetics continuing to echo his work. This warrants a more detailed account of Meyer's theories, which will be discussed presently.

Meyer adheres to the view that meaning is essentially tripartite and referential in nature, stating that it arises “between a stimulus, the thing to which it refers, and the individual for whom the stimulus has meaning.”²⁷⁰ Meyer further divides meaning into two subtypes, designative and embodied, where designative is when a stimulus refers to something which is *different* than itself in type, while embodied is when a stimulus refers to something which is the *same* as itself in type. For example, the word “dog” is designative, as it refers to an animal which is not itself a word, whereas the sound of thunder is embodied, as it is one aspect of the thing to which it refers—a storm. In terms of music, designative meaning is extramusical, such as emotional or social content, while embodied meaning is intramusical, such as the leading tone suggesting the tonic. Intramusical meaning is the focus of Meyer's theories, since it is more amenable to rules of syntax (e.g., the tonic often follows the dominant) than extramusical meaning (e.g., a jubilant section follows a solemn one) which is more semantic in nature.

²⁷⁰ Meyer, 412-413, 416.

Syntax, grammar, or the succession of musical content forms the foundation of Meyer's theories, as it allows one to consider music as another form of communication; and furthermore, the communication of information, or meaning, can be understood in very different terms than music normally suggests. As such, Meyer draws from information theory and conceives of music itself as a Markov process.²⁷¹ Information theory holds that the amount of uncertainty in a system is a measure of both entropy and information. More uncertain (higher entropy) situations provide more information; for example, the roll of a six-sided die, which is more uncertain than the flip of a coin, thereby provides more information. Probability may be modeled by many different equations; but a Markov process, or chain, is a specific type of random, mathematical sequence of events (in this case the events are musical notes) in which the probabilities of future events depend upon previous events.

To understand how Meyer arrives at a Markov process specifically, and how this connects to musical meaning at all, one must backtrack slightly to considerations of style. There are, of course, many different musical styles which may each be understood as a separate language, but to view style as discourse alone would be to miss half of Meyer's argument. So although the style of music varies by culture and era, "what remains constant from style to style are not scales, modes, harmonies, or manners of performance, but the psychology of human mental processes."²⁷² Meyer proposes that the norms of a style create an analogous mental construct—one used to perceive music. And once this stylistic-mental construct is shared amongst composers, performers, and listeners, it may be understood as a system of probabilities; for example, the aforementioned observation that the tonic *often* follows the dominant.

²⁷¹ Meyer, 419.

²⁷² Meyer, 413.

Through awareness of stylistic norms, listener expectations—say, of the probable consequences of a dominant chord— arise, and during the course of a piece these expectations are both fulfilled and denied. In fact, these unexpected events, or deviations from style which create uncertainty in the listener, provide Meyer a connection back to information theory. As stated above, more uncertainty means more information (meaning), and thus the uncertain listener perceives more meaning. In short, any given musical style may be understood as a complex mental system of probabilities, or a flow of musical grammar (syntax) generating expectation and uncertainty in the listener through deviations to stylistic norms.

As a Markov process, or a piece of music unfolds, the uncertainty of subsequent events occurring decreases as the likelihood of various conclusions increases. In other words, the listener learns to predict musical behavior based upon the patterns already established by the piece. But Meyer is careful to point out that if music were to behave entirely as a Markov process, then surprising events could not occur towards the conclusion of a piece, where uncertainty would theoretically be minimal.²⁷³ He credits *designed uncertainty*—or, the intentional subversion of listener expectations—as a key feature in musical communication. Aside from intentional deviations to the Markov process, Meyer believes there are two unintentional, complimentary forces in musical language: *noise* and *redundancy*. Noise in this sense can either be acoustical or cultural, where the latter occurs when a listener is unfamiliar with the cultural cues or conventions inherent in a style. It should be noted that acoustic noise as an intentional feature in music is not Meyer's concern here; rather, noise as an unintended consequence of poor venue acoustics, faulty speakers, or any other interfering sound. Combating the disruption of noise, redundancy amplifies the musical signal through extra reinforcement.

²⁷³ Meyer, 418-420.

This could be repetitions of musical material, doubled tones, or any other feature that is governed by statistical rules, and able to be omitted without sacrificing meaning.

As can be observed, Meyer's line of logic can be somewhat convoluted, resulting in questionable dependencies. For instance, if meaning arises from uncertainty, but uncertainty arises from the expectations of stylistic norms, then no meaning can exist without style. In other words, style is a precondition for meaning, and without the culturally established norms of style, meaning cannot be communicated. To suggest that norms are not just factors but prerequisites for meaning seems exceptionally audacious, as one can readily imagine finding meaning in previously unheard-of styles. The apprehension of cultural noise, even if pure, or wholly dissimilar to one's previous experience, does not preclude the possibility of meaning. While there may be no stylistic frame, there are yet larger and completely unavoidable frames; such as that formed by any music-listening experience, and even auditory perception in general. In short, because the experience is still auditory, it cannot be entirely novel. One might consider that any "first sound" can carry meaning as well, such as the call of an unseen and unknown animal, the mesmerizing clatter spewed forth from the first combustion engine, or the near-silence found when first encountering an anechoic chamber. The context of human listening, borne from experience and biology, is omnipresent in any music or sound. As meaning can be found not just in music, but also in noise and silence, it seems that meaning is more like an ether—unavoidable and ubiquitous.

Despite some shakiness in specifics, what constitutes the vast majority of Meyer's work continues to be highly influential. By framing the comprehension of musical meaning as a real-time, listener-centric process, where a stream of musical information is navigated by listener expectations, Meyer set a powerful precedent in music cognition. In short, he advanced the claim

that expectations shape musical experience. But aside from using mathematical probability to model musical experience, Meyer's work remains a relevant perspective to the field of music aesthetics as well. Music as a syntactical stream of information filtered by style and cultural norms, as put forth by Meyer, continues to find currency in aesthetics, as the above discussions on Rosen, Ratner, and Agawu illuminate.

It is the view of the present study that the Gestalt models covered thus far (*Meta+Hodos* furthered by GTTM) as well as the stochastic model (Meyer's information theory) both contain valid insights into musical meaning. Neither perspective can be disregarded if a comprehensive accounting of meaning is to be taken seriously. The holistic view taken by McKay which allows for both categorical and statistical approaches (those being the equivalent terms in the field of computer science) is thus also adopted here. And furthermore, the assumption that these are the only two fundamental options, and that their evaluation should be with regard to how accurately they model human cognition, is outright rejected. McKay elaborates that "computers process information in ways that are intrinsically different from the mechanisms used by the human brain, and the best approaches to modelling human behaviour with computers may well be very different than those actually used by humans themselves."²⁷⁴ When classifying the genre of a song, for instance, humans can make subjective and even irrational judgements which defy clear logic—rendering any single model insufficient. The following section will cover rule-based cognitive psychology studies supporting and expanding upon GTTM, beginning with highly notable contributions by Deliège (which McKay points to as an influence on jMIR, the main software used in the present research).²⁷⁵

²⁷⁴ McKay, 87.

²⁷⁵ McKay, 96.

The Psychology of Listening

Irène Deliège builds on Lerdahl and Jackendoff's Gestalt-based approach by presenting a new model of listening dependent upon cognitive economy.²⁷⁶ Significantly, Deliège accounts for memory capacity by focusing on how listeners determine salient features, or *cues*, as a means to developing a progressive mental schema of a piece, and how further segmentation of that material aids organization of temporally distant events.²⁷⁷ Deliège's research suggests that with limited memory capacity, listeners use only the most distinctive features to define and "abbreviate" a motif (a process called *cue abstraction*) so that it may be efficiently recognized in new material. As a motif recurs and is subjected to variations through the course of a piece, the listener is occupied by a continuous process of recall, comparison, and categorization of cues which forms the core of Deliège's model. In other words, spontaneous cue abstraction is followed by comparative evaluation, resulting in categories which can be repeatedly concatenated into higher hierarchical levels of musical structure, producing an auditory image.

Through a large body of empirical research, Deliège has continued to provide supportive evidence for her model while also attempting to elucidate the processes of cue abstraction and auditory image construction. In particular, her 1996 study using a Bach violin sonata found that non-musicians, as compared to trained musicians, have a narrower conception of similarity when comparing motifs, and that "all cues do not exhibit equivalent perceptual validity and functional value."²⁷⁸ Both groups of participants appropriately separated the motifs of the sonata into two broad families, but non-musicians tended to subdivide the families significantly more. In addition, rhythmic cues were found to be highly influential, while many other cues were context-

²⁷⁶ Irène Deliège, "Cue Abstraction as a Component of Categorisation Processes in Music Listening," *Psychology of Music* 24 (1996): 131-156.

²⁷⁷ Deliège, "Cue Abstraction," 131-135.

²⁷⁸ Deliège, "Cue Abstraction," 154-155.

dependent; however, cues in all cases were subject to individual difference regardless of training. While Deliège's rule-based model is naturally a simplification of a more complex listening process, it differentiates itself from rigid Gestalt approaches such as GTTM by foregrounding cognitive economy and allowing for individual difference. Critically, cue abstraction shifts the Gestalt focus away from music as a written object and toward music as an auditory entity and listening process. It is primarily a cognitive model of a perceptual process, and only subsequently a model of musical analysis.

Though specifically designed for music perception, Deliège's cue abstraction model is based on more general perception theories which hold that memory formation results from focused attention on key elements.²⁷⁹ It is also important to note that cue abstraction occurs at the start of music perception. When something attracts the listener's attention, it must first be stored in memory efficiently, and so requires a concise representation to reduce mental load. This label, or cue, is thus stored in real-time, and also acts as a marker in the mental line of a piece's progression. In short, a cue articulates the mental schema which the listener is progressively building. As new cues are abstracted, grouping and comparison can take place according to Gestalt laws, leading finally to a structured musical space. And with regard to those laws, Deliège argues that all Gestalt laws—especially in music perception—are primarily based around the principles of *similarity* and *difference*; as this “accounts for the emergence of boundaries within a total structure: a grouping boundary is invariably perceived where there is a perceived *difference* between the groups adjoining the boundary, as opposed to a *similarity* between the elements within the groups.”²⁸⁰

²⁷⁹ Irène Deliège, “Similarity Perception ↔ Categorization ↔ Cue Abstraction,” *Music Perception: An Interdisciplinary Journal* 18, No. 3 (Spring 2001): 237.

²⁸⁰ Deliège, “Similarity Perception,” 235.

Deliège’s cue abstraction model uses Gestalt laws, but it also produces a structural hierarchy more indicative of categorization models found in information processing; and as such, situates Deliège’s model somewhere between GTTM and Leonard Meyer. In categorization models, members of a category are subject to centrality comparisons, where individuals are judged against the prototypical member at the “core” of the category. For example, the category of “chair” may have a standard, four-legged table-chair at its core, while a beanbag would be more distal. Variations of a category are said to occupy the *subordinate* level, which is successively below the *basic* and *superordinal* levels. In keeping with the previous example, the highest, superordinal level may be “furniture” while the middle, basic level would include all types of furniture (such as chairs, tables, dressers etc.) and the lowest, subordinate level would include all variations of these basic types (all variations of chairs, tables, dressers, and so on). Deliège translates this categorization into musical perception by means of her cue abstraction model: structural organization of a piece occupies the superordinal level, cues occupy the basic level, and variations of each cue occupy the subordinate level. Deliège emphasizes the role of similarity and difference in generating this hierarchical, mental schema, stating:

Viewed from the perspective of *similarity*, [variations of cues] generate an *imprint*, that is, an analogue of the *prototype* viewed from the angle of *typicality*...Finally, the effect of the principle of difference is to segment the work into periods. Those structures that are gathered around each cue that is abstracted at the basic level—that is, the collection of variations derived from the cue—are grouped together at the higher level, the *superordinal*.²⁸¹

It should briefly be noted that although musical structures from the Western tradition (such as theme, motif, and variation) are not incompatible with cue abstraction, they are not necessarily synonymous with it either.²⁸² So although a cue may represent a motif, it is far less

²⁸¹ Deliège, “Similarity Perception,” 240.

²⁸² Deliège, “Similarity Perception,” 239.

likely to represent something larger, such as an entire exposition section. Musical structures commonly and easily identified in score analysis can be very large and complex in perceptual space, and the efficiency required in real-time perception necessitates the labelling of salient (and more local) features via cue abstraction. In fact, a large portion of the literature following (and simultaneous to) Deliège's work has centered on what specific musical characteristics actually lead to cue abstraction, or what draws the focus of listeners. While most studies have used tonal materials, Deliège herself occasionally used post-tonal materials to remove more conventional parameters—a precedent which Addessi and Caterina follow, in the study discussed below.²⁸³

Post-tonal music often avoids well-differentiated material, repetition, and formal clarity. This poses an interesting challenge to the cue abstraction process, which frequently uses these same characteristics to create a mental schema. Addessi and Caterina reference numerous studies showing that—when confronted with post-tonal music—listeners instead turn to dynamics, duration, speed, and timbre to provide musical cues.²⁸⁴ This suggests that the listening process of cue abstraction remains trained on particularly prominent surface features, even without the presence of hierarchical harmonic, melodic, and rhythmic structures. Given that the cue abstraction model repeatedly stresses that listeners are more sensitive to surface features than structural ones, the result should not be altogether surprising. But this is not to say that structure, or macroform, is insignificant in Deliège's model, as structural perception is seen as the ultimate goal, or end result of the entire process.

Addessi and Caterina connect the musical surface to macroform through *segmentation*, or the “perception of contrasts, discontinuities, changes and repetitions” which allows for the

²⁸³ Anna Rita Addessi and Roberto Caterina, “Perceptual Musical Analysis: Segmentation and Perception of Tension,” *Musicae Scientiae* 4, No. 1 (Spring 2000): 31-54.

²⁸⁴ Addessi and Caterina, 33.

separation of sections.²⁸⁵ Critically, the notion of tension as a factor in segmentation is also introduced. The relationship of these three aspects (tension, segmentation, and macroform) hypothetically seems clear; namely, that moments of utmost tension and relaxation are coordinated with points of segmentation, facilitating the memorization of macroform. Additionally, the coherence, or agreement of these three aspects may be diminished in non-tonal music, ultimately disrupting the perception of structure, and allowing the authors to more clearly see the relationship between tension and segmentation.

While the results of Addessi and Caterina's listening study are consistent with those put forth by Deliège—in that evidence of cue abstraction was exhibited by listeners even when faced with non-tonal material—the relationship between tension and segmentation appears more complex and context-dependent.²⁸⁶ Segmentation at points of maximum tension and relaxation aligned occasionally; a result which remained consistent across both tonal and non-tonal works. The authors conclude that, regardless of tonality, listeners determine points of segmentation more according to similarity/difference than any other factor, including tension. The crucial ramification of this finding, which is easy to overlook, is that segmentation and the perception of structure appear to have no syntactic origins. That is, listeners segment according to surface similarity (contrast, discontinuity, change, and repetition) as opposed to syntax.

Within the context of the present study—translating Mozart's music to disparate styles—the finding that structural perception is not syntax- but similarity-dependent, has important consequences. It suggests that, from a perceptual perspective, structure is a more universal or abstract feature amenable to translation. Hypothetically then, a nontonal piece which contains the same surface similarity (contrast, discontinuity, change, repetition, and so forth) in the same

²⁸⁵ Addessi and Caterina, 33-34.

²⁸⁶ Addessi and Caterina, 45-46.

positioning as Mozart's own, would be perceived as having the same structure. While this hypothesis is not pursued presently, as it would entail a cognitive study requiring psychological expertise, it serves to emphasize the roles of surface and structure in musical translation. As such, the computational aspects of this study attempt to gather as many measures of the musical surface as possible through feature extraction; while more macro concerns are handled by the subsequent segmentation of features, tonal planning, and the audio waveform in general. In effect, the methodology of this study mimes the cue abstraction model, in that surface similarity leads to structure; but it does so through computational and manual analysis.

The syntactical rules present in functional tonality, like the tonic following the dominant, suggest in music theory corresponding segmentations; for example, the return of the tonic tonality marks the recapitulation section of a sonata. But in nonfunctional music, rules of syntax may be nonexistent, transient, or less-overt—leading music theorists to segment based upon other features, such as repetition, continuity, and similarity. In effect, this creates a schism of approaches in music analysis (say, between free atonality, serialism, and Renaissance polyphony); whereas perceptual analysis remains largely consistent across styles. It is also interesting to note that this positions nonfunctional music analysis a bit closer to perceptual analysis, as they both rely on analogous features for segmentation.

If the relationship between perceptual and musical analysis (or, the psychology of perception and theory of music) has thus far been presented as mostly complementary, then Addressi and Caterina's work presents an opportunity to briefly cover the more contentious debates existing between the fields. As has been stressed, music theory tends to favor larger structures and long-term relationships, while cognitive theory tends to favor more local features

which may have no music-terminology counterpart. But the heart of the debate is more related to causality, or which field should lead to the other.

The authors question if the field of psychological perception can do more than merely validate theories of musical analysis, but actually be used to generate analytical rules—reversing the relationship of the fields.²⁸⁷ Models of perception as generated by music analysts are sometimes even derided as “folk psychology” within the cognitive science community, who view validation as a diminishment of their field. Addressi and Caterina’s stance in the matter is clearly of role-reversal, as their work aims to create analytical rules from cognitive studies. Particularly in non-tonal works which lack a defined rule-system, or in extreme music such as harsh noise—which lacks even the conventional musical features handled by most theories—a perceptual model of music analysis could be highly effective. And so, the need for perceptual analysis in music is apparent, but the question of where those theories should originate remains unresolved. In the view of the present study, setting up a binary between the fields seems like a fraught affair, when one could easily imagine more of an overlapping relationship.

As Addressi and Caterina’s work on structural perception moves somewhat afield from Gestalt psychology (and thus GTTM, as well as Deliège to a lesser degree) it is interesting to consider Clarke and Krumhansl’s work on temporal perception, which not only hews closer to Gestalt theory, but to Meyer’s model as well.²⁸⁸ This is intriguing because the assumed dichotomy between rule-based and stochastic models, as discussed above, is not only pervasive in cognitive science, but computer science as well, and any work bridging that divide may be understood as highly profitable for a holistic study such as this one. As evidence of their Gestalt

²⁸⁷ Addressi and Caterina, 32.

²⁸⁸ Eric F. Clarke and Carol L. Krumhansl, “Perceiving Musical Time,” *Music Perception: An Interdisciplinary Journal* 7, No. 3. (Spring 1990): 213-251.

stance, Clarke and Krumhansl even point to the lack of an empirical component in Lerdahl and Jackendoff's GTTM as a contributing factor in their own research.²⁸⁹

Where *structural* perception concerns the apprehension of an auditory schema, *temporal* perception is a broader study, including some similar aspects like segmentation, but also distinct ones like remembered location and perceived duration. Temporal perception studies also commonly regard formal function (such as beginning, middle, and end)²⁹⁰ which necessitates listening to entire works. In fact, the formal and temporal experience of listeners when hearing a complete piece of music is an oft-neglected aspect of most other listening studies—which tend to favor short, simple excerpts.²⁹¹ Aside from practicality purposes, this is often done to reduce complexity and isolate variables. But temporal studies—including Clarke and Krumhansl's—often argue that real-world music is a highly complex stream of continuous information which must be deciphered in real-time, somewhat similar to verbal communication. Although the authors model the listening process with Gestalt approaches as opposed to stochastic ones, it is in the insistence that music is a stream of information where similarities to Meyer's information theory can easily be drawn. Concerning the criteria for grouping auditory information into “items” or Gestalt units, the authors distinctly resemble Meyer in the following definition:

The notion of “item” in music is somewhat difficult: music consists of a *continuous flow of information* [emphasis added] in which the idea of individual, discrete items must be treated with great care. It is too easy for musical notation, which indicates clearly distinguishable discrete events (notes), to be uncritically assumed to be directly equivalent to the way the music sounds.²⁹²

²⁸⁹ Clarke and Krumhansl, 214.

²⁹⁰ For more on formal function, see “The Syntax of Play” section in this study which discusses Vallieres’ “Beginnings, Middles, and Ends.”

²⁹¹ Clarke and Krumhansl, 218-222.

²⁹² Clarke and Krumhansl, 219.

Another reason many studies avoid substantial durations is that they consider it under the purview of a separate, but related field—that of (non-musical) time perception—which seeks to model how humans experience time. There are many competing theories concerning temporal perception, but two are of significant prominence: the first theory, is that humans have an internal clock, or innate sense of time, while the second is that perceived duration depends on the amount of information processed. Fine motor skills which require precise timing seem to suggest the presence of an internal clock; whereas moments of trauma, for example, are often perceived as a slowing of time due to an influx of information. The authors are of the stance that both theories do not preclude the other, and that temporal perception may be the convergent result of both processes. Uniting these various aspects in a series of experiments, Clarke and Krumhansl’s stated purpose is to “bring together the related issues of segmentation, remembered location, and perceived duration so as to gain insight into the formal and temporal experiences of listeners as they listen to a complete piece of music.”²⁹³

The authors follow a similar methodology which Deliège put forth for comparing GTTM’s grouping preference rules (that is, criteria for well-formedness) and their ensuing segmentation predictions with empirical results.²⁹⁴ In Deliège’s study, participants listened to the entirety of a musical work three times, pressing a key at segmentation points during the course of the last two hearings. As a follow-up experiment, short excerpts from the piece were played back for the subjects, who determined their original locations within the piece. Deliège’s use of an entire work is particularly noteworthy in the Gestalt sphere, and set a precedent for Clarke and Krumhansl to follow.

²⁹³ Clarke and Krumhansl, 222.

²⁹⁴ Clarke and Krumhansl, 215-217.

Using both atonal and tonal piano works (specifically, Stockhausen's *Klavierstück IX* and Mozart's *Fantasie K. 475*) Clarke and Krumhansl found strong supportive evidence consistent with Deliège and GTTM.²⁹⁵ For both works, the segmentation predictions of Lerdaahl and Jackendoff's GTTM broadly coincided with listener judgements at local and macro levels, indicating that listeners maintained consistent grouping criteria across all levels. In terms of location judgements, the authors found a striking and systematic deviation from true location modeled by a slightly S-shaped function. This means that although listeners were overall quite accurate in judging the original position of played-back excerpts, they placed events that were distal to the center more proximally, and events that were proximal to the center more distally. The authors hypothesize that this perceived slowing of time in the middle of the piece and speeding of time at the beginning and end is a product of attentional strategy common to listeners. With more focused listening occurring at either end of a work, as opposed to the middle, composers may also unconsciously construct pieces around this principle—further reinforcing listener strategies.

At this point, it seems prudent to pivot the discussion away from the perception of temporal features and toward the perception of pitched features—especially considering the emphasis on tonal planning which the current study contains. And though many music cognitive studies can be divided along this line, which is to say between pitch and time, this would be to presuppose an independence of the two which is simply not borne out by reality. Interestingly, it is the work of Krumhansl, and the subsequent work by her former students, which provides such an insight and allows the present discussion to move toward considerations of pitch.

²⁹⁵ Clarke and Krumhansl, 248-250.

The rhythmic and time-based elements of Krumhansl's work are deeply indebted to her earlier research which established "tonal hierarchies" as a perceived musical structure.²⁹⁶ Although a tonal hierarchy is a commonplace observation within the field of music theory, Krumhansl found supportive evidence that listeners truly perceive this system through her novel "probe-tone" technique. Immediately following a musical excerpt which establishes a tonality, a single pitch—or *probe-tone*—is played back for the listener, who then rates the goodness-of-fit between the tone and its preceding passage. Listeners' ratings repeatedly corresponded to music theory predictions, such that the tonic pitch received the highest rating, while the tonic triad, diatonic set, and non-diatonic set received progressively lower scores. The probe-tone technique has seen considerable variations through the years, and has been especially expanded by former students of Krumhansl, such as Mark Schmuckler.

Perhaps their most well-known concept, Krumhansl and Schmuckler's *key-finding algorithm* uses both duration and frequency-of-occurrence of the component pitches found in a musical passage to predict listeners' judgements of tonality. Building on this work in a separate collaboration, while also emphasizing a Gestalt-based perspective, Schmuckler's work with Nicholas Smith stresses the importance of *differentiation* and *organization* as underlying processes to the perception of functional tonality.²⁹⁷ Differentiation entails the segregation of individual elements into groups according to perceived differences, while organization establishes relationships between the elements within each group. Together they form a complementary perceptual process which Smith and Schmuckler believe listeners apply to pitch content in order to build a mental schema of tonality.

²⁹⁶ Nicholas A. Smith and Mark A. Schmuckler, "The Perception of Tonal Structure Through the Differentiation and Organization of Pitches," *Journal of Experimental Psychology: Human Perception and Performance* 30, no. 2 (April 2004): 268-269.

²⁹⁷ Smith and Schmuckler, 269-270.

By systematically altering duration and frequency-of-occurrence of specific pitches, the authors created a variable degree of tonal strength, and found that listeners' prediction accuracy corresponded strongly to tonal strength.²⁹⁸ When passages contained more frequent and proportionally longer uses of diatonic material (and especially the tonic or tonic triad) participants were able to predict tonality more accurately. This indicates that listeners use both duration and frequency-of-occurrence to reliably differentiate pitches and organize them into a tonal hierarchy. In passages without adequate duration and frequency-of-occurrence to reinforce the tonic, even entirely diatonic material exhibited weak tonal strength. Significantly, this suggests that the perception of tonality requires sufficient coherence between pitch and rhythmic material, such that tonally significant pitches are also proportionally favored.

* * *

The notion of the trained listener, and how musical training and stylistic knowledge affect the listening experience, is the source of considerable debate. This is undoubtedly due to the implication that there is a “correct” way to listen, as it conjures up self-serious, or even elitist, approaches to musical appreciation. But given that the various approaches covered in the present work (music theory, musicology, psychology, and aesthetics) all produce different musical meanings, the possibility that some meaning is lost on a listener seems to be more of a certainty. To have the full picture would require theories and perspectives as yet undiscovered, and so may be regarded as an impossibility. All that said, the line of cognitive studies thus far covered—extending from Deliège through Addessi and Caterina, Clarke and Krumhansl, Vallieres, and Smith and Schmuckler—has remained mostly unbroken, with Gestalt-based approaches throughout. But the following studies introduce biological and functionalist perspectives on

²⁹⁸ Smith and Schmuckler, 281-283.

perception, and so are not quite opposed to Gestalt thinking, as much as they are vastly different in approach.

Searching for the universal in music has a long history, and much of that pursuit attempts to connect music with its auditory-human counterpart, speech. The function of speech from an evolutionary or biological perspective is quite clear, in that it communicates information and emotion efficiently. But while music, or “sound communication outside the scope of spoken language” can be observed across all human cultures, its function remains more shadowy.²⁹⁹ In a growing number of recent studies, empirical evidence has consistently supported the claim that “emotional expression in music and the voice is acoustically similar with respect to tempo, intensity, timbre, pitch register, and voice onsets/tone attacks.”³⁰⁰ But tonality, or a set of tones and their relationships, has largely been considered a purely musical construct better-suited for the music theorist than the psychologist or biologist.

Daniel Bowling’s study suggests that the emotional responses to the major/minor pitch collections throughout world cultures is analogous to the corresponding speech patterns during happy/sad emotional states.³⁰¹ Drawing from the hypothesis that sounds in a natural environment were historically dominated by human speech, the author’s research suggests that musical response is an association to speech response. Following anatomical studies of the human voice, four experiments involving the analysis of database recordings (of both human speech and cross-cultural music) were designed. Spectral analysis, intervallic content, MRI, and animal studies allowed for strong logical support to the statistical conclusions found. Pitch content was found to co-vary with emotional state across Chinese, Japanese, and Indian cultures as well as Western

²⁹⁹ Daniel Liu Bowling, “The Biological Basis of Emotion in Musical Tonality” (PhD diss., Duke University, 2012): 2.

³⁰⁰ Bowling, 118.

³⁰¹ Bowling, 103.

ones. While other musical elements such as rhythm, volume, and amplitude envelope have long been viewed as biologically-based, Bowling's research advocates for tonality's rightful inclusion as a biological analog.

Bowling's work supports the present study in that tonal planning can be considered a translatable, or universal concept not bound to the particulars of the Western classical style. Since tonality and affective response appear to be correlated across disparate styles and cultures, Mozart's tonal plans emerge as a significant factor in musical translation and musical meaning. But aside from tonality itself, tonal planning inherently introduces modulation, or the shifting of tonal center as a piece progresses. While modulation is understood to have great structural and developmental significance within music theory, "the scientific evidence bearing on affective responses to modulation is scarce and indirect"³⁰²—a gap which Marina Korsakova-Kreyn addresses in her perceptual studies.

Korsakova-Kreyn's research suggests that degree, direction, and modality of modulation significantly influence the listener's affective response.³⁰³ Direction of modulation refers to clockwise or counterclockwise movement in terms of the circle of fifths, while proximity between keys refers to the number of steps between each tonal center. In the first experiment, all twelve possible modulations in the four different major-minor differentiations were played for subjects, who successfully differentiated the dominant and subdominant as well as tritone and minor seventh modulations. In the second experiment, modulations were limited to the dominant, subdominant, and minor sixth degree, while direction of movement was varied. Modality, or major/minor, was found to be a significant factor in the happy/sad emotional responses of

³⁰² Marina Korsakova-Kreyn, "Affective Response to Tonal Modulation" (PhD diss., The University of Texas at Dallas, 2009): 4.

³⁰³ Korsakova-Kreyn, 79.

participants. Clockwise circle of fifth movement was subsequently found to raise tension while counterclockwise movement to subdue it, thus making movement to the dominant stronger than to the subdominant. Distant movement, such as to the tritone, was found to be tenser but less forceful.

Korsakova-Kreyn argues that just as Leonard Meyer emphasizes listener expectation, the “interplay of tonal tension and resolution” in modulation generates an emotional response which is not only continuously unfolding, but specific to the degree, direction, and modality of the modulation.³⁰⁴ While temporally distant modulations (that is, ones separated by long spans of time and numerous modulations) are not explored, Korsakova-Kreyn’s work supports the perceptual significance of tonal planning at least as far as adjacent tonalities, showing how listeners respond to the relationship between keys in particular. Stepping back, the combined consideration of Bowling and Korsakova-Kreyn lends credence to the argument that tonality, and modulations thereof, produce affective responses in listeners at least partly due to some innate, biological basis. And for the present work, this more generally supports the stance that tonal planning is perceptible, meaningful, and sufficiently universal, so as to be translated into disparate styles.

* * *

Underlying many perceptual and cognitive studies is the notion of value, and so while many of the previous sources do not address value in a direct or empirical sense, they do offer a clear interface with philosophy, or more specifically, aesthetics. Whether there is a correspondence between what is perceptible and what carries meaning or value is the topic of continued and potentially interminable debate; and thus, is quite often left to the field of

³⁰⁴ Korsakova-Kreyn, 87.

aesthetics alone. Especially in discussions of atonality, the question of perception is almost invariably raised, and whether musical meaning which fails to be recognized by the listener—here by the supposed psychological or even physiological inability to discern the tone row and its variants—results in a deficient musical experience. In short, the question is whether the loss of musical meaning can cause an analogous loss in aesthetic value. This is of interest to the present work in musical translation, as the act itself necessitates heavy engagement with meaning and an implied appraisal of what carries value. For example, even the above argument for the significance of tonal planning, which claims that the perceptible and universal qualities of tonal planning make it amenable to translation, contains some implication that to be perceived is also to hold value.

While the present work does not attempt any resolution of the questions surrounding aesthetic value, it seems prudent at this moment to make a brief detour and address such concerns in a more direct manner. Walter Horn's article on tonality, musical form, and aesthetic value is perhaps the best-suited work for these purposes, as it makes a strong argument for the "unheard" in music—whether in tonal or atonal works.³⁰⁵ Horn begins by investigating definitions of music, structure, and aesthetic value as a means of orienting the discussion. While tonality is a set of pitches and their relationships, and form is syntactical in nature (the arrangement of objects whether on local or macro levels)—aesthetic value enjoys no similar consensus. Horn advocates for viewing aesthetic value as a characteristic or category which is known to exist, even if currently ill-defined; stating, "although we may not know whether its assignment is objective or subjective, we do understand that it is something that musical and

³⁰⁵ Walter Horn, "Tonality, Musical Form, and Aesthetic Value," *Perspectives of New Music* 53, no. 2 (Summer 2015): 201-235.

other objects of art or nature seem to us to have more or less of.”³⁰⁶ The definition of value here is intentionally vague, or akin to a black-box approach, but it does allow the discussion to move forward into the question of atonal works.

Even making the hypothetical assumption that all listeners cannot detect atonal events, while they can detect tonal ones, it remains unproven that comprehensibility ensures a piece’s worth. If a work is abundantly meaningful, which is also to say that it communicates a great deal of information, and the listener is furthermore able to comprehend this transmission, there is no reason to believe this makes the piece better. A phonebook, for instance, is full of information and readily understandable, but few would argue that it has more aesthetic value than a respected book. But this is not to say that intentionality, or conception, ensures worth either, as the sound of a river or a piece of aleatoric music may also be of profuse aesthetic value. This valorizing of intentionality is otherwise known through Richard Taruskin as the *poietic fallacy*, or “the conviction that what matters most (or more strongly yet, that all that matters) in a work of art is the making of it, the maker’s input.”³⁰⁷

Horn works from Taruskin’s *poietic fallacy*, arguing that intentional aspects of tonal works—such as the choice of key—may be unheard or un-hearable in themselves, but that their consequences may be easily identified in terms of instrumentation ranges, acoustics, tessitura, and so on. In short, intentional choices concerning imperceptible features may still have other, perceptible consequences. Intentional choices may also have various unintended consequences; and so, the notion that intentionality, perceptibility, and value guarantee each other, and are more extant in tonal works than atonal ones, appears false.³⁰⁸ Horn’s conclusion that unheard features

³⁰⁶ Horn, 205-206.

³⁰⁷ Richard Taruskin, “The Poietic Fallacy,” *The Musical Times* 145, no. 1886 (Spring 2004): 10.

³⁰⁸ Horn, 224.

cannot be disproven as contributors to perceived ones, regardless of tonality, is significant to the present research in that it prompts musical translation to be holistic: the worth of any given musical characteristic cannot be determined by intentionality or perceptibility alone.

While the above discussion presented Horn's work as a pivot from cognitive studies to aesthetics, what remained constant was the emphasis on the listener's experience in particular. But in the conventional chain of music, three main participants are typically involved: the composer, performer, and listener. Of course, these roles are not rigid, as they can be combined together—such as in jazz improvisation—or even supplemented, such as by the role of critic. But even without three separate individuals occupying discrete roles, it can be useful to consider the roles more as processes: the composer conceives, the performer enacts, and the listener experiences. These roles/processes are more universal aspects of music-making, as they are less anchored to Western notions of music. Within this paradigm, the field of music theory can be understood as foregrounding the composer/conception, and cognitive studies as foregrounding the listener/experience; but this leaves the performer/enaction mostly neglected. The research of Patrik Juslin emphasizes that while the performance is a physical manifestation of both the composer's and performer's intentions, the listener's experience is influenced greatly—if not primarily—by the properties of sounds produced by the performer.³⁰⁹ Interpretation is the performer's domain, and objective properties of performance are strongly related, but commonly overlooked, in the subjective experience of the listener.

Emotion and nonverbal communication studies, such as Juslin's, frequently employed the theory of *functionalism* in the last two decades of the twentieth century. The theorem holds that biological evolution is not limited to physical adaptations alone, but applicable to any number of

³⁰⁹ Patrik N. Juslin, "Emotional Communication in Music Performance: A Functionalist Perspective and Some Data," *Music Perception: An Interdisciplinary Journal* 14, no. 4 (Summer 1997): 384.

anthropological concerns, such as psychological phenomena.³¹⁰ Not all behavior can be considered adaptive, but nonverbal communication likely played a critical role in early human society, where both the timely expression and recognition of emotion held evolutionary value. Furthermore, infants continue to rely on communicative behavior throughout early stages of development—a time when they are also physically most vulnerable. Pairing functionalism with another theory, the existence of a small set of *basic emotions* (such as anger, sadness, happiness, and fear), nonverbal communication would have an evolutionary function as an efficient means of processing emotion. The functionalist perspective when applied to music performance is not concerned with music's explicit function however, but with how it connects to the shared language of nonverbal communication. Juslin outlines his hypothesis as follows: “performers, at least to some extent, can capitalize on a general nonverbal code when they communicate iconic representations of basic emotions to listeners.”³¹¹

In the functionalist perspective, properties of a performance such as tempo, amplitude, articulation, attack, and timbre could be functionally valid expression cues for a listener. By emphasizing or altering certain cues, performers would theoretically be leveraging the nonverbal code universal to humans, while listeners would then be decoding these cues to recognize emotional expression. To test this, Juslin's experiment instructs performers to play the same melody successively, each time expressing a different basic emotion (anger, happiness, sadness, fear, and no emotion). In a paired listening experiment, participants subsequently rate these performances according to perceived emotional expression.³¹²

³¹⁰ Juslin, 385-387.

³¹¹ Juslin, 388.

³¹² Juslin, 395-397.

Juslin's results suggest that, independent of the written music, the communication of emotion can be fundamentally altered by changes in performance features, and that listeners can effectively decode these cues to accurately identify emotional expression.³¹³ In other words, performers were able to express different emotions using the same piece of music. Cues were observed to be altered systematically such that no specific cue was correlated to a specific emotion. Since the cues were also intercorrelated, Juslin concludes that redundancy in the communicative process could be a likely method for combating uncertainty in listener decoding. Regardless of specifics, Juslin's emphasis of the performer's role is more salient to the present research than the various tenets of functionalism or basic emotions; as it implies that merely choosing a different performance/recording may radically alter emotional expression. The use of computer analysis must therefore be understood foremost as a representation of a particular recording, as opposed to the score itself. Furthermore, the choice of recording becomes a significant variable in the research process, necessitating proper discussion and justification within the Methodology section.

At various points, the present study has considered music through the lens of domain; or more specifically, the score, physical, and cognitive domains. Each perspective allows for different musical meanings to emerge, as well as offering a way to organize sources—Juslin's emphasis of the performer may thus be understood as an aspect of the physical domain. The work of Gregory Sullo continues this consideration of the physical domain, and is a highly insightful study on how social and economic factors influence performance spaces; and furthermore, how the acoustics of those spaces go on to influence musical style.³¹⁴ Connecting social forces with musical styles via the physical structuring of musical venues, Sullo asserts that

³¹³ Juslin, 412-415.

³¹⁴ Gregory B. Sullo, "The Structuring of Musical Perception" (Master's thesis, Illinois State University, 2017).

performance spaces for music are more strongly influenced by political, social, and economic factors than artistic ones; and therefore, the acoustics available to composers throughout history represent a direct extra-musical influence on style largely unconsidered in existing scholarship.³¹⁵

But to be clear, Sullo is not engaging in a sort of acoustical determinism, where acoustics alone *cause* style, he is instead arguing that there is an influence, or *correlation* between the two.³¹⁶ Sullo examines the Western tradition's performance spaces, noting that beginning in the seventeenth century, composers advantageously filled small rooms with dense Baroque counterpoint previously impossible in cavernous Medieval churches.³¹⁷ The rooms (chambers and ballrooms of the nobility) were intimate, with small audiences and ensembles, while the acoustics were also quite dry, meaning they had few echoes, or reflections. As the Baroque gave way to the classical, and the rising bourgeoisie contributed to larger audiences and ensembles in the eighteenth century, the advent of dedicated public opera houses and concert halls was prompted, which acoustically were positioned somewhere between the dry Baroque and reverberant Medieval spaces.³¹⁸ The music itself, appropriately enough, also became a negotiation between Medieval monophony and Baroque polyphony: known as the Classical homophonic texture—with its moderate density, instrumental doubling, foreground melody, and so forth—the new style perfectly suited the new spaces.

Sullo's discussion repeatedly draws attention to the social forces underlying where music is performed, and in what style—often showing how the same forces created both the space, and

³¹⁵ Sullo, 1-4.

³¹⁶ Sullo, 9, 11.

³¹⁷ Sullo, 13.

³¹⁸ Sullo, 14-16.

the music for that space.³¹⁹ The growth of secular music in the Baroque took place in the court, not the church; and later, the growth of the bourgeoisie in the classical era took place in public music venues, not the rarified air of the court. Aside from shifting spheres of power, the Enlightenment, with its desire to uncover truths of the objective world, breathed new life into the study of music theory. And not only did such study seek to valorize the aesthetics of classical music itself, but Sullo sees the new concert halls as intentional monuments to both Enlightenment ideals in general and the bourgeoisie in particular. The field of acoustics is very often viewed as a technical matter pertaining to audio engineers and architects alone, but Sullo makes a persuasive case for the social, economic, and political factors which shape venues and influence musical styles.

³¹⁹ Sullo, 21-25.

CHAPTER 5: MUSIC THEORY AND THE DIGITAL

Methodology / Music Information Retrieval

All the preceding sections, while not under “Methodology” in proper, nevertheless engage with and contextualize the computational analysis which will be described in this section. In a broad sense, the humanities have always engaged with technology for information retrieval. The medium of such information has long been borne by analog forms, such as printed sources and vinyl records, but the increasing presence of digital media has fundamentally changed how information is gathered, stored, and distributed. And while one important aspect of digital technology is as a tool (digital archives, searchable databases, machine learning, and so on) Svensson argues that the digital can be considered more of a liminal space, or even a medium of information in its own right. He states that the digital

is an integral part of life in large parts of the world, an increasing amount of material is digital, and digital media offer expressive potential... Since digital technology is interwoven into our daily lives, expressive modalities, corporate structures, and societal concerns, it is a powerful intersecting property and a boundary object.³²⁰

The term *digital humanities* has thus evolved to describe both the interface between the humanities and the digital, as well as acknowledging the unique properties of the digital medium itself. The computational portion of the present research falls squarely under the digital humanities umbrella, as the desire is not to use technology solely as a tool, but to leverage it as a new medium or lens through which to perceive musical analysis. As will be elaborated throughout the following section, forcing technology into alignment with human or analog concepts often reduces the natural capacity for computers to work idiomatically. While

³²⁰ Patrik Svensson, *Big Digital Humanities: Imagining a Meeting Place for the Humanities and the Digital* (Ann Arbor: University of Michigan Press, 2016): 9.

identification of conventional musical elements (melody, harmony, rhythm etc.) is a relatively straightforward task for someone familiar with score analysis, computers often struggle with these same tasks while excelling at others which have no counterpart in traditional terms. Embracing these digital-specific terms as novel musical features which can be utilized in analysis is a core aspect of the present research. Furthermore, this constitutes the final thread of the multivalent approach assumed across the entirety of this work; or more specifically, the digital component of the present section has been preceded by theoretical, musicological, aesthetic, and cognitive components which together attempt a holistic view of operatic analysis.

Of particular relevance to the present work is Tuomas Eerola's study which uses computational feature extraction and psychological modelling to analyze music.³²¹ Studies based on music and emotion, especially computational ones, tend to use musical materials that are purpose-built, so as to reduce variables through simplistic examples. On the other hand, huge swaths of real-world data can be covered through machine learning studies—but again, this is done for the purposes of abstraction in order to glean general principles. Very few (if any) computational studies focus on a single piece, such as is common in the field of music theory. Eerola seeks to address this gap through his study on computational feature extraction and emotional arousal in relation to Schubert's *Der Erlkönig*.³²² Aside from analyzing a specific work, Eerola's use of low-level features (as opposed to extrapolating out to high-level features) sets a novel groundwork which this study follows.

Musical features can be divided into two categories, structure and performance, based on whether they are dictated by the score or performer. While a performer can alter features like

³²¹ Tuomas Eerola, "Analysing Emotions in Schubert's *Erlkönig*: A Computational Approach," *Music Analysis* 29, no. 1/3 (March-October 2010): 214-233.

³²² Eerola, 214.

dynamics, rubato, or phrasing for expressive purposes; the work itself continues to exhibit an unchanging formal structure through features like melody, harmony, and rhythm. Studies usually address features belonging to the same category, but regardless of that choice, there are still a huge number of features to consider. Furthermore, the simultaneous and independent change of multiple features, as is commonplace in real-world music, creates a virtually infinite array of feature combinations. So while the isolation of particular features initially appears attractive, its utility in terms of understanding the relationship of music and emotion is prohibitively narrow. A correlative approach—as used by Eerola—can bypass this logical conundrum by correlating the results of computational feature extraction to the scoring given by human participants.

But aside from the sheer presence of musical features, there is also the related question of what processes them. The processor itself can be highly influential, given that the two, conventional ones—humans and computers—process audio signals differently. Though this could presently lead to a potentially lengthy discussion on the dubious nature of binaries, the apparent omission of how “nature” processes music, and the various tenets of post-humanist theory—the general understanding remains true that the method of processing is a significant influencer on musical perception. And in cases where computers play a primary role in analysis or processing, the translatability from computer to human experience needs to be addressed.

At first, this appears to be a rather modern concern brought about only by the advent of computers, and perhaps remotely by those pre-digital naturalists studying animal musical perception. But this overlooks the fact that human processing (that is, listening) can take on many forms. First, there are questions of attentiveness, familiarity, preference, and expertise. There are also temporal aspects, such as real-time listening compared to stored memories. Memory, furthermore, can take many forms, as one could remember the visuals of the score or a

lecture given quite independently to the music itself. This is not to even mention the influence of venue, popular opinion, listening experience, and listener mood (that is, current mood apart from the music). The various factors involved in human listening and music perception may include innumerable other factors accounting for individual and cultural differences, necessitating the concept of “translation” in virtually any discussion, regardless of the use of computers.

Music information retrieval (MIR) is a fairly broad term covering any use of computer processing in music analysis. MIR may be executed either in the “engineering” approach, which does not account for the human factor; or in the “cognitive” approach, which attempts to emulate the human listening process.³²³ With regards to an audio signal, computers naturally excel in identifying properties of timbre or spectrum; while they underperform in properties related to specific notes, such as pitch, chord, and note onset. In general, computers fare better in aggregate, as opposed to isolated, properties. For this reason, computer analysis of the score, or notated data, can present a serious advantage, but many forms of music do not use comprehensive scores, if any. Due to the lack of available scores and need for large data sets, many studies opt to use audio analysis alone—a process which often begins with “feature extraction.” In feature extraction, various mathematical transformations are applied to the data to produce these features, many of which only roughly correspond to conventional musical terms. By filtering the audio prior to feature extraction, researchers can somewhat approximate the faculties of human hearing in the so-called “cognitive” approach which accounts for hearing range, pitch sensitivity, and amplitude perception of the human ear. Common features and their music theory equivalents are given by Eerola, and included below.³²⁴

³²³ Eerola, 215.

³²⁴ Eerola, 217.

Figure 5.1. Feature extraction and music theory equivalents

Dynamics

- *RMS*—root mean square energy; an overall measure of amplitude in dB
- *Low energy rate*—percentage of frames with below-average energy

Timbre

- *Spectral centroid*—geometric center of the spectrum; e.g., higher values are “brighter”
- *Spectral spread*—overall variance of the spectrum
- *Spectral flatness*—smoothness of the spectrum

Harmony

- *Harmonic change*—amount of change of the tonal centroid
- *Key clarity*—maximum correlation to known key profiles
- *Majorness*—degree of fit to major versus minor modes

Register

- *Salient pitch*—typical pitch in a given segment; in Hz or semitones

Rhythm

- *Tempo*—beats per minute found from correlation with amplitude envelope
- *Pulse clarity*—clarity and stability of the defined pulse
- *Fluctuation strength*—characterization of the typical rhythmic patterns

Articulation

- *Attack time*—duration between note onset and peak
- *Event density*—number of note onsets per second

Structure

- *Novelty*—degree of repetition of any given feature; found by self-similarity matrices

To link the above features to emotional expression, Eerola created a computer model which correlated features with user-generated values of emotion. Rather than training the model on a dataset of Lied examples, a previous model based on film music was used. In that study, Eerola chose 110 musical excerpts from film music “to represent the five basic emotional categories: Happiness, Sadness, Tenderness, Anger and Fear. MIR feature extraction was correlated with ratings by a large number [of participants] who appraised the passages according to a three-dimensional model of valence, energy (activation) and tension.”³²⁵ The resulting model revealed

³²⁵ Eerola, 219-220.

which features were more strongly associated with specific emotions, and could also predict emotional expression when given a set of features; for instance,

Sadness is a combination of a positive amount of spectral spread and a positive amount of tonal repetition with a negative amount of “majorness” and registral and harmonic change...In simple terms, it could be said that the model is seeking music which has a rich timbre, slowly changing key centres and a stable, unchanging register, and is in a minor key.³²⁶

Furthermore, each emotion could be independently and simultaneously varied, such that a given passage could express a mixture of multiple emotions, much like RGB values in a visual display.

Eerola notes that the result is “a more pluralistic model of emotions, where separate, distinct emotions can occur simultaneously in differing intensities. Rather than the song’s segments outlining a monolithic succession of single affects, each segment constitutes a distinctive blend of various emotions.”³²⁷

Eerola segmented *Erlkönig* into five sections based upon contrasting emotional character and formal outlines drawn from existing literature.³²⁸ Each section was given a predicted emotion, or set of emotions, before applying feature extraction. The results of the feature extraction were then sent to the previously-generated film music model, which mapped the features onto emotional states. Eerola’s findings were mixed, partly due to the musical differences between Lied and film music. In particular, the conventional use of low pitches to express Anger in film music had no analog in the piano-voice ensemble, which—by nature of instrumentation alone—has comparatively much less low-range capabilities. This led the model to inaccurately identify Anger in the Lied, both marking it when seemingly absent, and missing it when present. The other cited issue was textural. Since the film music examples rarely featured a

³²⁶ Eerola, 220.

³²⁷ Eerola, 225.

³²⁸ Eerola, 222-225.

foreground melody, and never featured voice, the model diminished the importance of prominent melody when examining *Erlkönig*, and therefore appeared much less sensitive to the vocal line than human listeners.

It should be noted that despite the aforementioned inaccuracies brought about by a mismatch of genre and instrumentation, the model performed remarkably well; perhaps reflecting the similarities between Romantic and film music. Eerola's work may falter somewhat in execution, but it sets a strong precedent for the use of low-level features in the context of music analysis. The identification of absolute emotional states is not a concern of the present study, but the application of feature extraction to a specific, and segmented work is shared.

Eerola's study of *Erlkönig* is specifically a music and emotion study, but more generally, it is a part of the music perception subfield of psychology, which broadly seeks to understand the musical listening process. While the present research does not dispute the substantial importance of emotional meaning in music, the current nature of emotion studies is highly theoretical due to the difficulty of quantifying and understanding emotion itself. This makes it more appropriate for focused and experimental research within the field, where the uncertainty of the topic is naturally assumed. For this reason, the present study tends much more toward general music perception than music and emotion, a point which is justified by the following discussion.

In an extensive review of 251 music and emotion studies, Eerola and Vuoskoski found a significant degree of confusion and inconsistency in the field. Despite the proliferation of contemporary studies at the intersection of music cognition, music psychology, and neuroscience of music, there has not yet been "a set of coherent findings, since large discrepancies exist concerning exactly what is being studied."³²⁹ The authors' endeavor is thus also marked by a

³²⁹ Eerola and Vuoskoski, 307.

desire to promote organized thought and common understanding across the field. Within the context of the present study, two points of discussion are relevant (emotional models and locus of emotion) as they provide clarifications which will be discussed below.

Emotional models are typically divided into two main types: discrete and dimensional.³³⁰ Discrete models operate on the theory that all emotions are derived from a finite set of basic emotions, such as fear, anger, disgust, sadness, and happiness. Alternatively, dimensional models theorize that all emotions are a mixture of basic attributes which are continuous in nature, such as valence and arousal. Valence is typically defined as a measure of pleasantness while arousal is a measure of energy, and both are famously oriented orthogonally in the circumplex model, which is essentially an affective coordinate plane.

While emotional models are centered on the listener, the term *locus of emotion* refers to whether emotion is located internally or externally to the listener; that is, whether the listener actually experiences the emotion or simply recognizes it in the music.³³¹ Though equivalence between felt and perceived emotion is common, there are also instances when the two are significantly opposed; and so, they must be evaluated separately. An overly happy section of a piece which is otherwise quite sad, for example, may induce disparate feelings in the listener despite what is nominally being expressed. In the studies reviewed by Eerola and Vuoskoski, locus of emotion was very frequently unclear, vaguely defined, or used in conflicting ways—resulting in questionable data. Furthermore, the evaluation of emotion was often based on a single method alone, such as self-reporting, researcher observation, or biomedical observation.

³³⁰ Eerola and Vuoskoski, 309-310.

³³¹ Eerola and Vuoskoski, 310.

The authors stress that these methods are most accurate when used simultaneously, and in tandem with a clearly defined locus of emotion.³³²

What Eerola and Vuoskoski's review illuminates, on an abstract level, is that implicit to many seemingly objective music and emotion studies, is a host of subjective assumptions regarding emotion. For even if emotional models and locus of emotion are left undefined, their very use aligns a study with competing philosophical and aesthetic stances. In the case of music and emotion studies, psychology and philosophy are thus truly entangled—the quantitative is predicated by qualitative judgements. For the present study, this observation provides a point of departure into the philosophical and aesthetic considerations of music listening, and allows the question of musical meaning (a general goal of this study) to be addressed not so much at an additional angle, but more so at a deeper level.

Background: MIR and Feature Extraction

As previously mentioned, Eerola's analysis³³³ provides a basic model for the feature extraction components of this research. The present discussion seeks to cover feature extraction more thoroughly, providing background before describing the software and methods used to achieve these ends. Alexander Lerch's excellent text covering audio analysis is used for background material.³³⁴ In the interest of maintaining an intersectional position for the present research, a basic knowledge of computer science is not assumed for the readership, and so the various terms and definitions drawn from Lerch's work are discussed below.

³³² Eerola and Vuoskoski, 325.

³³³ Eerola, "Analysing Emotions in Schubert's *Erlkönig*."

³³⁴ Alexander Lerch, *An Introduction to Audio Content Analysis: Applications in Signal Processing and Music Informatics* (Hoboken, NJ: Wiley, 2012).

Focusing on the audio signal—as opposed to notated scores, MIDI data, lyrics, and so on—Lerch places *audio content analysis* (ACA) as a subset of *music information retrieval* (MIR) in general.³³⁵ For an audio signal to be converted to meaningful metadata, a generic two-stage process for ACA typically involves *feature extraction* followed by *interpretation*.³³⁶ Since the raw audio signal itself contains a cumbersome amount of data (usually 44,100 samples per second), it must first be dimensionally reduced, or represented through fewer values, which describe longer blocks of time. These values are referred to as *features*, but Lerch points out that “the term feature is not very clearly defined but is used for any lower dimensional representation of the audio signal to be interpreted. Features can be used to compute a result but can also be used to calculate derived, more meaningful features.”³³⁷

As Lerch implies, features can be understood hierarchically, where low-level features must be further derived in order to become “humanly interpretable” high-level features, such as tempo or pitch. The two levels of features thus seem conceptually distinct, but in practice, some low-level features require no extra processing, or interpretation, to be understood. Lerch elaborates that this second stage,

takes the extracted feature data and attempts to map it into a domain both usable and comprehensible. Thus, it turns the low-level feature data into a high-level feature and meaningful meta data, respectively... Since there is no clear objective distinction between low-level features and high-level features, it is sometimes a context-dependent decision whether the system output is referred to as low-level or high-level description.³³⁸

Distinctions of feature level aside, it bears noting that all such calculations occur within the digital domain, and so must first be preceded by analog-to-digital conversion. An audio signal is a continuously-varying sound pressure level which occurs through time. A microphone

³³⁵ Lerch, 2.

³³⁶ Lerch, 4.

³³⁷ Lerch, 5.

³³⁸ Lerch, 5.

converts this continuous pressure level to a continuous voltage level, which can then be transmitted through cables to audio speakers, which finally convert the voltage level back to sound pressure. This pathway maintains a continuous, or analog signal, throughout—but computers operate in the digital domain—and so must discretize the signal with regards to both amplitude and time. The discretization of amplitude is known as *quantization* while that of time is known as *sampling*.³³⁹ A standard of quality still commonly used is that of the compact disc (CD) which conventionally supports 44,100 samples per second and 16 bits per sample (44.1 kHz, 16-bit). Once discretized, the digital signal can be handled by the computer through myriad methods known as digital signal processing—of which feature extraction is but one type.

Signal processing is a vast and somewhat complex affair which is covered in many texts, including Lerch, so there is no need to fully reiterate it here. However, the relationship between the time and frequency domains (mediated most famously by the Fourier transform) is of such great importance to audio analysis that it must be briefly discussed. The various forms of the Fourier transform differ with regard to signal type, computational efficiency, and so on, but they all essentially convert a signal between the time and frequency domains.³⁴⁰ For example, if a violin sustains a single pitch, then the fundamental pitch and its attendant overtones will together form a complex wave which varies in amplitude through time. But in the frequency domain, the x-axis no longer represents time but frequency, and so each of the constituent pitches (that is, the fundamental and its overtones) will appear as individual peaks of varying intensity. The result is a graph which shows the pitch spectrum at a given instant, and is a powerful descriptor of timbre used in many features. The Fourier transform is possible because periodic signals can be represented by a collection of sinusoidal components in varying intensities; but this principle

³³⁹ Lerch, 9.

³⁴⁰ Lerch, 20, 32.

does not apply to aperiodic, or noise, signals. Instead, various statistical methods can be used for describing the dispersion of a noise signal—such as the probability density function—which plots the probability of all possible amplitude levels.³⁴¹ Noise is not a fleeting occurrence, but an essentially ubiquitous part of real-world audio signals, and so must also be considered alongside the periodic components when digitizing a signal.

It should be apparent from the above discussion that ACA can potentially require serious expertise, and this is only compounded by the fact that computer programming experience is often required for specific applications. But thankfully, there are a growing number of frameworks and software applications available for either less-experienced users, or more general applications of audio analysis, and Lerch provides a list of recommended options.³⁴² For this study, two of these applications (jMIR and Sonic Visualizer) were chosen for both their ease-of-use and robust features; they are discussed separately below. As these applications fully met the needs of the study, there was no need to develop any additional, or custom tools for this research.

jMIR is a suite of open-source software tools developed by Cory McKay.³⁴³ Designed to be accessible for both computer science and music researchers alike, the suite is composed of various components, or modules, which can be used separately or linked together.³⁴⁴ The general-purpose and yet robust nature of the toolkit—along with its intended accessibility for musicologists, music theorists, and music psychologists—makes jMIR an ideal choice for the present study. In particular, the jAudio component proved to be a very powerful feature extractor capable of handling the large number of calculations for each full-length opera. McKay

³⁴¹ Lerch, 13.

³⁴² Lerch, 203.

³⁴³ Cory McKay, “Automatic Music Classification with jMIR” (PhD diss., McGill University, 2010).

³⁴⁴ McKay, 17-19.

elaborates on his intended purpose, stating “in order to have as diverse a range of applications as possible, jMIR is very purposefully not tied to any particular type of music classification...It is hoped that providing music researchers with sophisticated empirical tools for studying music in traditionally unorthodox ways will help them to glean important new insights into music.”³⁴⁵

Note that McKay’s use of the term “music classification” applies not only to macro-level categories like genre or composer, but also to lower-level ones like structural divisions or pitch. Essentially, classification is used here to refer to any computer-based learning which categorizes instances according to an existing class structure. This is in contrast to “similarity” which requires no pre-existing structure, and instead uses relative, or comparative, measures.

The distinction between classification and similarity is sometimes blurred, but it informs a large part of McKay’s work as well as indirectly influencing the present study, and so merits discussion. McKay sees the difference as fundamentally *a priori* in nature; classification categorizes each instance into a pre-existing structure, whereas similarity measures the degree of closeness between separate instances.³⁴⁶ A conventional example for classification would be categorizing the genre of a song, while that of similarity would be in next-song recommendation or playlist generation. But McKay notes that nearly every task can be approached with either method, and that many of their methodologies overlap. Often, the features used are identical, and only the learning stage is altered—with classification favoring supervised learning and similarity favoring unsupervised learning. This should be unsurprising, given that supervised learning requires training data which has labelled inputs and outputs, while unsupervised learning does not require such labels.

³⁴⁵ McKay, 18-19.

³⁴⁶ McKay, 50-51.

McKay observes that the industry’s focus has been shifting away from classification-based approaches (such as the learning components of jMIR) in favor of similarity-based approaches, due to a prevailing belief that similarity relies less heavily upon “ground truth” assumptions.³⁴⁷ Ground truths are an important aspect of machine learning, and they are generally defined as that which is known to be true in the real world—that is, outside of the machine learning system. But ground truths can be difficult to define in musical applications due to the inherent subjectivity and ambiguity involved in even ostensibly simple cases, such as genre. And though this seemingly provides enough justification for favoring similarity, McKay argues that this logic is flawed, since similarity has an equal—if not greater—reliance upon ground-truths than classification. Specifically, McKay states that these problems arise “in objectively and consistently evaluating the quality of similarity measurements.”³⁴⁸ In other words, the results must still be compared against a ground truth in order to evaluate performance of the system; and so, ground truth considerations alone are not a valid reason to choose one approach over the other.

One good criterion for choosing between classification and similarity is whether the data to be analyzed is amenable to labelling. For example, if a classifier is trained to recognize the work of a particular composer, then it could potentially be used to verify works of unknown authorship.³⁴⁹ The use of a classifier is appropriate here because the class—composer—is one of clear delineation, and the task is not of comparison (e.g., how similar is Mozart to Haydn) but of identification. Furthermore, classifiers can be trained for innumerable other recognition tasks, detecting characteristics associated with particular time periods, regions, styles, and so forth.

³⁴⁷ McKay, 51-52.

³⁴⁸ McKay, 54.

³⁴⁹ McKay, 49.

Machine learning, regardless of the various pros and cons between classification and similarity or supervised and unsupervised, has also emerged as a promising model for human cognition. It can promote a listener-centric approach to understanding musical meaning by providing evaluative measures for psychological and philosophical models. McKay adds that this data can be used “to support sociological and psychological research into how humans construct the notion of musical similarity and form musical groupings.”³⁵⁰ Research often treats music as an unchanging object with definable properties, but this deemphasizes—if not wholly eliminates—the role of the listener. Far from a minor influence, the categorization processes involved in cognition appear to actually prioritize style even more than the piece itself, with regards to musical appreciation.³⁵¹

The use of machine learning could thus initially seem quite promising for the task at hand; namely, elucidating the meaning of Mozart’s music so that it can be “translated” into modern idioms. Latent patterns *within* the music could conceivably be used as abstract principles for just such a translation. But the issue with using machine learning to determine the essence of Mozart’s work is that machine learning is fundamentally comparative in nature. It handles new data according to what was previously learned through the training data, and the various patterns or similarities found *between* the two datasets. This approach would be appropriate if one were trying to find concrete similarities between works, but the present study is more analytical, instead attempting to evaluate the conceptual core of a work without reference to another.

Although the comparative nature of machine learning makes it unsuitable for this study, machine learning does contain an adjacent line of thinking—the listener-centric approach—which offers a point of departure for the present study into the fields of psychology and

³⁵⁰ McKay, 49.

³⁵¹ McKay, 54.

philosophy. Like a springboard into cognitive models and theories of listening, machine learning is a phantom presence which must be acknowledged, but if only indirectly in this research. jMIR conveniently contains many components which can be used independently of machine learning; one of which being jAudio, which was used here exclusively for the purposes of feature extraction. The ACE component of the jMIR software does present a potential avenue for future research, as it is a machine learning software designed to compare many different algorithms for myriad tasks like dimensionality reduction, pattern recognition, classification, and clustering.³⁵² By training these algorithms on the Mozart-Da Ponte operas, similarity comparisons could be made against Mozart's other operas, or even those of other composers. In addition, the workflow between the two would be streamlined, since the outputs of jAudio (that is, the extracted features) could be sent directly to ACE without alteration, due to the shared ACE-XML filetype.

Pre-Processing and Feature Extraction

jAudio is the feature extraction component of McKay's toolkit, jMIR. Pre-processing and digital signal processing are also conveniently handled by jAudio, which makes use of approaches specifically designed for music applications. This is notable because techniques designed for non-music audio are sometimes adapted for use within MIR, leading to inefficient and potentially questionable results.³⁵³ Once signals are pre-processed through operations such as normalization and windowing, they are ready for feature extraction.

Extracted features can be understood to exist at multiple levels connected by an iterative process: low-level features arise directly from computer processing of audio signals; various mid-level representations arise from subsequent derivations of these low-level features; and

³⁵² McKay, 27.

³⁵³ McKay, 113.

high-level features are the resultant, musically-meaningful attributes. But not all features require an iterative process to be understandable, as “certain low-level features can be useful even on their own”—especially by those users accustomed to working with audio signal processing.³⁵⁴ The degree of error, or noise, involved in feature extraction can be sharply mitigated by statistical operations, such as histograms, which jAudio intersperses automatically throughout the extraction process. When determining the salience of a particular feature for a given task, especially in the context of experimental studies, there is no established consensus for which features may prove most useful. And so, McKay observes that in this scenario, “it is clear that the acquisition of a large number of low-level features can be very useful, for the purposes of theoretical research.” The text by Lerch also promotes an investigation of the utility of various features; and accordingly, this study makes use of a broad selection of the 26 features available to jAudio, as an exploratory approach for determining significance.³⁵⁵

Figure 5.2. Settings used for feature extraction within jAudio:

❖ **Extracted Features**

- Spectral Centroid
- Spectral Roll-off Point
- Spectral Flux
- Compactness
- Spectral Variability
- Root Mean Square
- Fraction of Low Energy Windows
- Zero Crossings
- Strongest Beat
- Beat Sum
- Strength of Strongest Beat
- MFCC (13 coefficients)
- LPC (9 coefficients)
- Method of Moments (5 coefficients)

³⁵⁴ McKay, 115-116.

³⁵⁵ Lerch, 66; and McKay, 146.

Figure 5.2. (cont.)

❖ **Windowing**

- Window Size: 512 samples
- Window Overlap: 0

❖ **Audio Files**

- Uncompressed WAV files
- Stereo
- 44.1kHz sample rate
- 16-bit depth

- ❖ Each feature was measured every 512 samples through the course of each opera.
- ❖ Overall mean and standard deviation for each feature were then calculated per audio track.
- ❖ Standardization allowed feature means to be compared against one another through time.

The following table details each of the above features extracted for this study. Since jAudio was used for the feature extraction process, quotes by its author, Cory McKay, are included to clarify the particulars of each feature.³⁵⁶ This is especially important given that many variations of each feature exist across the literature. Lerch’s text was again used for background research, as it contains an exceptionally comprehensive discussion on features.³⁵⁷

Figure 5.3. Descriptions of each feature used within jAudio:

Spectral Centroid – A feature of timbre brightness. “The centre of mass of the power spectrum. Perceptually, this feature gives an indication of how “dark” or “bright” a sound is.”

Spectral Roll-off Point – A feature related to how much energy is in lower pitches. “The frequency below which some fraction, k (typically 0.85 or 0.95), of the cumulative spectral power resides. This provides a measure of the skewness of the power spectrum, and provides an indication of how much of the energy of the signal is in the lower frequencies.”

Compactness – A feature describing the magnitude spectrum. Based on the spectral smoothness algorithm, which “operates on a set of M spectral peaks, $T_i[m]$, found by some peak picking algorithm applied to the power spectrum corresponding to the analysis frame.” As opposed to the power spectrum, compactness is calculated based on the magnitude spectrum in general.

³⁵⁶ McKay, 133-138.

³⁵⁷ Lerch, 42-63.

Figure 5.3. (cont.)

Spectral Variability – A feature which segments the frequency spectrum into regions, and compares their relative powers. “The standard deviation of the bin values of the magnitude spectrum. Provides an indication of how flat the spectrum is and if some frequency regions are much more prominent than others”

Root Mean Square (RMS) – A general feature somewhat akin to loudness. “A measure of the average energy of a signal calculated over an analysis window”

Fraction of Low Energy Windows – A feature which indicates the amount of silence. “The fraction of analysis window within a set of consecutive windows that have an RMS below some threshold... This feature gives an indication of the proportion of silence or near silence in the portion of a signal under consideration.”

Zero Crossings – A feature related to noisiness. “The number of times that a signal passes the 0 midpoint of the signal range... This feature provides an indication of signal noisiness, as noisy signals with no DC component will have a tendency to cross the midpoint often.”

Mel-Frequency Cepstral Coefficients (MFCC) (13 coefficients) – A feature vector which describes the shape of the frequency spectrum at an instant. “This feature vector is calculated by taking the log-amplitude of the magnitude spectrum and then grouping and smoothing the bins based on the perceptually motivated Mel-frequency scale. A discrete cosine transformation is applied. Traditionally, 13 coefficients have been used in much speech-oriented research”

Linear Predictive Coding (LPC) (9 coefficients) – A feature vector related to formants and identifying the original musical source (voice, instrument etc.). “LPC can be used to analyze a speech signal by estimating *formants* (spectral bands corresponding to resonant frequencies in the vocal tract), filtering them out, and estimating the intensity and frequency of the residual “buzz” that is assumed to be the original excitation signal. The result is a vector of values that can be used to estimate the formants and the residue... With respect to music, LPC can be useful in that the relationships between the formants and the nature of the residue can be helpful in identifying instrument types, for example.”

Method of Moments (5 coefficients) – A feature vector describing the magnitude spectrum. “A feature vector consisting of the first five statistical moments of the magnitude spectrum. These consist of the area (0th order), mean (1st order), spectral density (2nd order), skew (3rd order), and kurtosis or “peakedness” (4th order)... As a unified feature vector the method of moments can provide a compact statistical representation of the magnitude spectrum.”

It should be noted that the above features are primarily pitch- and magnitude-related, but more temporally-related features can be found through utilizing a Beat Histogram. With tempo on the x-axis and Beat Strength on the y-axis, the beat spectrum visualizes the rhythmic organization of audio. For most conventional music with a rhythmic meter, “peaks in the histogram should therefore correspond to the main tactus and its integer multipliers and divisors.”³⁵⁸

³⁵⁸ Lerch, 133-134.

Figure 5.3. (cont.)

Strongest Beat – A feature related to the most prominent pulse; it is the BPM of the highest peak within the spectrum.

Beat Sum – A feature which indicates rhythmic clarity; it is found by taking the overall sum of the beat histogram.

Strength of Strongest Beat – A feature describing the degree of primacy which the most prominent pulse exhibits when compared to all other pulses present. It is the relative amplitude of the highest peak.

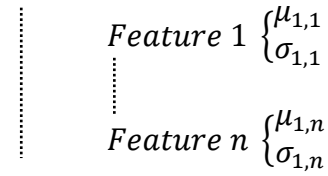
Aside from the precedent set by Eerola, the decision to use low-level features which are directly calculated from the audio signal—as opposed to high-level features such as exact pitches, chords, and rhythms—is due to the fact that precise and reliable derivations of high-level features have not yet been discovered. McKay admits that “it is not currently known how to reliably automatically extract such high-level information from general signals.”³⁵⁹ The use of low-level features thus has the distinct advantage of being less theoretical or uncertain; and though these features do not necessarily align with conventional musical terms, this may also be their greatest strength. In short, low-level features may offer novel perspectives and attributes not otherwise found when considering conventional terms alone.

Each Feature (n) was evaluated for every 512 samples with no window overlap for the entire duration of each opera. These windowing settings are the defaults for jAudio, and since this is not a machine learning application where optimization is necessary, there was no pressing need to alter conventional parameters. The feature extraction generated a series of values which was then dimensionally reduced and segmented by taking an overall mean (μ) and standard deviation (σ) for each Track (m).

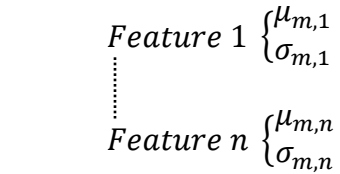
³⁵⁹ McKay, 138.

Figure 5.4. Feature extraction schematic through the course of an opera:

Track 1:

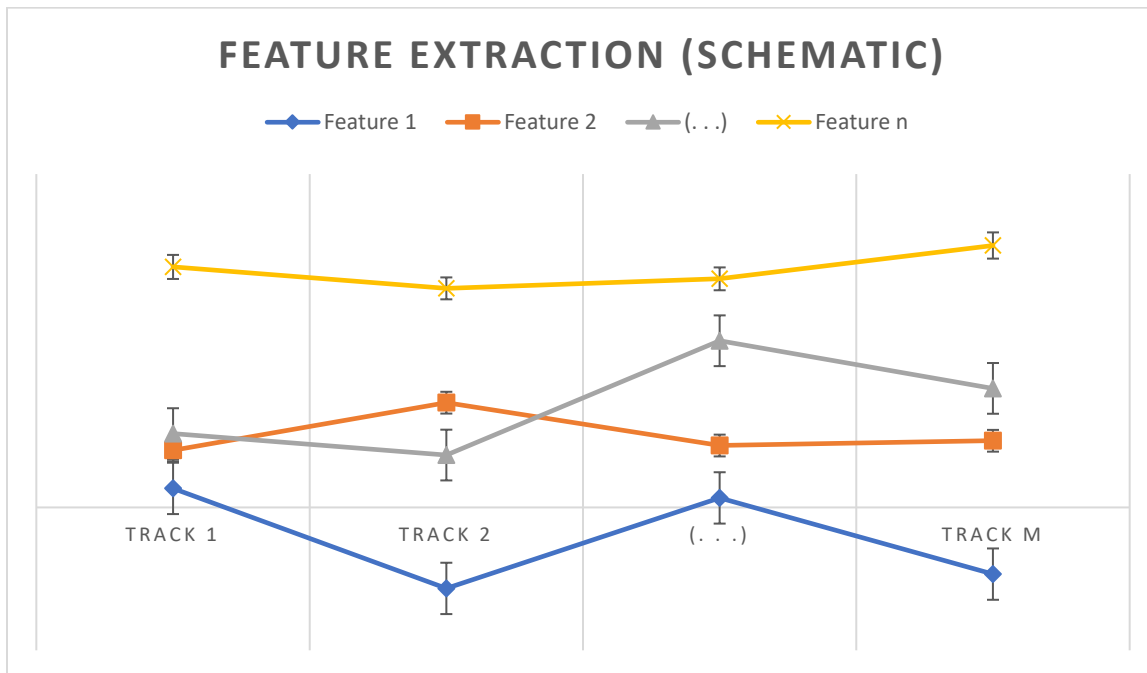


Track m:



By plotting the mean of each feature as it changes from track to track, and assigning the corresponding standard deviation to +/- bars; a chart for each opera can easily be created as shown below.

Figure 5.5. The results of plotting Figure 5.4:



Post-Processing

Figure 5.5 places all features in the same coordinate plane, but to accurately compare features against one another, *data scaling* must first be employed, since many features exhibit significantly disparate ranges across a variety of units. That is, the means of various features cannot be directly compared until scaling is applied. While data scaling is most often associated with pre-processing (that is, prior to feature extraction), it can also be used during post-processing, so that features can be compared.³⁶⁰ A common method for achieving this is called Z-score normalization, or simply *standardization* for short. The result of this calculation is that all features have an average of zero, and that they vary by units of standard deviation.

Normalization is another common method for scaling, but it is susceptible to outliers in a dataset, and does not take standard deviation into account. Making use of the standard deviation values automatically calculated by jAudio, while also reducing the impact of outliers, gives standardization an advantage for data scaling in this study.

Z-score standardization, general equation:

$$z = \frac{x - \mu}{\sigma}$$

Where z is the new, or scaled, value of x , which takes the mean (μ) and standard deviation (σ) of x into account. Within the context of Figure 5.4, a more detailed rendering of the standardization equation would be as follows:

³⁶⁰ Lerch, 63-64.

$$z_{m,n} = \frac{\mu_{m,n} - \bar{\mu}_n}{\bar{\sigma}_n}$$

Where $z_{m,n}$ is the scaled value of $\mu_{m,n}$ which is itself the overall average of Feature n within the timeframe of Track m . Note also that while $\mu_{m,n}$ represents an extracted feature of a single track, the means of μ and σ are taken for each particular feature over the course of the whole opera (Tracks 1 to m) as arithmetic means in the following manner:

$$\bar{\mu}_n = \frac{\mu_{1,n} + \mu_{2,n} + \dots + \mu_{m,n}}{m}$$

$$\bar{\sigma}_n = \frac{\sigma_{1,n} + \sigma_{2,n} + \dots + \sigma_{m,n}}{m}$$

The distribution of a dataset is an important factor in data scaling, as many methods either assume or impose specific distributions. Standardization, for instance, assumes a Gaussian distribution, while *normalization* has the distinct advantage of neither requiring nor creating a specific distribution. The issue of distribution is somewhat unclear in the realm of audio content analysis since statistical tests for Gaussianity fail for the “large numbers of observations” which are common to the field.³⁶¹ This study’s use of 512-sample windows, for example, yields over 300,000 instances per feature, per opera. Lerch also admits that for practical applications it is usually sufficient to have only roughly approximated distributions with a skewness which does not exceed two. As the current study is exploratory in nature, and less concerned with external absolutes than with internal comparisons, a skewness of less than, or equal, to two is deemed appropriate. Each feature for each opera was subsequently calculated for skewness, and all

³⁶¹ Lerch, 65-66.

scores were found to conform to the benchmark—lending credence to the use of Z-score standardization in this study.

With standardization implemented as described above, all features can appropriately be placed in the same coordinate plane—varying through time—with a separate coordinate plane for each individual opera. But what has not been addressed, is the question of why this particular representation is the most desirable for the study, when any number of other options can be conceived. Furthermore, the preceding processes of segmentation and dimensional reduction (according to audio track bounds) reduces features from being essentially real-time in nature, to describing single tracks. The answers to these questions, in a very general sense, are: (1) that this study is concerned with the analysis of *specific* musical materials, not with the discovery of *general* principles (at least for the purposes of computation); and (2) that the immensely macro perspective of this study renders many features, which are useful on smaller scales, largely incoherent and useless when zoomed out sufficiently. Considerations of data scaling and timescale will be discussed below.

* * *

Data scaling allows features to both be compared against each other and considered as a whole, but this is not strictly necessary, since features can also be correlated individually to the music itself (waveform or notated score). The result of the latter method is appropriate for many machine learning applications which require general principles (e.g., music exhibiting high feature x and low feature y can be placed into the same playlist z). But as this study specifically analyzes the Mozart-Da Ponte operas alone, and also seeks to quantify the relevance of various features to this task, it is necessary to evaluate features on the same vertical scale.

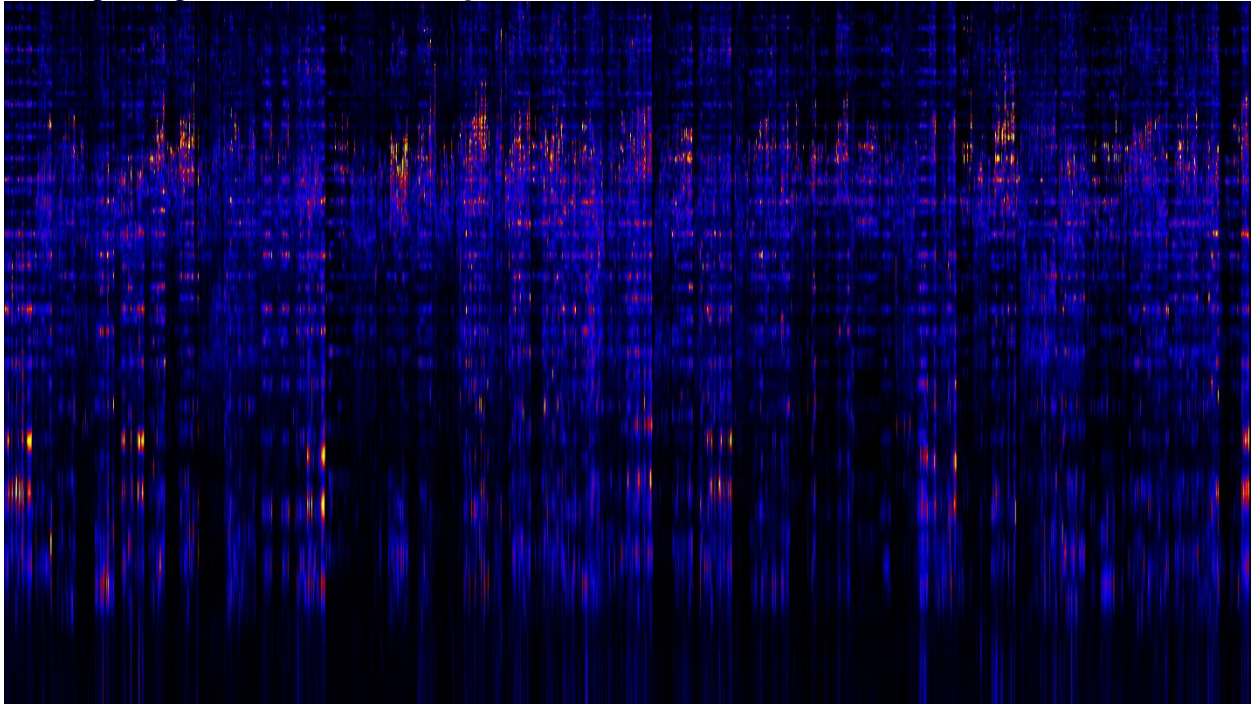
In the horizontal direction, the large duration of this study presents a serious challenge in a field which conventionally uses much smaller excerpts of works. This is because at the local level, finer details become discernible, and features can be observed as they change in time with the music. But at the macro level, these details are insignificant, and any correlation between extracted and musical features becomes difficult. In short, there is little sense of long-term change or progression in signals which appear roughly as static noise. Understanding how an opera changes on a structural level thus requires segmentation and dimensional reduction to summarize larger groups of data, in order for trends to emerge.

Although it is easy to imagine placing a graph of each feature alongside the score itself, forgoing data scaling entirely, and attempting to find correlations between the score and features—as Eerola’s study briefly entertains—the result, for even a piece as short as *Erlkönig*, is that segmentation and reduction must be employed to make sense of the data.³⁶² Note that Eerola does not need to implement data scaling since the goal is to correlate feature values with participant scores, thus extracting general principles. But without segmentation and reduction, features appear to be static noise or rough sinusoids completely unaffected by musical material, and utterly lacking in utility for the music analyst. Segmentation and dimensional reduction therefore allow for some semblance of change to be discerned when analyzing a graph of an entire musical piece, while data scaling allows different features to be compared. Figures 5.6 (a.—d.) are included below to illustrate how traditionally useful measures (here, the spectrogram) have limited value on the macro scale.

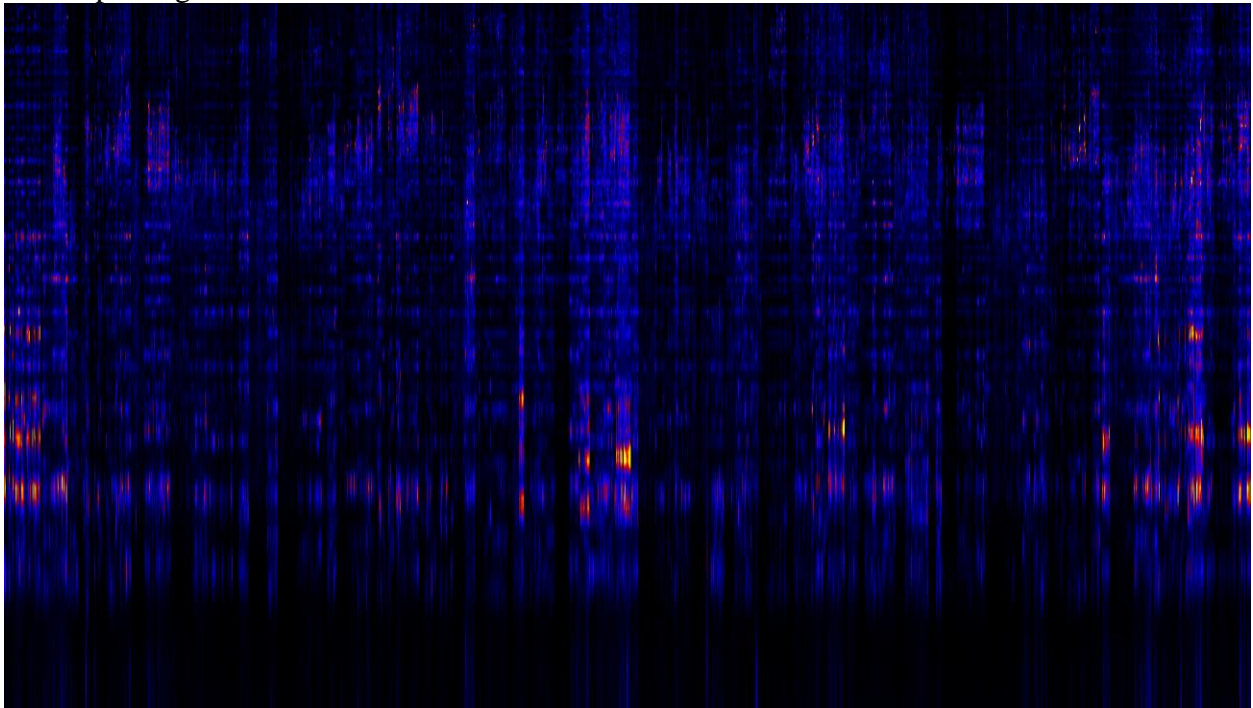
³⁶² Eerola, 218.

Figure 5.6(a.—d.). Spectrograms of *Figaro*, *Don*, and *Così* (all adjusted to melodic range)

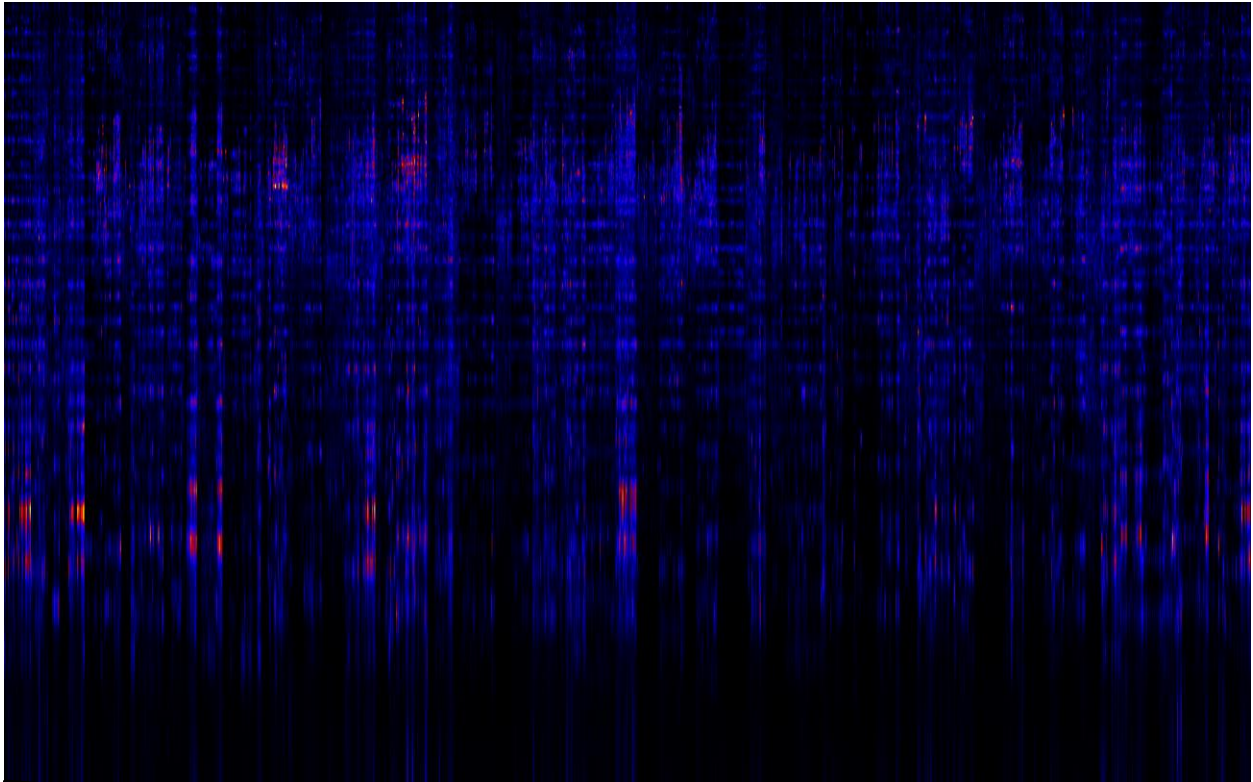
5.6a. Spectrogram of *Le nozze di Figaro*



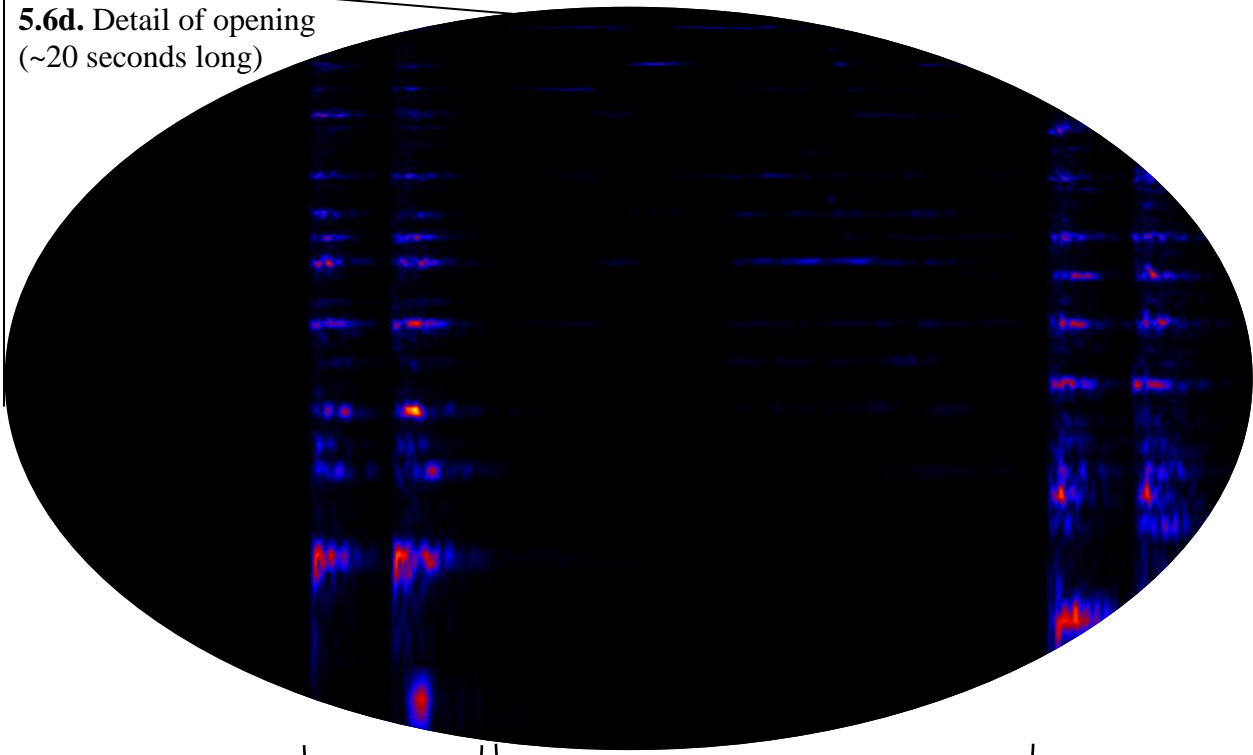
5.6b. Spectrogram of *Don Giovanni*



5.6c. Spectrogram of *Così fan tutte*



5.6d. Detail of opening
(~20 seconds long)



Full Orchestra Woodwinds

As can be seen in the first three figures, (5.6a. through c.) there is very little to differentiate each opera, and almost no sense of how they change over time. Some semblance of a sectional structure is exhibited though, with more vivid groups of bars often juxtaposed with softer, less spectrally full sections. In the final figure, (5.6d.) which is a detail of the opening of *Così*, there is a much more direct correspondence to the score itself. The initial tutti chords are followed by a soft, legato line in the woodwinds, whereupon the tutti chords return again to repeat the process. Only at the detailed scale can this musical dialog clearly be seen, with the first and second groups of tutti chords brightly framing the faint woodwind line in the center.

With regard to the preceding discussion, it is clear that this study requires an efficient method of testing various data visualizations. Sonic Visualiser is an open-source software application “for analysis, visualisation, and annotation of music audio files” designed by the Centre for Digital Music, Queen Mary University of London.³⁶³ Similarly to jMIR, Sonic Visualiser is intended for use in musicology and music theory research, and specifically designed with non-computer science users in mind. The software proved to be capable of handling the entire duration of all three operas simultaneously, while also overlaying various visualizations of the audio. In particular, Sonic Visualiser was used to display the audio waveform, to calculate the “Merged Key Strength” plot, to annotate the graphs with formal divisions (each act and number), and to superimpose all these visualizations accurately.

Sonic Visualiser is capable of displaying a huge variety of audio characteristics, and for this study, the software served as an experimental workbench which allowed characteristics to be quickly tested and compared. This proved to be extremely useful, given that the macro-level

³⁶³ Chris Cannam, Christian Landone, and Mark Sandler, “Sonic Visualiser: An Open Source Application for Viewing, Analysing, and Annotating Music Audio Files,” in *Proceedings of the 18th ACM International Conference on Multimedia*, 1467-1468, New York: Association for Computing Machinery, 2010: 1.

perspective (necessarily adopted when comparing three operas in their entirety) led to serious complications. In particular, tonality emerged as a powerful descriptor at the macro level, exhibiting clearly discernible contours amenable to analysis. Interestingly, just as jMIR's machine learning components offered a springboard into adjacent fields (the psychological and philosophical aspects of this research), so too did Sonic Visualiser—but here, into the music theory of tonal planning.

The advantage of considering key, especially within an era of functional tonality, is that key is naturally a macro attribute describing the aggregate pitch material likely present. On a yet higher level, the intentional ordering or symbolic use of key is referred to as “tonal planning”—a topic discussed at length in Section X. Presently though, the dual methodologies used by this study with regards to tonality (computational key detection and manual score analysis) will be examined.

Sonic Visualiser's included plugin “Key Detector” was used to output a plot of merged key strength, which is—more specifically—the “correlation of the chroma vector with stored key profiles for each key, with major and minor alternatives merged.”³⁶⁴ In other words, it tracks (through time) the clarity/intensity of the key exhibited by the audio, and arranges the results vertically in terms of accidentals, or key signature, as follows: with C major/A minor at the center of the y-axis (0 accidentals); F# major/D# minor at the top (+6 accidentals); and D♭ major/B♭ minor at the bottom (-5 accidentals).

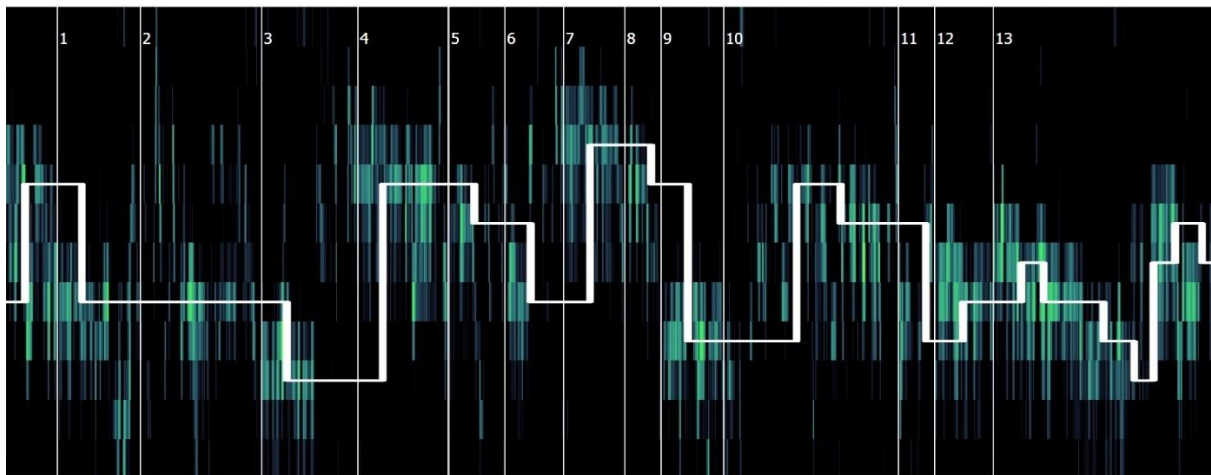
The use of two methods for key detection may initially seem redundant, but while Sonic Visualiser provides quasi-continuous, moment-to-moment details, score analysis provides overarching, notated signatures. It is important to note that this by-hand analysis does not reflect

³⁶⁴ Description as given within the software itself.

internal modulations which do not receive a notated key change. In other words, the manual score analysis of key only shows notated and relative key changes. Its purpose is to provide a general structure while also corroborating the merged key strength plot, which in turn provides a finer level of detail than would be practical manually. Superimposing the results of the two methods (computed and manual) thus allows for both local and macro level evaluations of key to be shown simultaneously. Though discussed at length in the Results section, Figure 5.7 is included here to better illustrate the relationship of these two methods, which are overlaid and presented together.

Figure 5.7. *Don Giovanni*, Act 1, Key Analysis:

- ❖ Numbered lines = opera numbers
- ❖ White line = notated key signature (manual)
- ❖ Green bars = merged key strength plot (computational)



Justification for the Choice of the Mozart-Da Ponte Operas

Research in music theory and musicology frequently focuses on specific musical examples, while cognitive and computational studies tend to favor larger sample sizes.³⁶⁵ The choice of musical materials is thus generally in accordance with the amount of abstraction sought by the particular study. For example, computer and cognitive models which aim to be broadly replicable require larger samples in order to extrapolate general principles. But music theory and musicology studies which analyze specific topics require a narrower focus, partly due to the limitations of conventional, by-hand analysis. As the current study sits at the intersection of the aforementioned fields, it is necessary to provide a justification for the choice of specific—as opposed to broad—musical materials, as well as for the use of the Mozart-Da Ponte operas in particular.

The dilemma, as presented above, seems to be one of focus (broad/narrow, macro/micro etc.), but this is somewhat of an oversimplification, as the choice also alters which variables are present. For instance, broad samples are double-edged, in that they deemphasize variables related to specific instances while also introducing variables between them. The cognitive and computational aspects of this study could conceivably be approached in such a broad manner, attempting to investigate how music, in general, creates meaning. But this would render culture- and era-specific characteristics as abstract variables—more of a theoretical exercise than a specific application. The ability to use concrete examples, besides being convenient, keeps interdisciplinary studies such as this one connected, like a common thread running through the various fields. So, while some ramifications of the current research may concern musical meaning in general, they will only be arrived at through the focused study of Mozart specifically.

³⁶⁵ Eerola, 214.

Mozart is arguably the most well-known and extensively studied composer across various fields, which increases the likelihood of overlap with regards to source material. Especially for areas outside of music, such as psychology or computer science, selection of musical examples in studies is (understandably) either very mainstream or limited. So, to have any serious chance of finding sources from each field (psychology, philosophy, computer science etc.) which would all cover the same composer, only the most conventional options could be considered. The main advantage which Mozart presents lies primarily in his large body of operatic work. Within the context of this study, opera offers numerous benefits: additional layers of meaning through verbal language (plot, libretto etc.); substantial duration of single works; and a diverse timbre covering the entire pitch spectrum. These factors will be discussed below.

In terms of text, Eerola points out that it “partly (if not wholly) validates the emotional interpretation of the musical material; making allowance for irony and nuance, it is a fair bet that the words...identify the affect of the music.”³⁶⁶ While the relationship between text, music, and meaning is hardly straightforward, there is at least additional information available to the researcher. Similarly, works of great length which are conceptually unified as a single object provide the computer with a vast quantity of cohesive data. When considering the previous resolution to use specific musical examples, the need for those few selections to provide sufficient data becomes apparent. Lastly, the aptitude for spectral features which computers naturally exhibit can best be utilized by ensembles capable of timbral variety.³⁶⁷ German Lieder and song cycles, for instance, contain text and unifying concepts, but lack timbral diversity due to the limited instrumentation of voice and piano. Taking this array of factors into account, there are two favorable candidates which emerge: the oratorios of Bach and the operas of Mozart.

³⁶⁶ Eerola, 221.

³⁶⁷ Eerola, 215.

The Bach oratorios could in fact present an avenue for future research, but they were rejected in the current study due to the relative lack of scholarship available when compared against the Mozart operas. Mozart is so ubiquitous as to be difficult to avoid in the literature, and there is a great deal of social commentary within the operas as well. Additionally, Mozart collaborated with the librettist Lorenzo Da Ponte on three separate occasions—producing *The Marriage of Figaro* (1786), *Don Giovanni* (1787), and *Così fan tutte* (1790).³⁶⁸ Using this trio removes the variable of librettist while also lending the study extra consistency across roughly nine hours of music.

To the knowledge of the author, there is no prior study which focuses solely on the Da Ponte operas in a comprehensive and comparative manner. Though innumerable studies cover the works of Mozart, the lack of direct comparison between these three operas is striking, and so the present study seeks to both address a gap in existing scholarship and to offer novel approaches for music analysis. Specifically, the use of computer-based feature extraction allows for the macro analysis of the three operas in their entirety—works whose considerable duration would normally be a hindrance—as well as presenting a new perspective on the works’ meaning. In this regard, the study offers but one “reading” among an infinite array of approaches to musical meaning.

* * *

Due to the use of feature extraction in this research, the choice of audio recordings becomes one of nontrivial consequence. And though there are, of course, a tremendous number of recordings to choose from when considering Mozart’s operas—the particular requirements of feature extraction can be used to significantly narrow the field. In particular, consistency of

³⁶⁸ Hunter, 1.

timbre emerges as a factor of primary importance; meaning ensemble, venue, recording equipment, audio engineering, and so forth should ideally be identical across all three recordings. Sound quality should not only be consistent across the operas, but of the utmost quality available, so that the computational analysis is less affected by noise or digital artifacts. Furthermore, a consistency of *vision* across the operas—where all recordings are part of the same project with a unified intent—removes many variables by manner of a coherent artistic interpretation. Factors which would normally be of great import, like critical reception and degree of influence, are somewhat downgraded in favor of the above considerations, which may be summarized as those which strictly affect the *consistency of sound*.

While widely-respected recordings conducted by Georg Solti, Riccardo Muti, and especially Nikolaus Harnoncourt were entertained, they were all eventually rejected on the grounds of sound consistency and/or quality. Dated recordings, live performances with audience noise, changes of venue, and so on, led to many recordings being rejected for this study. Particularly with performances separated by many years, significant changes in personnel becomes likely—both with regard to recording engineers and musical performers. In fact, only one candidate emerged which satisfied the above demands: the recent Da Ponte Cycle recording project produced by Sony Classical in partnership with conductor Teodor Currentzis and his period-instrument ensemble, MusicAeterna.³⁶⁹

Recorded in-studio with close microphones and period instruments, the level of detail and sound quality in the Currentzis recordings is unparalleled. Across a span of about three years, the

³⁶⁹ MusicAeterna, *Mozart: Così fan tutte*, conducted by Teodor Currentzis, with the Orchestra and Chorus of the Perm Opera and Ballet Theatre, recorded January 9 – 19, 2013, Sony Classical 88843095832, 2014, 3 CDs; MusicAeterna, *Mozart: Don Giovanni*, conducted by Teodor Currentzis, with the Orchestra and Chorus of the Perm Opera and Ballet Theatre, recorded November 23 – December 7, 2015, Sony Classical 88985316042, 2016, 3 CDs; MusicAeterna, *Mozart: Le nozze di Figaro*, conducted by Teodor Currentzis, with the Orchestra and Chorus of the Perm Opera and Ballet Theatre, recorded September 24 – October 4, 2012, Sony Classical 88843014162, 2014, 3 CDs.

operas were recorded and released as part of the same recording project, leading to very minimal personnel changes—mostly seen in just the vocal soloists. Furthermore, the physical isolation of the ensemble (then located in Perm, in a remote region of the Urals), the unheard-of amount of time afforded to solely focusing on the recording project (there are references to all-night recording sessions in the liner notes), paired also with the exacting and comprehensive vision of Currentzis, makes these three recordings unusually unique and cohesive.³⁷⁰ Though perhaps not as critically respected or influential as the aforementioned recordings, the Da Ponte cycle recordings by MusicAeterna and Currentzis are completely unmatched in terms of consistency of sound, quality of recording, and unity of artistic vision; making them the ideal choice for this study.

While the preceding consideration of sound recordings merited a lengthier discussion, the choice of score edition is not nearly so contested. The second complete works critical edition, *Neue Mozart-Ausgabe* (or, the New Mozart Edition), which is often referred to simply as NMA, easily provides the most authoritative edition available for scholarly use. As the complete works of Mozart are exceptionally large, the NMA is organized into three tiers: first by Series, which organizes works according to type; second by Work Group which organizes works into subtypes; and third by Volume, where individual works are filed. For example, all three of the operas for this research can be found under the same Series (II: Theatrical Works) and Work Group (5: Operas and Singspiels) but are found in separate Volumes (*Figaro*, vol. 16; *Don*, vol. 17; and

³⁷⁰ Marc de Mauny, “A Musical Commune,” in liner notes for *Mozart: Le nozze di Figaro*, MusicAeterna, cond. Teodor Currentzis, recorded September 24 – October 4, 2012, Sony Classical 88843014162, 2014, CD, 27-28.

Così, vol. 18).³⁷¹ The NMA understandably adopts a shorthand for this system, which will also be used here, such that the three scores can be referred to as NMA II/5/16, II/5/17, and II/5/18.

While all three Italian libretti were written by Lorenzo Da Ponte, there are many versions which exist today due to differences in performance practice. Optional or alternative sections are often added, substituted, or omitted, and many competing translations are available. Stemming from the fact that “Mozart himself altered his operas either in the process of production or for subsequent productions,” Hunter contends that “there is no single inarguably perfect text for most of these works.”³⁷² Libretto translations for this study were thus selected according to those used by the MusicAeterna productions.³⁷³ Using the same translations as the recordings ensures consistency, and also eliminates potential differences in structure and order. A more comprehensive discussion on performance practice with regards to these extant versions could easily necessitate its own study; and so, the basic understanding that the libretto translation and recording are matched must be taken as sufficient.

³⁷¹ W.A. Mozart, *Le nozze di Figaro*, NMA II/5/16, ed. Ludwig Finscher (New York: Bärenreiter, 1973); W.A. Mozart, *Don Giovanni*, NMA II/5/17, ed. Wolfgang Plath and Wolfgang Rehm (New York: Bärenreiter, 1968); W.A. Mozart, *Così fan tutte*, NMA II/5/18, ed. Faye Ferguson and Wolfgang Rehm (New York: Bärenreiter, 1991).

³⁷² Hunter, 3.

³⁷³ Lorenzo Da Ponte, *Le nozze di Figaro*, trans. [Anonymous], in liner notes for *Mozart: Le nozze di Figaro*, MusicAeterna, cond. Teodor Currentzis, recorded September 24 – October 4, 2012, Sony Classical 88843014162, 2014, CD, 72-339; Lorenzo Da Ponte, *Don Giovanni*, trans. Avril Bardoni, in liner notes for *Mozart: Don Giovanni*, MusicAeterna, cond. Teodor Currentzis, recorded November 23 – December 7, 2015, Sony Classical 88985316042, 2016, CD, 62-273; Lorenzo Da Ponte, *Così fan tutte*, trans. Albert Windolph, in liner notes for *Mozart: Così fan tutte*, MusicAeterna, cond. Teodor Currentzis, recorded January 9 – 19, 2013, Sony Classical 88843095832, 2014, CD, 66-279.

Results and Discussion

Given the emphasis which the current study has granted to extramusical considerations, it seems fitting to begin this section with an account of each opera's plot. The results of the score analysis and feature extraction will be presented afterward, given that their various tables and graphs can tend to appear self-sufficient, or as a contiguous whole when observed alone. By situating the intramusical results within the momentary unfurling of plot, a clearer understanding of their exchange may be found. This approach is broadly analogous with Agawu's semiosis in that intramusical and extramusical meaning are accounted for holistically.³⁷⁴

Le nozze di Figaro Synopsis

Figaro and Susanna are set to be married, but the unfaithful Count intervenes due to his feelings for Susanna. What follows is a series of schemes and deceptions, where Figaro and Susanna (with the assistance of the scorned Countess) aim to expose the Count and restore their wedding, while the Count aims to derail the wedding and rendezvous with Susanna. The Count nearly succeeds in marrying Figaro off to another woman (Marcellina), but Figaro's noble birth is discovered, and Marcellina is revealed to be his mother. Through further disguises and mistaken identities, Figaro and Susanna are reunited, the Count sees the err of his ways, and the love between the Count and Countess is rekindled.

ACT 1 – *Figaro and Susanna's chambers*

❖ Scene 1

- On their wedding day, Figaro and Susanna, servants of Count Almaviva and Countess Rosina Almaviva (respectively), are inspecting their new room when

³⁷⁴ V. Kofi Agawu, *Playing with Signs: A Semiotic Interpretation of Classic Music*.

Susanna reveals she is suspicious of the Count. The count intends to bed her on her wedding night, according to a previously abolished custom. Figaro vows to thwart the Count's plans.

❖ Scene 2

- Doctor Bartolo and his housekeeper, Marcellina plot to stop the wedding as well. Marcellina has feelings for Figaro, and is in possession of a contract previously signed by Figaro. The contract states that Figaro will marry Marcellina if he is not able to repay the money which he loaned from her. As for the doctor, he dislikes how Figaro has treated him in the past, and plans to use this opportunity to humiliate Figaro. Susanna and Marcellina exchange passive-aggressive pleasantries until Marcellina and Bartolo leave.

❖ Scene 3

- Cherubino, a young page, is to be sent away after being discovered with the gardener's daughter, Barbarina. Cherubino is deeply infatuated with all women, and cannot bring himself to ask the Countess to intercede on his behalf—a task he sets before Susanna. Before she can respond, they are interrupted by the arrival of the Count, and Cherubino is forced to hide behind a chair. As the Count is attempting to set up a tryst with Susanna, he is also sent hiding upon the arrival of Basilio, the music teacher. When Basilio begins gossiping to Susanna about Cherubino's crush on the Countess, the Count emerges from his hiding spot enraged. He soon discovers Cherubino hiding in the room, and—realizing that the page has overheard his advances on Susanna—decides to send Cherubino away to a military post. Figaro arrives with a chorus of peasants intent on witnessing the

wedding (a pure, unsullied one) immediately, but the Count stalls this by promising a lavish feast to come. Figaro outwardly teases Cherubino about his new posting, but secretly tells him to meet later.

ACT 2 – *Countess Rosina's chambers*

❖ Scene 1

- The Countess mourns the infidelity of her husband and decides to assist Figaro and Susanna in their plans to thwart her husband: Through a false letter delivered by Basilio, the Count will be alerted to a lover his wife has taken, and Cherubino will be sent in disguise as Susanna to rendezvous with the Count. They hope to distract the Count from stalling their wedding, while also exposing his intentions.

❖ Scene 2

- Figaro leaves to fetch Cherubino, who bemoans his situation while Rosina and Susanna dress him as a woman. While Susanna is away fetching another ribbon, the Count arrives in response to the letter, and Cherubino hides in a locked inner room.

❖ Scene 3

- The Count angrily questions the Countess and becomes suspicious of the locked inner room, eventually deciding to leave with the Countess and return with a crowbar. Susanna and Cherubino take this opportunity to switch places, with Cherubino exiting via an open window.

❖ Scene 4

- Upon the Count and Countess' return, Rosina confesses their plans for fear of Cherubino's safety, but is shocked to see Susanna emerge from the locked room.

The two women then attempt to evade the Count's questions, while Figaro's arrival prompts further questioning.

❖ Scene 5

- Antonio, the gardener, arrives and reports that Cherubino jumped from the window and dropped his military contract in the process; and furthermore, that it is missing the Count's royal seal. As Figaro and the women attempt to discredit Antonio and claim that the jumper was Figaro himself, they are interrupted by the arrival of Bartolo, Marcellina, and Basilio. The newcomers reveal Figaro's failure to honor their contract, and the Count happily agrees to postpone the wedding and investigate the matter.

ACT 3 – *The Count's hall*

❖ Scene 1

- As the Count ponders his situation, Susanna arrives—at the urging of the Countess—and agrees to rendezvous with the Count later that night in the garden. As she is leaving, the Count overhears Susanna assuring Figaro that his financial woes will soon be over, and the Count resolves to take vengeance for the apparent deception.

❖ Scene 2

- In the ensuing hearing, Figaro reveals a birthmark which identifies him as the long-lost illegitimate son of Bartolo and Marcellina, stolen away at birth. Figaro is of noble birth. Susanna enters, mistakenly believing the scene of joyful reconciliation to be Figaro's renouncement of her. After Figaro's explanation is corroborated, Susanna is overjoyed while Bartolo and Marcellina are moved to

declare that they will marry—the couples then celebrate their upcoming double wedding together.

❖ Scene 3

- The Countess bemoans her loss of happiness, but Susanna agrees to help her expose the Count: Susanna will give a letter to the Count, pretending to reconfirm their tryst in the gardens, but Susanna and the Countess will swap disguises. Meanwhile, Antonio informs the Count that Cherubino did not go to his military post as ordered. They discover that Barbarina has disguised Cherubino as a girl amongst a chorus of peasants, but before the Count can act on his rage, Barbarina requests to marry Cherubino. The Count reluctantly agrees, as he promised Barbarina a favor when previously attempting to seduce her. The double wedding finally occurs, and in the celebrations, Susanna successfully slips the letter to the Count, unbeknownst to Figaro.

ACT 4 – *The gardens at night*

❖ Scene 1

- Figaro discovers Barbarina crying over a lost pin which she was to deliver to Susanna for the Count. Figaro, assuming the pin is a sign of Susanna's infidelity, flies into a rage and discusses his plans for revenge with Marcellina, Bartolo, and Basilio.

❖ Scene 2

- Susanna and the Countess arrive, causing Figaro to hide. As Marcellina has already informed Susanna of Figaro's plans, Susanna sings a love song aloud, knowing Figaro will mistakenly believe it is for the Count.

❖ Scene 3

- The Countess, fully disguised as Susanna, plants herself as bait in the gardens but attracts the attention of Cherubino instead. The Count arrives, scares off the young page, and begins seducing “Susanna” in earnest. Meanwhile, Figaro becomes privy to the disguises and decides to play along, declaring his love for the “Countess” (Susanna) who quickly drops her role in anger. The couple have a chance to explain their situations, and once reconciled, determine to finish the matter together.

❖ Scene 4

- “Susanna” has slipped away from the Count, and as he is searching for her, he walks in on Figaro and the “Countess” in the gardens. Completely enraged, the Count calls out, drawing the attention of all. The disguised Countess steps forward and reveals her true identity for all to see, and the Count is publicly shamed. He asks her to pardon him, which she accepts, and the two are reconciled. All return to the celebrations contented.

Don Giovanni Synopsis

The philandering nobleman, Don Giovanni leaves a wake of bitter lovers and rivals in his wake. After killing Il Commendatore in one such duel, Giovanni and his servant, Leporello engage in a series of schemes and disguises designed to elude their pursuers and seduce the newly-married Zerlina. Ultimately, the entourage seeking justice is placated when the ghost of Il Commendatore intervenes, dragging Don Giovanni to hell after he refuses to repent.

ACT 1

- ❖ Scene 1 – *The garden of the Commendatore*
 - Don Giovanni attempts to seduce/rape Donna Anna, who is engaged to Don Ottavio. In retaliation, Donna Anna's father, Il Commendatore (Don Pedro) challenges Don Giovanni to a duel, and is fatally wounded. Don Giovanni and his servant, Leporello make an escape while Ottavio and Anna vow revenge.
- ❖ Scene 2 – *A public square near Giovanni's castle*
 - Don Giovanni is recognized by a bitter former lover, Donna Elvira. Leporello attempts to placate her as Giovanni slips away again.
- ❖ Scene 3 – *The open country*
 - Giovanni and Leporello happen upon a country wedding for the peasants Zerlina and Masetto. Giovanni tries to seduce the bride, prompting Elvira to intervene on Zerlina's behalf and Leporello to distract Masetto from his anger. Ottavio and Anna recognize Giovanni, who has invited the wedding party to his castle.
- ❖ Scene 4 – *A garden outside Giovanni's castle*
 - An argument concerning fidelity between Masetto and Zerlina is interrupted by another attempt by Giovanni to seduce Zerlina. Spying upon them, Masetto thwarts Giovanni, who quickly denies his ill intentions. Meanwhile, Ottavio, Anna, and Elvira gain entrance to the party through disguises.
- ❖ Scene 5 – *Don Giovanni's ballroom*
 - While Leporello distracts Masetto, Giovanni attempts to assault Zerlina, who screams and gains the attention of the guests. Don Giovanni attempts to frame

Leporello, but all see through his lie and stand against him, whereupon the Don makes yet another escape.

ACT 2

❖ Scene 1 – *Outside Donna Elvira's house*

- Giovanni and Leporello trade disguises to separate Elvira from her maid, so that the disguised Don can seduce the maid while Leporello leads Elvira away. Giovanni is interrupted by Masetto and his friends, but as he is disguised as Leporello, manages to disperse the group, disarm Masetto, and beat him up.

❖ Scene 2 – *A dark courtyard*

- Leporello (still disguised as Giovanni) and Elvira are joined by Ottavio, Anna, Masetto, and Zerlina, whose combined anger forces Leporello to reveal his true identity and escape. Elvira still holds onto hope for Giovanni while Ottavio finds a greater resolve for revenge.

❖ Scene 3 – *A graveyard with a statue of the Commendatore*

- Don Giovanni and Leporello are reunited in a graveyard, whereupon a statue of the Commendatore interrupts their fighting and declares that Giovanni's laughter will not last past the coming dawn. Giovanni is unperturbed and forces Leporello to invite the statue to dinner, and the invitation is accepted.

❖ Scene 4 – *Donna Anna's room*

- Ottavio pressures Anna into marrying him, but she refuses his hand until her father's murder is avenged.

❖ Scene 5 – *Don Giovanni's chambers*

- At the great feast, Elvira begs Giovanni to change his ways, but he refuses her.

The statue of the Commendatore arrives to dinner and offers Giovanni a final chance for repentance, to which he refuses as well. Don Giovanni is condemned at last, as a chorus of demons drag him down to hell. Ottavio and Anna will marry after Anna's year of mourning ceases, Elvira will withdraw from society for the remainder of her years, Masetto and Zerlina will return home, and Leporello will search for a better master.

Così fan tutte Synopsis

Officers Ferrando and Guglielmo are engaged to sisters Dorabella and Fiordiligi, respectively. When the two officers meet the cynical philosopher Don Alfonso, a wager is struck concerning the fidelity of their fiancées. Alfonso devises a scheme to prove to the officers that all women are fickle: the officers will feign leaving for war; soon thereafter returning disguised as suitors pursuing the women. Through the course of the opera, the women are gradually worn down until relenting to the men. The sisters have unknowingly chosen the other's fiancée, and as the double wedding begins, the two men reveal their true identities to the shock of the sisters. As the scheme is revealed to all, the officers grant forgiveness to their fiancées, and both parties resolve to laugh off the entire affair.

ACT 1

❖ Scene 1 – *A coffeehouse*

- Ferrando and Guglielmo are officers at a café, and when talk turns to love, they begin debating with the cynical philosopher Don Alfonso. The officers maintain

that their fiancées are different than other women, and will remain true to them entirely, while Alfonso insists that all women are fickle and unfaithful. He then proposes a wager based around a scheme: the officers will feign leaving for war; soon thereafter returning disguised as suitors pursuing the women. Ferrando and Guglielmo are certain of their success, promptly wishing their fiancées farewell while Alfonso stays behind with the women.

❖ Scene 2 – *A room in the sisters' home*

- Dorabella and Fiordiligi bemoan their loneliness, but their maid, Despina, encourages them to find lovers—just as the men will assuredly do. Alfonso enlists the help of Despina through bribery, and she admits the men. Disguised as wealthy Albanians, the officers begin courting the sisters, much to their displeasure. Despite repeated advances and praising their own good qualities, the disguised officers are unable to win over the sisters. The men grow confident they will win the bet.

❖ Scene 3 – *A garden*

- Despina and Alfonso create a new plan where the young men feign taking poison in an effort to gain the sisters' sympathies. As the officers lay "unconscious" Alfonso calls for a Doctor (Despina in disguise) who resuscitates the men through magnet therapy. The men pretend to hallucinate while opening their eyes, asking for kisses from the goddesses, while Despina and Alfonso encourage the sisters to relent. Again, the women prove to be faithful.

ACT 2

❖ Scene 1 – *The sisters' bedroom*

- Despina makes progress in encouraging the sisters to accept the “Albanians”. The sisters agree that flirtation would be harmless, and Dorabella decides to focus her efforts on “the dark one” (Guglielmo) while Fiordiligi is content with “the fair one” (Ferrando). Unknowingly, they have now swapped lovers.

❖ Scene 2 – *The garden*

- At Alfonso’s suggestion, the couples pair off for a walk in the garden. After some initial shyness, Dorabella proves to be more eager than Fiordiligi; she gives the disguised Guglielmo a medallion with Ferrando’s portrait. Afterward, the brother’s compare notes, and Ferrando is dismayed twofold: Dorabella has proven unfaithful while Fiordiligi continues to resist him.

❖ Scene 3 – *The sisters' bedroom*

- As the sisters reconvene, Dorabella divulges her actions to Fiordiligi, who disapproves. Fiordiligi resolves to find Guglielmo at war, but is intercepted by the disguised Ferrando, and she finally succumbs to his advances. Later, the young men are furious to find their fiancées unfaithful, while Don Alfonso gloats over his successful wager.

❖ Scene 4 – *The wedding hall*

- Preparations for the double-wedding complete, Despina (in disguise as a notary) has the sisters sign a wedding contract. Military music is heard in the distance and Alfonso announces the return of the officers—much to the sisters’ fright. The couples scatter, and when the men return undisguised, the sisters confess all. The

men reveal their own roles, as well as Despina and Alfonso, and all is forgiven. The group decides that it is better to laugh than cry over the surprises in life.

Comparative Plot Analysis

In keeping with the macro perspective of this research, there are some interesting points which can be made when comparing the plots of the Mozart-Da Ponte operas. In both *Figaro* and *Don*, a disruptive event occurs: caused by an abusive, lustful member of the ruling class; spawning chaos, revenge schemes, and disguised identities between the upper and lower classes; and which is ultimately resolved by a return of moral justice. In *Figaro* it is the Count who threatens the purity of the betrothed (Figaro and Susanna), and in *Don* it is Don Giovanni himself who threatens the purity of the betrothed (Don Ottavio and Donna Anna, and later Masetto and Zerlina)—while also committing murder at the start. In *Così*, the formula is altered slightly to be less class-based and more age-based, as the cynicism (or perhaps enlightenment) of old age in Don Alfonso creates the disruptive event in both insult and challenge to the younger officers and their betrothed. In this case, it is the superiority of older age, as opposed to class, which rejects the purity of the betrothed and creates the conflict.

The opening events as described above, in a general sense, are all disruptions of order, and what follows in each case is thus the lack of order—or more specifically, its polar opposite: chaos. The situational comedy and tangle of schemes which constitute the body of each opera are not just humorous, but demonstrative of an imbalanced moral order, as they follow directly from the triggering event. The scales are tipped into a topsy-turvy world of masks and deception, intrigue and shocking reveals; but the commonality among the middles of each opera should not be taken for a lack of importance or analytic worth. In fact, it is through this chaos that important

characterization can occur, and a deeper understanding of each opera can be ascertained. To care for the plot and libretto is necessarily to care for the middle section of the opera as well, and not just the dramatic opening and closing which garner so much analytic and popular attention. That being said, it is only in the complete righting of scales, or the return of order, that ultimate closure can occur; and thus, the events which occupy the center of the work are in some sense incomplete, like scattered reflections of the triggering event, more indicative of the source than the destination.

The resolution of each plot is unique to each opera, and strongly tied to its individual themes, but there are still many similarities to be noted, especially in terms of moments of recognition. In *Figaro*, the Count acknowledges the err of his ways and repents, thereby restoring his relationship to the Countess and removing the threat to the betrothed. In *Don* however, Don Giovanni refuses to recognize the err of his ways (as argued by Jessica Waldoff, and discussed at length in the case study section of this study) and is thus forcibly removed by supernatural intervention.³⁷⁵ In *Così*, Alfonso and Despina are somewhat undermined by the surprising forgiveness between the lovers, and the acceptance of imperfection which allows the couples' love to continue. In all three operas, moral justice is ultimately satisfied, good triumphs over evil, and while forgiveness/repentance produces resolution in both *Figaro* and *Così*, it is the lack thereof in *Don* which necessitates divine intervention. Furthermore, all three operas strongly feature themes of power—whether that be in the mortal realm of social classes, or the ultimate power of the divine realm. It might be concluded that the central thread connecting the Mozart-Da Ponte plots, is that by both repenting and forgiving, characters in some way recognize a higher power and allow for moral order to return. The fact that all three share this tenet is not to

³⁷⁵ Jessica Pauline Waldoff, "The Music of Recognition in Mozart's Operas."

imply that it is the most important theme, or even that it distinguishes these operas from their peers, but to simply point out that when similarities arise it can conversely serve to separate each opera. The Count repents in *Figaro*, the Don rejects repentance in *Don*, and all repent and accept imperfection in *Così*.

Score Analysis

The following score analysis entails an enumeration of all key changes in the Da Ponte trilogy, whether notated or to the relative key. Tonicizations and brief forays are thus not represented here, but such local details will be treated later by the Key Strength feature in the application Sonic Visualiser. Combining a manual score analysis with a computational one allows the latter to be corroborated, but also offers two contrasting levels of detail. In keeping with the spirit of the above discussions on plot, brief descriptions of the narrative are also given for each number as a way to contextualize what would otherwise be a rather dry representation of the works.

Table 5.1. Key Changes in *Figaro*

Le nozze di Figaro						
Act	Number	Type	(Alt.) Key	Modulation	Plot	
1	-	Overture	D		-	
	1	Duet	G		Susanna tells Figaro she dislikes their new room's location	
	2	Duet	Bb		Susanna reveals the Count's intentions to Figaro	
	3	Cavatina	F		Figaro vows revenge. Bartolo and Marcellina hatch their plan	
	4	Aria	D		Bartolo relishes to avenge past wrongs committed by Figaro	
	5	Duet	A		Susanna and Marcellina verbally duel until Cherubino enters	
	6	Aria	Eb		Cherubino implores Susanna to intercede on his behalf	
	7	Trio	Bb		Cherubino overhears the Count's advances on Susanna	
	8	Chorus	G		Figaro intercedes with peasants celebrating the virtuous Count	
	9	Chorus	G		The Count sends Cherubino away to a military officer position	
2	10	Aria	C		Figaro falsely encourages Cherubino, but secretly tells him to stay	
	11	Cavatina	Eb		The Countess, Susanna, Figaro, and Cherubino hatch their plan	
	12	Aria	Bb		Cherubino ponders love. The women disguise him as a woman	
	13	Aria	G		Cherubino hides in a closet as the Count enters	
	14	Trio	C		The Count angrily interrogates the Countess and plans to return	
	15	Duet	G		Susanna exchanges places with Cherubino. The Countess confesses	
	16	Finale	Eb	Bb/G/C/F/Bb/Eb	The Count resolves to investigate Marcellina's contract	
	3	17	Duet	Am	A	Susanna agrees to the Count's advances and relays this to Figaro
		18	Acc. Recitative	Aria	D	The Count overhears the lovers and rages at their deception
		19	Sextet	F		Bartolo and Marcellina discover they are Figaro's parents
20		Acc. Recitative	Aria	C	The Countess holds onto hope. Antonio reveals Cherubino's lie	
21		Duet	Bb		Susanna and the Countess scheme and devise a letter for the Count	
22		Chorus	G		Cherubino is discovered but Barbarina requests him in marriage	
23		Finale	C	Am/C	The double wedding occurs. Susanna passes the note to the Count	
4		24	Cavatina	Fm		Figaro discovers that Barbarina has lost Susanna's gift for the Count
		25	Aria	G		Figaro assumes Susanna's infidelity, but Marcellina disagrees
	26	Aria	Bb		Figaro discusses his vengeful plans with Basilio and Bartolo	
	27	Acc. Recitative	Aria	Eb	Figaro bemoans his situation and eavesdrops on Susanna	
	28	Acc. Recitative	Aria	F	Susanna tricks the hidden Figaro and feigns infidelity	
	29	Finale	D	G/Eb/Bb/G/D	All mistaken identities are revealed and love is rekindled by all	

Table 5.2. Key Changes in *Don*

Don Giovanni						
Act	Number	Type	(Alt.)	Key	Modulation	Plot
1	-	Overture		Dm	D	-
	1	Introduction	Quartet	F		Giovanni kills Commendatore in a duel after pursuing Anna
	2	Acc. Recitative	Duet	Dm		Anna and her fiancé, Ottavio vow revenge against the perpetrator
	3	Aria	Trio	Eb		Giovanni is recognized by a bitter former lover, Elvira
	4	Aria		D		Leporello begrudgingly distracts Elvira with a list of Giovanni's exploits
	5	Chorus	Duet	G		Zerlina and Masetto are celebrating their wedding among peasants
	6	Aria		F		Masetto is embittered after Giovanni's advances push him aside
	7	Duet		A		Now alone, Giovanni presses the reluctant Zerlina
	8	Aria		D		Elvira rescues Zerlina and rebukes Giovanni
	9	Quartet		Bb		Elvira's rebukes draw Giovanni away from Ottavio and Anna
	10	Acc. Recitative	Aria	D		Anna believes Giovanni is the perpetrator. Ottavio is uncertain
	10a	Aria		G		Ottavio emphasizes his love and loyalty for Anna
	11	Aria		Bb		Leporello has set up the party. Giovanni envisions the coming exploits
12	Aria		F		Masetto questions Zerlina's fidelity. She denies his accusations	
13	Finale		C		Giovanni fails to frame Leporello for assaulting Zerlina, and flees	
2	14	Duet		G		Giovanni and Leporello trade disguises in order to seduce Elvira's maid
	15	Trio		A		Leporello (as Giovanni) leads the reluctant Elvira away
	16	Aria	Canzonetta	D		Giovanni sings a serenade alone until Masetto arrives with friends
	17	Aria		F		Giovanni (as Leporello) disperses the throng and beats up Masetto
	18	Aria		C		Zerlina soothes Masetto and chides his jealous ways
	19	Sextet		Eb	D/Cm/Eb	Leporello is forced to reveal his identity to those pursuing Giovanni
	20	Aria		G		Leporello pleads for mercy as an innocent servant, and flees
	21	Aria		Bb		Ottavio vows revenge. Elvira holds onto lingering affection
	21a	Duet		C		Zerlina angrily binds Leporello, who later frees himself
	21b	Acc. Recitative	Aria	Eb		Elvira agonizes over her conflicting emotions toward Giovanni
	22	Duet		E		Giovanni forces Leporello to invite Commendatore's animated statue
23	Acc. Recitative	Rondo	F		Anna cannot consider wedding Ottavio until her father is avenged	
24	Finale		D	F/Bb/F/Dm/G/D	Giovanni is dragged to Hell. All celebrate freedom in his absence	

Table 5.3. Key Changes in *Così*

Così fan tutti						
Act	Number	Type	(Alt.)	Key	Modulation	Plot
1	-	Overture		C		-
	1	Trio		G		Alfonso angers the soldiers by claiming all women to be fickle
	2	Trio		E		Alfonso proposes a wager to prove the men's betrothed are unfaithful
	3	Trio		C		Ferrando and Guglielmo accept the wager with confidence
	4	Duet		A		The sisters happily think of their betrothed until Alfonso enters
	5	Aria		Fm		Alfonso feigns the bad news that the soldiers are called off to war
	6	Quintet		Eb		The men console the distressed sisters, and all curse fate
	7	Duet		Bb		The men bid farewell to their lovers as a boat arrives to shore
	8	Chorus		D		A chorus of sailors decries the futility and constancy of war
	9	Chorus		D		The lovers bid final farewell and their ship departs
	10	Trio		E		The remaining trio hope fate is kind. Alfonso goes to receive the men
	11	Aria		Eb		The sisters grieve inconsolably to their maid, Despina
	12	Aria		F		Despina advises them to be as fickle as men. Alfonso bribes Despina
	13	Sextet		C		The "Albanians" are introduced much to the sisters' displeasure
	14	Aria		Bb		Fiordiligi commits herself to a steadfast love
	15	Aria		G		Guglielmo unsuccessfully courts the sisters
	16	Trio		G		The soldiers gloat before Alfonso
	17	Aria		A		Ferrando muses on the restorative power of hopeful love
18	Finale		D		The men fake suicide to rouse the affection of the resolute sisters	
2	19	Aria		G		Despina tells the sisters to use love as a persuasive weapon
	20	Duet		Bb		They concede to benign flirtation, unaware they have swapped lovers
	21	Duet	Chorus	Eb		Ferrando and Guglielmo muse on love in the gardens
	22	Quartet		D		The lovers pair off. Dorabella is more open than Fiordiligi
	23	Duet		F		Dorabella yields to Guglielmo and gives him her locket of Ferrando
	24	Aria		Bb		Ferrando unsuccessfully courts Fiordiligi
	25	Rondo		E		Privately, Fiordiligi struggles to maintain her loyalty
	26	Aria		G		Guglielmo sympathizes with shocked Ferrando and deplores infidelity
	27	Cavatina		Cm	C	Ferrando's love remains despite betrayal
	28	Aria		Bb		Dorabella tells Fiordiligi to acquiesce, for love gives and takes at will
	29	Duet		A	C/A	Fiordiligi plans to flee after Guglielmo but finally relents to Ferrando
	30	Trio		C		Alfonso tells the men to accept disloyalty and marry the sisters
	31	Finale		C	Eb/E/D/Eb/Bb/C	The scheme is revealed and all is forgiven with laughter

Feature Extraction

As described in the Methodology section, feature extraction and visualization of data are handled by the applications jMIR and Sonic Visualiser, respectively. The following eight figures are the results of this process, and can be grouped into three sets: the first set (Figures 5.8 and 5.9) shows the waveform, or amplitude over time; the second set (Figures 5.10 through 5.12) shows the Key Strength plot, or clarity of key over time; and the third set (Figures 5.13 and 5.14) shows the feature extraction, or the standardized feature values for each audio track. For each set, trends have been marked in an effort to represent the general shape and articulation points of the data, so that they can ultimately be combined and examined for coordination in Figure 5.15.

Each of the eight figures are displayed over the same depiction of the operas, with thick vertical lines for each act and thin vertical lines for each number. These markers are placed according to their precise occurrence in the MusicAeterna recordings. Incidentally, the recordings of *Figaro* and *Così* are of nearly identical overall run-time (2:56:33 and 2:57:39 respectively) whereas *Don* is slightly shorter (2:50:09); and given the macro perspective of the figures, this causes both *Figaro* and *Così* to appear equivalent in length, while *Don* ends distractingly short. This is noted more for clarification than to address any real issue, as all the operas are of readily comparable length, and having exactly equivalent lengths presents no real analytical benefit.

Figure 5.8. Audio waveforms of the Mozart-Da Ponte operas

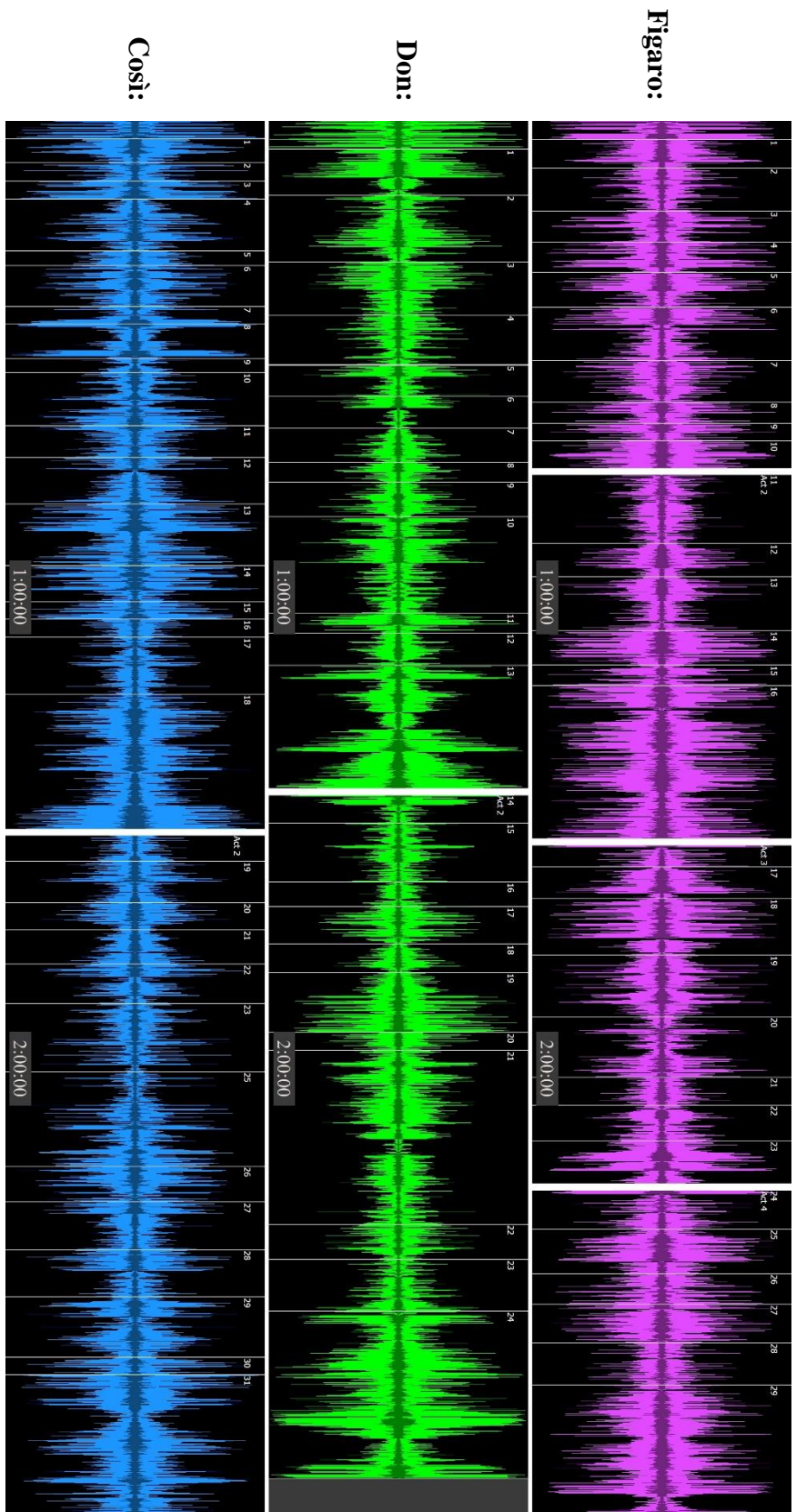


Figure 5.9. Trends superimposed on audio waveforms

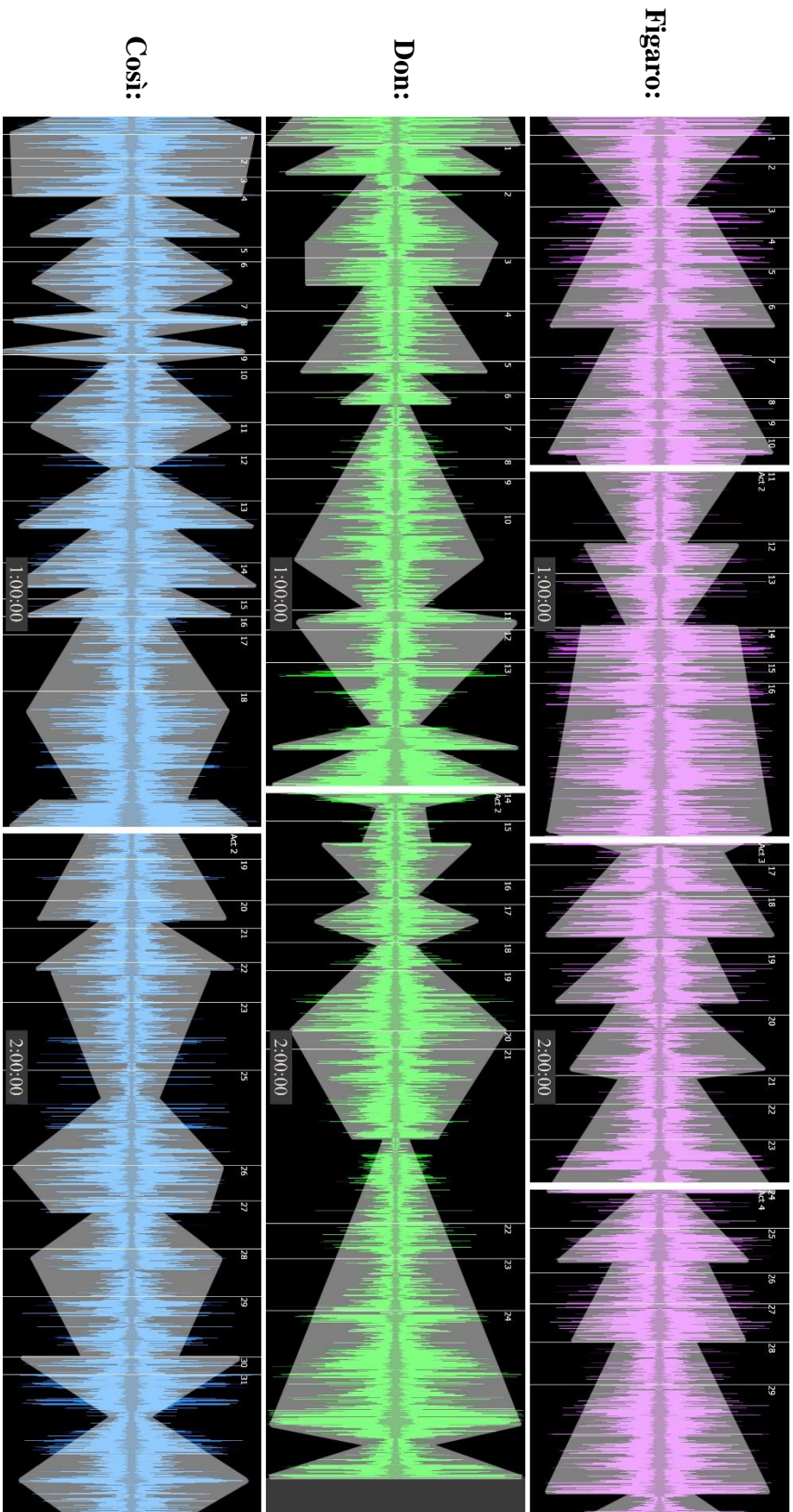


Figure 5.12. Trends superimposed on Key Strength Plot

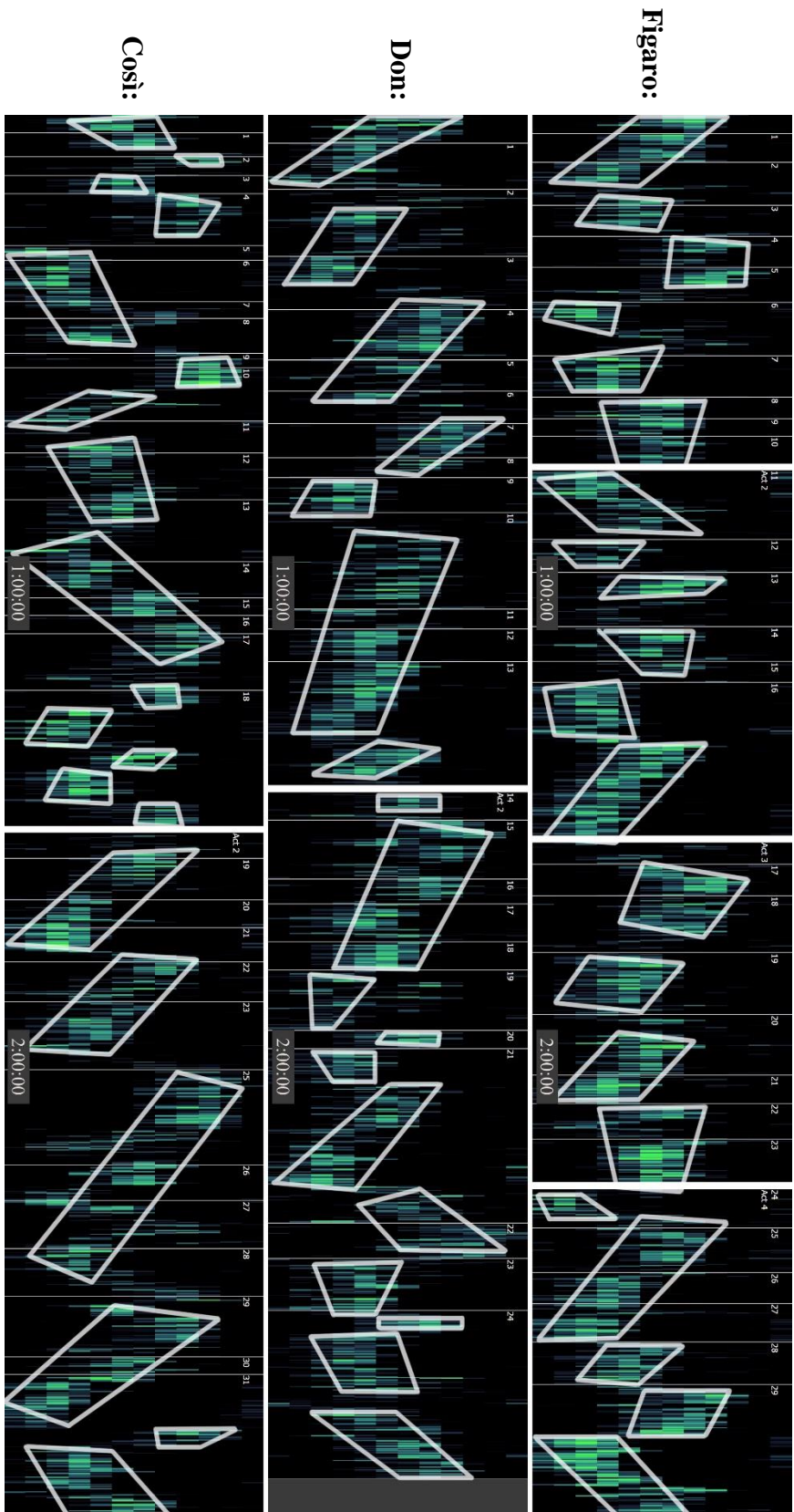


Figure 5.13. Feature extraction of the Mozart-Da Ponte operas

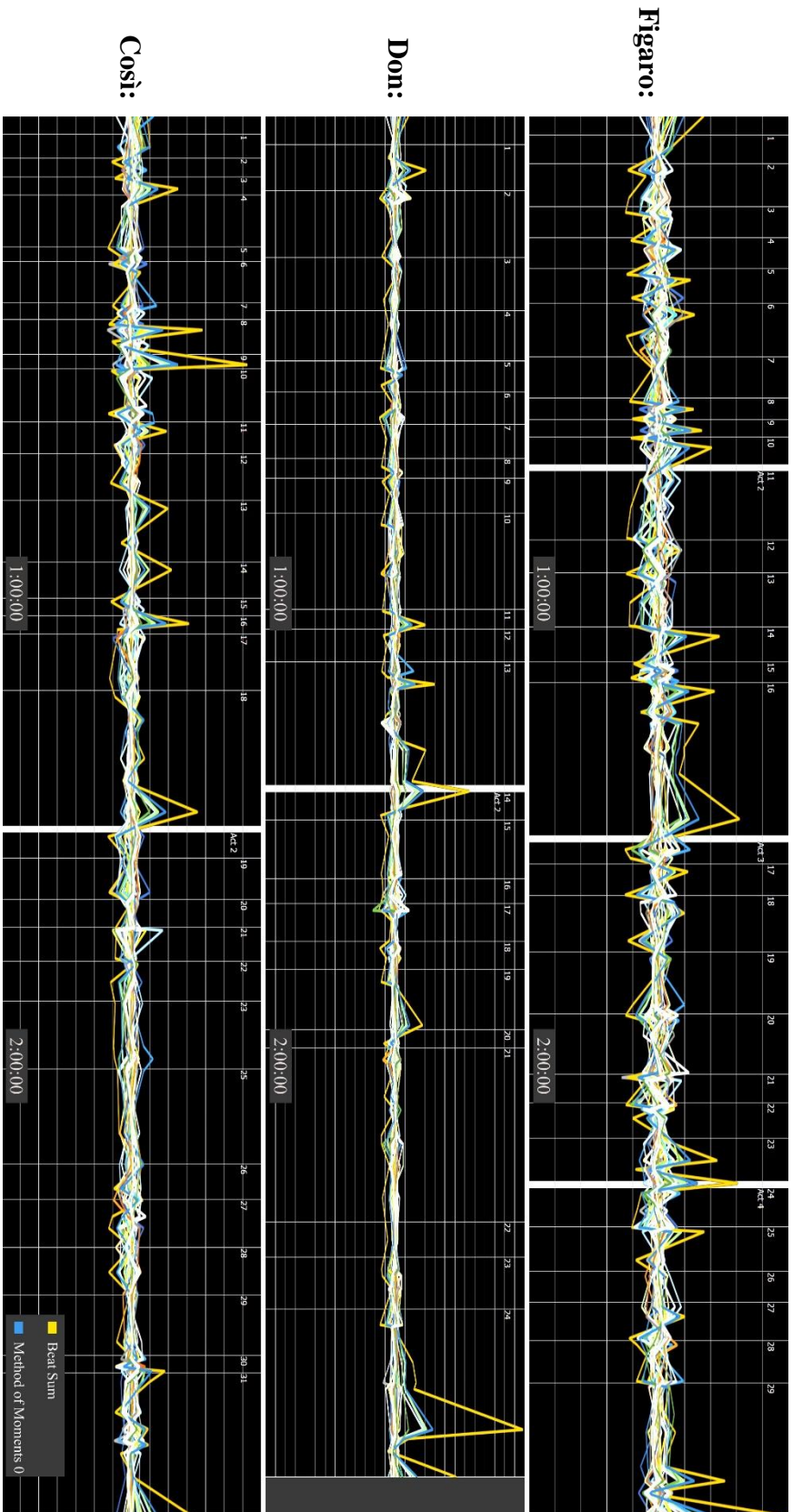


Figure 5.14. Peaks of “Beat Sum” marked on the feature extraction

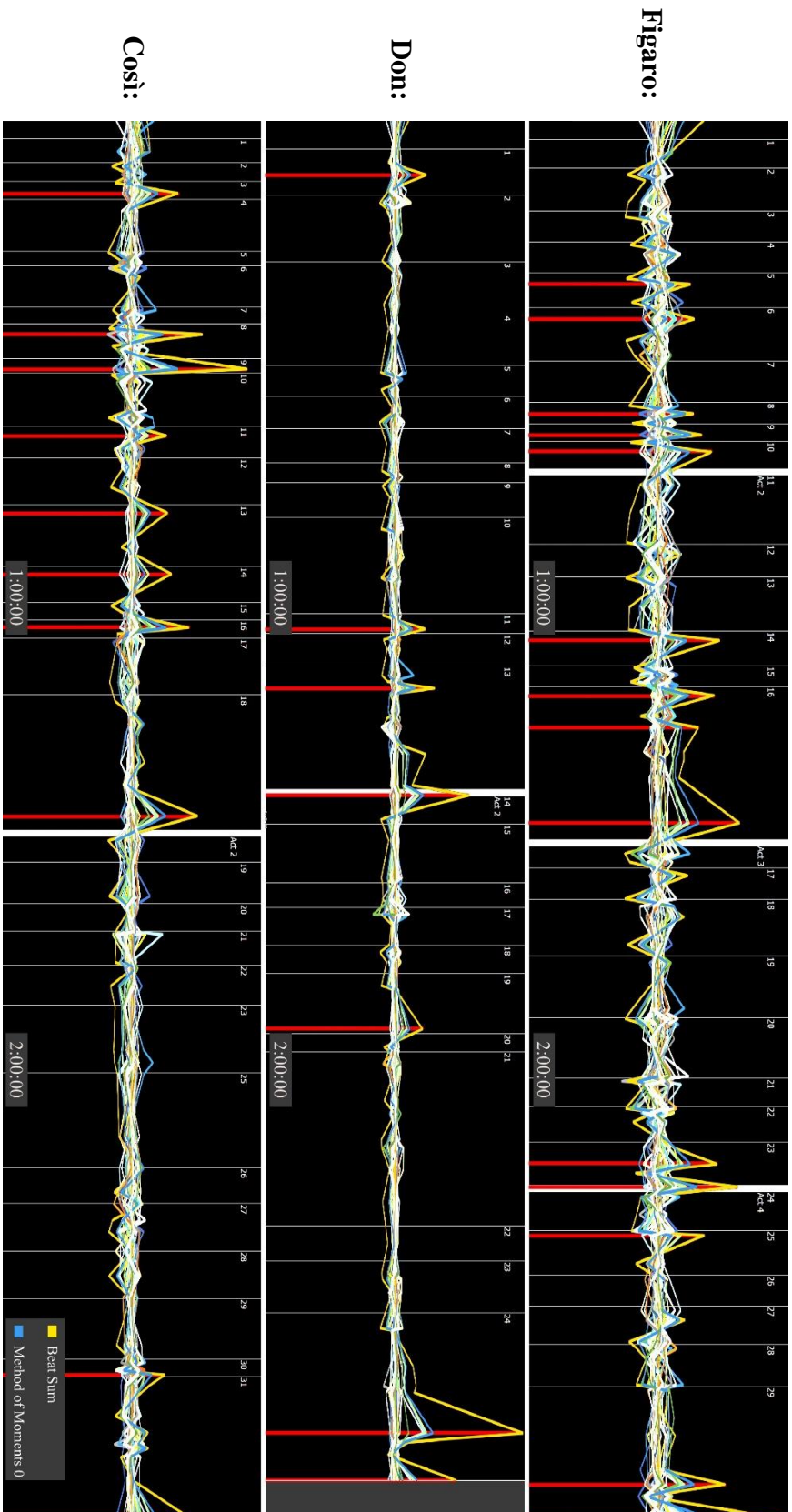
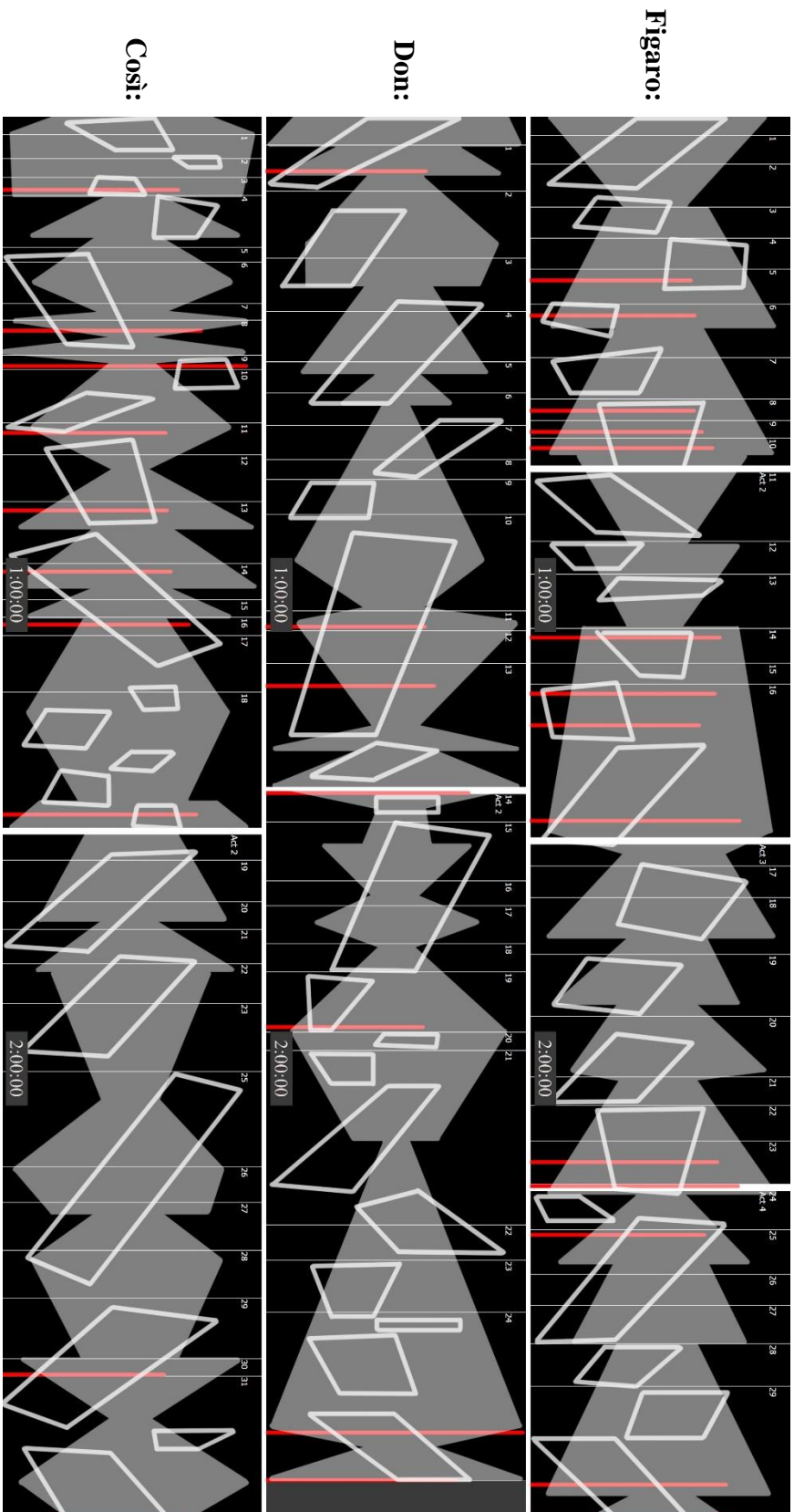


Figure 5.15. Waveform trends, Tonality trends, and Feature Extraction peaks superimposed



Discussion

Beginning with Figure 5.8 of the audio waveform, there are a few characteristics to note in what is otherwise a rather familiar image. First, the waveforms show great variety, with sudden and frequent juxtapositions of loud and soft sections appearing throughout the works—as one might expect from the basic structure of recitative and aria. The operas also resemble each other closely in terms of waveform, with loud closings for each act except in cases of brief epilogue-like sections, such as the end of *Don* Act 2. No waveforms appear to have a macro formal trajectory (arch, ascending, descending etc.), but there are some interesting mid-level trends which take place over multiple numbers, as marked in Figure 5.9. Especially in light of Zeiss’ permeability concept and argument for more mid-level analysis in general, the use of amplitude to delineate such mid-level structures may be a concept fruitful for future research.³⁷⁶ It should be noted that the trends drawn over Figure 5.9 (as well as 5.12 and 5.14) have been executed by hand, and should not be taken for calculated and quantitative measures, but as analytic judgements. Of course, there are many statistical options which one could choose from for trends and grouping, but the point here is to represent the data in a simplified format so that it can be superimposed in Figure 5.15. In short, it is more demonstrative than quantitative.

Moving on to the Key Strength figures (5.10 through 5.12) there is again a great deal of consistency both through an individual work and amongst the three. These figures are of special importance to the present research given that they are novel approaches to tonal planning based upon computational feature extraction. To reiterate, the plots show “merged” key strength, meaning that the major and minor modes are merged, with more vivid green coloring indicating greater key clarity. This means that the x-axis (which represents time) is centered at zero

³⁷⁶ Laurel Elizabeth Zeiss, “Permeable Boundaries in Mozart’s ‘Don Giovanni.’”

accidentals (C major and A minor), while the y-axis extends to +/- six accidentals at either end, and any green blocks occurring within the plot indicate that the corresponding keys have been identified. For example, the ends of each opera exhibit ascending fifth motion, as can be seen by ascending steps of green blocks.

Perhaps the most exciting part of Figure 5.10 is that one can clearly make out segments which are smoothly connected, extending through multiple numbers (and recitatives), and forming shapes which ascend, descend, and form rough arches, waves, and so on. It is remarkable to see how consistently tonal motion occurs between adjacent keys, with remote jumps marking the start of a new segment of keys, whereupon the process repeats again. This data visualization profoundly aligns with both Platoff and Webster (namely, that close motion connects a segment, distant motion begins a new one, and that this articulation is a critical aspect of tonal planning) while also making the process more readily apprehensible. In comparison, the manual score analysis which is overlaid in Figure 5.11 obscures this process entirely. While the white line which represents the manual analysis is clearly in agreement with the results of the feature extraction—its inability to account for recitative, and other, transitory tonicizations, combined with its implicitly contiguous representation as an unbroken line—results in what might incorrectly be regarded as a rough sinusoid. As Webster argues, “analysis equals interpretation”³⁷⁷; and thus, the decision in Figure 5.12 to remove the manual analysis line and create segments based upon the Key Strength plot alone is also necessarily to interpret tonal movement as a fundamentally segmented entity.

The third set of figures (5.13 and 5.14) show the standardized results of the 26 features extracted by jAudio, with each line representing a different feature. Since the feature extraction

³⁷⁷ James Webster, “Understanding Opera Buffa: Analysis = Interpretation.”

is dimensionally reduced by taking averages on a per-track basis, their lines can be seen to vary multiple times within some numbers, and especially the longer ensembles. Given that the bounds of each audio track are particular to the MusicAeterna recordings, tables can be found in the Appendix section which detail the exact location and duration of audio tracks within the operatic structure. Lastly, it should be restated that the various features normally exhibit different magnitudes and units, but have all been scaled to the same range and distribution so that they can be appropriately compared on the same graph.

On initial observation of Figure 5.13, there is, again, a readily apparent similarity both through the course of a single opera, and across all three. As this has now been observed in each analyzed domain—waveform, tonality, and feature extraction—one can at least conclude that the operas broadly resemble each other in many different manners. But what is perhaps most striking in Figure 5.13, are the prominent and infrequent peaks of the gold line, which are followed to a lesser extent by the light blue line, representing “Beat Sum” and “Method of Moments” (0th order), respectively. The other features are relatively consistent throughout, without any notable departures from the central region, and so it is in Figure 5.14 that the most pronounced peaks of Beat Sum are marked with vertical red lines. Since many features rise somewhat along with Beat Sum, but none so much as Method of Moments 0, the red lines not only represent Beat Sum’s peaks, but also general peaks across the other features—foremost among which being Method of Moments 0. As such, these two significant features will be reviewed prior to discussing the locations of the peaks themselves, so that their positioning can better be understood.

Beat Sum is a measure of rhythmic clarity. A temporally-related feature, it is the overall sum of the beat histogram, and thus may also be understood as a total account of beat strength. Recalling that a beat histogram features tempo on the x-axis and beat strength on the y-axis, one

would expect that peaks on the histogram correspond to the tactus and its various integer multipliers and divisors. A higher Beat Sum therefore means that the musical material exhibits clearer rhythmic organization, regardless of the distribution of that organization. Method of Moments 0th order is a measure of the area of the magnitude spectrum. Similarly to Beat Sum, this accounts for the overall clarity or prevalence exhibited by the signal, but here it is in terms of magnitude instead of tempo. Method of Moments is a vector with five coefficients (or, 0th to 4th order) which each describe a different aspect of the magnitude spectrum: area, mean, density, skew, and kurtosis. If the magnitude remains unchanged in average and distribution, but increases in area, then this means the prevalence of magnitudes must increase uniformly. But what this translates to in terms of listener perception is difficult to say; and furthermore, simplifying either Method of Moments or Beat Sum to the point that they are music-specific terms would be to misconstrue them. They are both low-level features clearly defined in the computational domain, yet somewhat abstract in the musical and perceptual domains. It may simply be stated that Beat Sum is related to temporality while Method of Moments 0 is related to magnitude, and in both cases, they are aggregate measures of clarity and prevalence.

The easiest and most significant observation to make regarding the location and prominence of peaks in Figure 5.14 is that very pronounced peaks occur at the culmination of finales. Each of the finales is marked by at least one peak, with many finales showing peaks throughout; so even without the structural lines for acts and numbers drawn in, one may still discern the placement of acts. The finding that, without fail, the Mozart-Da Ponte operas exhibit peaks in Beat Sum and Method of Moments 0 near the end of finales is a significant result for the present research. In all the preceding figures, nothing approaching a structural articulation at the macro scale could be found. And while the mid-level trends exhibited in waveform and tonality

should not be understood as of lesser importance than what “macro” may imply, it is critical to note a finding at so surprising a scale of analysis. Given the importance of this finding, further discussion on the placement of peaks is warranted, which will then be followed by a discussion connecting them to the broader theories of perception introduced in the “Psychology of Listening” section of the present study.

Aside from peaks at the culmination of finales, there are a number of “other” peaks which must be examined. Though not terribly common across the operas, these peaks are most prevalent in the first acts of *Figaro* and *Così*—with the latter exhibiting a truly ponderous number of non-finale peaks: seven. Of these, most are of moderate prominence (the peaks occurring in opera numbers three, eleven, thirteen, fourteen, and sixteen), while the peak in number eight is nearly of finale-level prominence, and that in number nine is *above* the prominence of its corresponding finale. As a possible explanation for this, one might look to the apparent correlation with ensemble writing, since in each of the above cases the writing is for ensemble: number three is a trio, number eleven’s recitative is a trio, thirteen is a sextet, fourteen’s recitative is a quintet, and sixteen is a trio. Furthermore, the two highest peaks, numbers eight and nine, are both for chorus with ensemble recitatives. This correlation can be found in the other operas as well; the Act 2 sextet of *Don* garners a peak, as do the choruses in numbers eight and nine of *Figaro*. But the relationship between ensembles and peaks is not guaranteed—many times the two do not cooccur, and with greater forces on stage the peaks are not always correspondingly higher. In short, the presence of ensemble writing increases the likelihood of a peak, but does not guarantee it, and so it stands to reason that other aspects of the music are contributing factors. Given that the features in question are aggregate measures of rhythm and dynamic, it is the clarity and prevalence thereof which must be expressed. And

considering that finales generally feature a boisterous tutti texture with driving rhythms, metric clarity, accented articulations, and so on, it should be not altogether surprising that peaks of Beat Sum and Method of Moments 0 can be observed. With the increased complexity of ensemble writing, both rhythmic and dynamic forces tend to be more prominent as well, as they provide structure and organization to the various vocal lines.

The cognitive perceptibility of peaks in a low-level feature extraction cannot be assumed, but as Beat Sum and Method of Moments in particular are related to local rhythmic and dynamic characteristics, a plausible connection to cognitive perception theories can be made. Beginning with Deliège and extending to innumerable other studies, the cue abstraction model describes how listeners identify and store distinctive features from the musical stream, engaging in a process of recall and comparison through the course of a piece, and ultimately creating some type of auditory image or mental schema to represent its entirety. A more thorough account of these studies, as aforementioned, can be found in the “Psychology of Listening” section; but at present, the study by Addessi and Caterina in particular will be reiterated in the context of feature extraction peaks.

Investigating cue abstraction with post-tonal music reveals how listeners resort to dynamics, duration, speed, and timbre to provide cues.³⁷⁸ But even with hierarchical harmonic, melodic, and rhythmic structures present, Addessi and Caterina find that listeners are more sensitive to surface similarity features when segmenting and constructing a mental macroform; and thus, features like contrast, discontinuity, change, and repetition can supersede syntax.³⁷⁹ This challenges the conventional belief that pitch-based features, like tonal planning, provide

³⁷⁸ Anna Rita Addessi and Roberto Caterina, “Perceptual Musical Analysis: Segmentation and Perception of Tension.”

³⁷⁹ Addessi and Caterina, 33-34.

macro structure for listeners, and instead emphasizes features related to surface similarity. With sudden and pronounced peaks in *Beat Sum* and *Method of Moments* (rhythmic and dynamic characteristics respectively) marking the presence of ensemble writing in general and finales especially—these peaks may provide a formal musical cue for listeners. The perceptibility of these features would have to be determined in empirical research outside the present scope, but peaks in the feature extraction would be analogous to prominent surface features relevant for cue abstraction. Using psychology to validate computational music theories is certainly attractive, but again, not strictly necessary. Whether these peaks are perceptible to humans is beside the point that they are perceptible to computers, and by engaging in the digital domain to conduct research, one has necessarily presupposed the justification of the domain itself.

Returning to the figures above, the final one, Figure 5.15 remains to be discussed, as it is the superimposition of all three trends thus far marked: waveform, tonality, and feature extraction. On observation, the coordination of the three analyses appears to be loose but extant. For instance, the non-finale peak in *Figaro* number fourteen occurs simultaneously to new segments in both waveform and tonality, while the ensuing two peaks are roughly aligned with corresponding segments in waveform. In fact, a vast majority of peaks can be aligned with some segment—whether waveform, tonality, or both—lending support to the notion that they are structural articulations. The coordination between waveform and tonality appears much looser, with only occasional alignments amidst what is otherwise two independent measures. As the trends in both cases appear more mid-level than macro, it seems natural that coherence most often occurs only at structural points with feature extraction peaks. Overall, the rough coherence exhibited by Figure 5.15 is in many ways more encouraging than if it appeared absolute, for the

analytic and perceptual engagement with the operas is truly multifarious—lending any measure imposing grand simplicity an air of incongruity.

CHAPTER 6: CONCLUSION

The present study has considered opera multivalently through its various domains of existence (such as score, cognition, and society), while also engaging its various and overlapping domains of communication (such as plot, text, and music). As this has necessitated a broad and interdisciplinary approach across the fields of music theory, musicology, aesthetics, psychology, and computer science; the choice of specific materials—the Mozart-Da Ponte operas—has provided for focus and direction. In assuming each disparate perspective, corresponding meanings have been allowed to emerge, leading repeatedly to the conclusion that each is but a mere reading of infinite meaning. Just as light casts shadow, manner of approach dictates what is seen and what is concealed. To reiterate a prior point: theorists see notes, musicologists see people, psychologists see minds, linguists see words, philosophers see aesthetics, computers see data, and so on. But to a much greater magnitude than what each perspective sees, is the concealed expanse of unconsidered thought lying necessarily beyond that view. In this sense, a multivalent analysis is no more comprehensive than a narrow analysis, as relative to infinity all are levelled to be but single readings. A crucial aspect of this specific reading is the use of low-level feature extraction to facilitate the macro analysis of the Da Ponte trilogy; the results of which can be understood through the multivalent lens reiterated below.

Topics are musical characteristics which connect to some aspect of life, such as music of the hunt, learned style, or pictorialism.³⁸⁰ Topic theory reveals how musical features which are referential to era-specific social constructs can easily go unrecognized by modern audiences. This is because topics are intramusical features which refer to extramusical meanings, and they require a beholder to which the reference is known; that is, topics can be seen as part of a

³⁸⁰ Ratner, *Classic Music*.

tripartite semiotic paradigm—symbol, reference, beholder.³⁸¹ This paradigm, and the transmutability it imparts, is highly susceptible to the loss of intended social meaning, and is common not to topics alone, but to any aspect of music which is specific to era or culture. The precise and profound ease with which historical audiences enjoyed social references cannot be truly replicated, as many concepts have no exact analogs, and accordingly suffer translation with some degree of cultural noise. The written, musical score is thus not a whole and bounded object, for the social meanings it may impart reside at least partially in the audience, or social context, which not only births, but beholds its progeny.

An archetypal example of such poor translation is the Enlightenment concept of “noble simplicity,” which supports stoicism as appropriate for innate, high-born superiority.³⁸² The notion that high-class individuals are superior in character and morals is not just anachronistic in the modern context, but offensive as well, rendering it challenging to see as a positive trait. The character Don Ottavio in *Don Giovanni* is an exemplar of noble simplicity—but either due to a lack of awareness of noble simplicity, or else a mistranslation of it—Ottavio has frequently been regarded as ineffectual in opera criticism and productions alike. The weak and passive Ottavio who pales against Don Giovanni can be radically retranslated as a self-assured and morally upright counterbalance to the Don (the former acts according to high station while the latter against it), if one simply accounts for noble simplicity. That a reading for Ottavio which is not only comprehensible, but favorable, may emerge from the details of contextual analysis, and subsequently alter dramatic interpretation, lends great significance to the infinite array of other details which can never be fully apprehended. Though unseen, the significance of the unknown

³⁸¹ Agawu, *Playing with Signs*.

³⁸² Hunter, *Mozart's Operas*, 211-212.

cannot be disregarded in even the most immutable aspects of a work, which though like stone in likeness, are mere apparitions among the shadowed void.

Another aspect of Mozart's work more given to loss is the pervasive use of syntactical play, and the meaning it provides, which is only available to those listeners aware of stylistic conventions. The established norms for each formal function (beginning, middle, and end) allow Mozart to play with listener expectation by placing material in opposition to its formal function.³⁸³ Otherwise known as formal dissonance, it reveals Mozart as a composer delighting in convention and raising it up through play; he invites listeners into a game of deception, much like exploring a Carnival world together. Opposite to this game of syntax and deception are the themes of knowledge and self-discovery running through Mozart's operas, allowing recognition to emerge from the murky unknown. Elevating deception has a corresponding effect on recognition, which is often marked with sudden shifts, or discontinuities in the music. While moments of recognition (identity, purpose, self-awareness, and so on) are demarcated with double bars, fermatas, or shifts in tempo and dynamic; longer scenes of recognition feature shifts in any number of musical terms, and even overall style.³⁸⁴ Mozart's operas can be seen in this manner as vehicles of discovery, or demonstrations of knowledge found—not just for the characters on the stage but for the audience as well, and the real world they inhabit. Both recognition and deception are themes of knowledge which pervade Mozart's operas, and serve to connect them to the Enlightenment in general.

The hypothetical task of musical translation which has prompted the present study, has in some sense already been enacted through each subsequent operatic production over the centuries. By interpreting the equally valid versions of each opera, the history of the world depicted in the

³⁸³ Harwood, "Subversive Strategies."

³⁸⁴ Waldoff, "The Music of Recognition in Mozart's Operas," 9.

opera itself, and the question of Mozart's true intentions; productions continually shape, translate, and disrupt the notion of fixed meaning in opera. Context and content imprint themselves on the other, shifting through time like a living and inseparable history which is invoked in any analysis, no matter how ostensibly extra- or intra-musical in nature. Without context, one might easily miss that the characters Figaro and Susanna originate from the *commedia dell'arte* tradition (Harlequin and Columbine respectively), or that the opera *Figaro* itself is a sequel to Paisiello's popular *Barber of Seville*, and thus designed to curry favor with the Viennese audience in particular.³⁸⁵ Without content, one might easily miss the discursive and periodic surface of classical music, the rhythmic patterns of speech particular to each character,³⁸⁶ or—specifically relevant to the present study—the dramatic structure articulated by segments of tonal regions. But especially pernicious, are those features which overlap context and content, or else resist the systematized understanding privileged by formalist approaches, and are thereby marginalized by the practice of valorizing only that which is explicable. For instance: Mozart's referential use of instrumentation to invoke contemporary *Harmoniemusik* ensembles is predicated on how readily timbre lends itself to associative purposes;³⁸⁷ and Mozart's choice between compound-ternary and compound-binary aria forms depends on whether the first or second stanza of text is more relevant to the action that follows.³⁸⁸ In both examples, meaning is only revealed across multiple domains, and it is to this type of understanding that multivalent analysis is most oriented.

In the history of criticism, analysis which appeals to modern taste is often given preferential value, overlooking how dusty materials are often amenable to cobwebbed beliefs. As

³⁸⁵ Hunter, 111, 118.

³⁸⁶ Cooper, "The Virtue of Recitativo Semplice."

³⁸⁷ Halpin, "The Wind Band in Mozart's Opera Orchestra."

³⁸⁸ Carter, "Two into Three Won't Go?" 238-241.

stated before, the forward nature of time cannot be mistaken for progression, as the yawn of eons equally produces decay and rot; but occasionally, there yet remains a dim, argent gleam beneath the patina of centuries, and it is to this the eye must be attendant. The notion of key characteristics, for instance, is highly doubtful in the modern context, but this is irrelevant to the fact that belief in them was so historically pervasive that disregarding their analytic significance today is deleterious.³⁸⁹ Using the same lens as the historical composers, performers, and audiences who believed in key characteristics is more fruitful for analysis than arguing its incongruity to reality.

Tonal planning is another concept which may call forth antediluvian claims—here, of grand design—but where key associations can be viewed in a historical context, tonal planning can be redirected to more critical thought. In particular, the structure of the drama can provide a more useful starting point to analysis than the score, since it reveals tonal plans as referential to the drama instead of to purely musical, or instrumental forms.³⁹⁰ Furthermore, the reduction of tonal motion into just two, basic types—distant and near—reveals that distant-key movement is used sparingly, while near-key movement is the norm. A series of adjacent, near-key moves thus creates a tonal region, or segment, which is terminated by a distant-key move. The presence of near-key moves often connects dramatic set-pieces, while a move to a remote key articulates a new dramatic segment. A new segment may occur at the shift from one subplot to the next, a startling revelation, a change of scene, character exits, and so on; however, this is not to imply that tonal planning alone is responsible for marking dramatic structure. Discontinuities in other musical features, like texture, orchestration, or dynamics, can also serve this purpose, thereby creating segments in their own respective domains. Tonal planning in this sense becomes a

³⁸⁹ Steblin, “Key Characteristics in the Eighteenth and Early Nineteenth Centuries,” 250.

³⁹⁰ Platoff, “Tonal Organization,” 392-393.

connection between the segments of tonality and the segments of separate domains; and it is the relationship of these segments with the drama that constitutes the analysis.³⁹¹

It is crucial to note that the cohesion of separate domains—or, the coordination of their segments—cannot be taken as a positive trait. To apply value judgements in this manner is to slip surreptitiously back into formalism, and assess a work based on the agreement of its parts. The operatic experience is multifarious, and when separate domains work against each other, are misaligned, or else ponderous in some manner, the result is often more ambiguous and provoking than if completely coordinated. The multivalent analysis of separate domains is a key feature of the present work, which promotes computational feature extraction as a novel domain to be explored. The potential for segments to occur within the feature extraction, and to be subsequently related to segments in the other domains, can be seen as an augmentation of tonal planning with the digital domain. Features are measures of various aspects of the audio waveform, and are often only roughly translatable to conventional parameters in music theory. This has often raised the same questions of perceptibility which have plagued tonal planning, while continuing the tacit belief that to be perceived by a human is to also be significant. The present study holds that there is no innate aesthetic value in perceptibility (nor even artistic creation, or *poiesis*), and that to approach a work in these manners is not to ensure its worth.³⁹² The question of perception, addressed below, is thus not a way to validate feature extraction, tonal planning, or whatever else may be considered unheard, but to acknowledge the significance of the listener's domain.

The integration of music perception theories which describe the cognitive listening process, with music theories which describe the music itself, can be seen as an attempt to unify

³⁹¹ Webster, "The Act IV Finale," 99.

³⁹² Horn, "Tonality, Musical Form, and Aesthetic Value," 224.

the cognitive and score domains. That the two are not equivalent, and that what appears significant in one domain may not translate to the other, is a point which has continuously been made in this study. A comprehensive theory which covers both domains and enjoys any semblance of consensus simply does not exist; and whether or not it is even possible, the benefit of doing so remains unfounded. The goal of the present study is thus more to bridge the divide, or to facilitate comparative understanding, in much the same way as the various domains of information (like plot, text, and music) illuminate each other. A probabilistic model of cognition, such as that proposed by Leonard Meyer, emphasizes how expectations and uncertainty shape musical experience; and furthermore, how style is a mental construct, or a system of probabilities used to perceive meaning.³⁹³ Alternately, a rule-based, Gestalt model of cognition, such as Irène Deliège's cue abstraction model, describes how listener attention is drawn to prominent features which must be stored efficiently as cues; and how as a piece progresses, the recall and comparison of cues can lead to grouping and structuring of the mental schema which represents a piece.³⁹⁴ In either case, listening is the real-time navigation of a stream of musical information, and the processes used to make sense of it. Findings frequently point to the importance of local over macro features; such as how listeners segment a work according to surface similarity (contrast, discontinuity, change, and repetition) as opposed to syntax.³⁹⁵ This suggests that structural perception depends on surface features, and that listening entangles the macro and local aspects of a work in a manner far-removed from conventional music theory.

If music theory handles the score domain, musicology handles the social domain, and psychology handles the cognitive domain; then the digital domain is neither more remote nor less

³⁹³ Meyer, "Meaning in Music and Information Theory."

³⁹⁴ Deliège, "Similarity Perception."

³⁹⁵ Addressi and Caterina, "Perceptual Musical Analysis," 45-46.

significant to analysis than its elder kin. In all cases, the complicated correspondence between domains should not factor into the perceived significance of any individual domain. The need to validate digital findings through human experience—which is fundamentally no different than the validation of music theory by cognitive models—can be seen as a feeble humanistic attempt to maintain centrality in the pursuit of understanding. There is no horizon to the shapeless sea of endless meaning, and no center to its transient tides; and so, the perceived displacement of humanism is but a byproduct of the delusion that the formless ever had form, and that at its center was humanity. The digital domain can thus be taken, just as the other domains, as self-validating within itself, and readily conducive to comparative analysis.

Concerning the results of the present study, the graph of computed key strength is strongly supportive of Platoff and Webster's notions of tonal segments. Throughout all three operas, segments of near-key tonal motion which are separated by distant motion can be observed. These segments exist roughly at the mid-level, which is to say that they link multiple numbers and intervening recitatives with clearly defined shapes—such as ascending, descending, arch, and so on. A full account of each specific segment, and the dramatic segments it may relate to, could easily suggest future research; however, this would somewhat oppose the spirit of the present study, which offers feature extraction as a novel domain for comparative analysis. Especially given the macro scope of analyzing three operas in their entirety, the use of computational analysis to produce this domain is especially helpful.

By standardizing results across 26 extracted features, which were also dimensionally reduced to be measures of each audio track, each feature could be appropriately compared against the others. Of these features, Beat Sum in particular—and to a lesser extent, the 0th order of Method of Moments—exhibited prominent peaks near the ends of finales. As these two

features are aggregate measures of rhythm and dynamic, and somewhat indicative of the clarity and prevalence thereof; it can be concluded that the emphatic nature of the finale texture, with its tutti instrumentation, driving rhythms, and strong accents, is a likely contributor to these peaks. In fact, the various peaks which can be found removed from finales, though relatively few in number, all occur in situations of ensemble writing or chorus, where metrical clarity rises to the fore. Taking these feature extraction peaks and comparing them to segments in the other domains, and especially that of tonality, is in many respects the culmination of the present research. The result of doing so is remarkable in the sense that nearly every peak is accompanied by the start of a new segment in either tonality or waveform. This suggests that these peaks act as structural articulations across disparate domains—especially given that tonality is a pitch-based hierarchy completely dissimilar to the rhythmic and dynamic measures of Beat Sum and Method of Moments, respectively.

Future research which may continue in the same vein as the present could explore whether these feature extraction peaks—as well as the segments of tonality and waveform—exist across Mozart’s entire operatic oeuvre. Further study into other classical opera composers could also provide a comparative lens to the results here, and yet more study could even explore other eras and genres altogether. This plethora of options is emblematic of how feature extraction for use in music analysis is largely uncharted; Tuomas Eerola’s analysis of Schubert’s *Erlkönig* is a notable exception which provided groundwork for the present methodology,³⁹⁶ but the bulk of the theory community seems to be unaware of the very existence of feature extraction, and all that it may provide.

³⁹⁶ Eerola, “Analysing Emotions in Schubert’s *Erlkönig*.”

As to the question of musical translation which has brought about the present study, and the investigation of meaning it suggests, the answer now seems more innumerable than at the start. Through multivalent analysis, the Mozart-Da Ponte operas have continuously demonstrated a striking fluidity dependent upon analytic perspective; and thus, any notion of fixed meaning has been unmoored. And though the vicissitudes of meaning preclude any firm translation, they paradoxically ensure its unceasing existence with each subsequent reading. Finding meaning is like navigating an impossibly choppy sea of unreality. Not only is it transient, but it is also not literally located. As in semiotics, it emerges referentially between parties, and shifts with each of them: the symbol, the thing which is referenced, and the beholder to which the reference is known. Meaning exists on so many dimensions as to be outside our own reality, or on a different plane. We are but children in a bedsheet tent; meaning casts shadows on the sheets enshrouding our world—shadows which we mistake for sources. No more can we know meaning, than can we guess at the nameless actors who dance in the light of sightless suns beyond that veil. Meaning, or at least true meaning, is beyond us.

BIBLIOGRAPHY

- Addessi, Anna Rita, and Roberto Caterina. "Perceptual Musical Analysis: Segmentation and Perception of Tension." *Musicae Scientiae* 4, No. 1 (Spring 2000): 31-54.
- Agawu, V. Kofi. *Playing with Signs: A Semiotic Interpretation of Classic Music*. Princeton, NJ: Princeton University Press, 1991.
- Bowling, Daniel Liu. "The Biological Basis of Emotion in Musical Tonality." PhD diss., Duke University, 2012.
- Cannam, Chris, Christian Landone, and Mark Sandler. "Sonic Visualiser: An Open Source Application for Viewing, Analysing, and Annotating Music Audio Files." In *Proceedings of the 18th ACM International Conference on Multimedia*, 1467-1468. New York: Association for Computing Machinery, 2010.
- Carter, Tim. "Two into Three Won't Go? Poetic Structure and Musical Forms in Mozart's 'Idomeneo'." *Cambridge Opera Journal* 24, no. 3 (November 2012): 229-248.
- Clarke, Eric F., and Carol L. Krumhansl. "Perceiving Musical Time." *Music Perception: An Interdisciplinary Journal* 7, No. 3. (Spring 1990): 213-251.
- Cooper, Sean David. "The Virtue of Recitativo Semplice in the Operas of Wolfgang Amadeus Mozart." DMA diss., The University of Memphis, 2009.
- Cutler, Timothy Spence. "Orchestration and the Analysis of Tonal Music: Interaction Between Orchestration and Other Musical Parameters in Selected Symphonic Compositions, c.1785–1835." PhD diss., Yale University, 2000.
- Deliège, Irène. "Cue Abstraction as a Component of Categorisation Processes in Music Listening." *Psychology of Music* 24 (1996): 131-156.
- Deliège, Irène. "Similarity Perception ↔ Categorization ↔ Cue Abstraction." *Music Perception: An Interdisciplinary Journal* 18, No. 3 (Spring 2001): 233-243.
- Eerola, Tuomas. "Analysing Emotions in Schubert's *Erlkönig*: A Computational Approach." *Music Analysis* 29, no. 1/3 (March-October 2010): 214-233.
- Eerola, Tuomas, and Jonna K. Vuoskoski. "A Review of Music and Emotion Studies: Approaches, Emotion Models, and Stimuli." *Music Perception: An Interdisciplinary Journal* 30, no. 3 (February 1, 2013): 307–40.
- Garafallo, Daemon. "Mozart's 'Die Zauberflöte': A Kingdom of Notes and Numbers." Master's thesis, Florida Atlantic University, 2016.

- Green, Edward. "Tonal Symmetry in Leonore: An Instance of an Enduring Principle in Beethoven's Compositional Method." *International Review of the Aesthetics and Sociology of Music* 46, no. 2 (December 2015): 291-320.
- Halpin, Peter William. "The Wind Band in Mozart's Opera Orchestra: Origins, Function, and Legacy." DMA diss., University of Connecticut, 2007.
- Hansen, Niels Chr. "The Legacy of Lerdahl and Jackendoff's 'A Generative Theory of Tonal Music': Bridging a Significant Event in the History of Music Theory and Recent Developments in Cognitive Music Research." *Danish Yearbook of Musicology* 38 (2010-2011): 33-55.
- Harwood, Craig Eric. "Subversive Strategies: Conventions and Manipulation of Gesture and Syntax in Mozart." PhD diss., Yale University, 2002.
- Horn, Walter. "Tonality, Musical Form, and Aesthetic Value." *Perspectives of New Music* 53, no. 2 (Summer 2015): 201-235.
- Hunter, Mary. *Mozart's Operas: A Companion*. New Haven, CT: Yale University Press, 2008.
- Juslin, Patrik N. "Emotional Communication in Music Performance: A Functionalist Perspective and Some Data." *Music Perception: An Interdisciplinary Journal* 14, no. 4 (Summer 1997): 383-418.
- Korevaar, David. "Exoticism Assimilated: 'Turkish' Elements in Mozart's Sonata, K. 331 and Beethoven's 'Waldstein' Sonata, op. 53." *Journal of Musicological Research* 21, no. 3 (July-September 2002): 197-232.
- Korsakova-Kreyn, Marina. "Affective Response to Tonal Modulation." PhD diss., The University of Texas at Dallas, 2009.
- Lerch, Alexander. *An Introduction to Audio Content Analysis: Applications in Signal Processing and Music Informatics*. Hoboken, NJ: Wiley, 2012.
- Lerdahl, Fred, and Ray Jackendoff. *A Generative Theory of Tonal Music*. Cambridge, MA: MIT Press, 1983.
- Lü, Pi-Ling. "The Soubrette Roles in the Mozart - Da Ponte Operas." DMA diss., Boston University, 2002.
- Martin, Robert L. "Musical 'Topics' and Expression in Music." *Journal of Aesthetics and Art Criticism* 53, no. 4 (Autumn 1995): 417-424.
- Mauny, Marc de. "A Musical Commune." In liner notes for *Mozart: Le nozze di Figaro*. MusicAeterna, Teodor Currentzis, conductor. Recorded September 24 – October 4, 2012. Sony Classical 88843014162, 2014. CD. 27-30.

- McKay, Cory. "Automatic Music Classification with jMIR." PhD diss., McGill University, 2010.
- Meyer, Leonard B. "Meaning in Music and Information Theory." *The Journal of Aesthetics and Art Criticism* 15, no. 4 (June 1957): 412-424.
- Mozart, Wolfgang Amadeus. *Così fan tutte*. Neue Mozart-Ausgabe [New Mozart Edition]. Series II, Theatrical Works; Work Group 5, Operas and Singspiels; Vol. 18, edited by Faye Ferguson and Wolfgang Rehm. New York: Bärenreiter, 1991.
- Mozart, Wolfgang Amadeus. *Don Giovanni*. Neue Mozart-Ausgabe [New Mozart Edition]. Series II, Theatrical Works; Work Group 5, Operas and Singspiels; Vol. 17, edited by Wolfgang Plath and Wolfgang Rehm. New York: Bärenreiter, 1968.
- Mozart, Wolfgang Amadeus. *Le nozze di Figaro*. Neue Mozart-Ausgabe [New Mozart Edition]. Series II, Theatrical Works; Work Group 5, Operas and Singspiels; Vol. 16, edited by Ludwig Finscher. New York: Bärenreiter, 1973.
- Mozart, Wolfgang Amadeus. *The Letters of Wolfgang Amadeus Mozart: 1769—1791*. Translated by Lady Grace Wallace. 2 vols. New York: Hurd and Houghton, 1866.
- Mueller, Martin. "Escape from D-minor: Mozart's Encounter with Ancient Tragedy in 'Idomeneo'." *Arion: A Journal of Humanities and the Classics* 18, no. 1 (Spring/Summer 2010): 27-54.
- MusicAeterna. *Mozart: Così fan tutte*. Conducted by Teodor Currentzis. With the Orchestra and Chorus of the Perm Opera and Ballet Theatre. Recorded January 9 – 19, 2013. Sony Classical 88843095832, 2014. 3 CDs.
- MusicAeterna. *Mozart: Don Giovanni*. Conducted by Teodor Currentzis. With the Orchestra and Chorus of the Perm Opera and Ballet Theatre. Recorded November 23 – December 7, 2015. Sony Classical 88985316042, 2016. 3 CDs.
- MusicAeterna. *Mozart: Le nozze di Figaro*. Conducted by Teodor Currentzis. With the Orchestra and Chorus of the Perm Opera and Ballet Theatre. Recorded September 24 – October 4, 2012. Sony Classical 88843014162, 2014. 3 CDs.
- Pesic, Peter. "The Child and the Daemon: Mozart and Deep Play." *19th-Century Music* 25, no. 2-3 (Fall/Spring 2001-2002): 91-107.
- Platoff, John. "How Original Was Mozart? Evidence from 'Opera Buffa'." *Early Music* 20, no. 1 (February 1992): 105-117.
- Platoff, John. "Myths and Realities about Tonal Planning in Mozart's Operas." *Cambridge Opera Journal* 8, no. 1 (March 1996): 3-15.

- Platoff, John. "Tonal Organization in 'Buffo' Finales and the Act II Finale of 'Le Nozze di Figaro'." *Music and Letters* 72, no. 3 (August 1991): 387-403.
- Ponte, Lorenzo Da. *Così fan tutte*. Translated by Albert Windolph. In liner notes for *Mozart: Così fan tutte*. MusicAeterna, Teodor Currentzis, conductor. Recorded January 9 – 19, 2013. Sony Classical 88843095832, 2014. CD. 66-279.
- Ponte, Lorenzo Da. *Don Giovanni*. Translated by Avril Bardoni. In liner notes for *Mozart: Don Giovanni*. MusicAeterna, Teodor Currentzis, conductor. Recorded November 23 – December 7, 2015. Sony Classical 88985316042, 2016. CD. 62-273.
- Ponte, Lorenzo Da. *Le nozze di Figaro*. Translated by [Anonymous]. In liner notes for *Mozart: Le nozze di Figaro*. MusicAeterna, Teodor Currentzis, conductor. Recorded September 24 – October 4, 2012. Sony Classical 88843014162, 2014. CD. 72-339.
- Ratner, Leonard G. *Classic Music: Expression, Form, and Style*. New York: Schirmer Books, 1980.
- Roberts, Jeremy Ryan Briggs. "The Influence of Wolfgang Amadeus Mozart on the Creative Life and Output of Ludwig van Beethoven: A Cross-Genre Investigation." DMA diss., University of Washington, 2004.
- Rosen, Charles. *The Classical Style: Haydn, Mozart, Beethoven*. New York: W.W. Norton, 1972.
- Rosen, Charles. "Dramatic and Tonal Logic in Mozart's Operas." In *Freedom and the Arts*, 51-63. Cambridge, MA: Harvard University Press, 2012.
- Rozsa, Balazs. "The Formal World of Viennese Classicism." DMA diss., University of Washington, 2006.
- Rushton, Julian. "Buffo Roles in Mozart's Vienna: Tessitura and Tonality as Signs of Characterization." In *Opera Buffa of Mozart's Vienna*, edited by Mary Hunter and James Webster, 406-425. Cambridge, UK: Cambridge University Press, 1997.
- Schachter, Carl. "The Adventures of an F#: Tonal Narration and Exhortation in Donna Anna's First-Act Recitative and Aria." *Theory and Practice* 16 (1991): 5-20.
- Schroeder, David. *Mozart in Revolt: Strategies of Resistance, Mischief and Deception*. New Haven, CT: Yale University Press, 1999.
- Smith, Nicholas A., and Mark A. Schmuckler. "The Perception of Tonal Structure Through the Differentiation and Organization of Pitches." *Journal of Experimental Psychology: Human Perception and Performance* 30, no. 2 (April 2004): 268-286.
- Steblin, Rita. "Key Characteristics in the Eighteenth and Early Nineteenth Centuries: A Historical Approach." PhD diss., The University of Illinois at Urbana-Champaign, 1981.

- Sullo, Gregory B. "The Structuring of Musical Perception." Master's thesis, Illinois State University, 2017.
- Svensson, Patrik. *Big Digital Humanities: Imagining a Meeting Place for the Humanities and the Digital*. Ann Arbor: University of Michigan Press, 2016.
- Taruskin, Richard. "The Poietic Fallacy." *The Musical Times* 145, no. 1886 (Spring 2004): 7-34.
- Tenney, James. *Meta+Hodos: A Phenomenology of 20th-Century Musical Materials and an Approach to the Study of Form and Meta Meta+Hodos*. 2nd ed. Oakland, CA: Frog Peak Music, 1988.
- Tenney, James, and Larry Polansky. "Temporal Gestalt Perception in Music." *Journal of Music Theory* 24, no. 2 (Autumn 1980): 205-241.
- Tovey, Donald Francis. *Essays in Musical Analysis*. 6 vols. New York: Oxford University Press, 1935-39.
- Vallieres, Michel. "Beginnings, Middles, and Ends: Perception of Intrinsic Formal Functionality in the Piano Sonatas of W. A. Mozart." PhD diss., McGill University, 2012.
- Waldoff, Jessica Pauline. "The Music of Recognition in Mozart's Operas." PhD diss., Cornell University, 1995.
- Webster, James. "The Act IV Finale of *Le nozze di Figaro*: Dramatic and Musical Construction." In *Dramma Giocoso: Four Contemporary Perspectives on the Mozart/Da Ponte Operas*, 91-129. Leuven, Belgium: Leuven University Press, 2012.
- Webster, James. "Mozart's Operas and the Myth of Musical Unity." *Cambridge Opera Journal* 2, no. 2 (July 1990): 197-218.
- Webster, James. "Understanding Opera Buffa: Analysis = Interpretation." In *Opera Buffa of Mozart's Vienna*, edited by Mary Hunter and James Webster, 340-377. Cambridge, UK: Cambridge University Press, 1997.
- Zeiss, Laurel Elizabeth. "Permeable Boundaries in Mozart's 'Don Giovanni.'" *Cambridge Opera Journal* 13, no. 2 (July 2001): 115-139.

APPENDIX A: Audio Track Listing

Table A.1.

Le nozze di Figaro - MusicaAeterna Audio Track Listing					
Duration	Title	Timestamp	Act: Number	Key	Type: Characters
3:59	Sinfonia	0:00	1	D	-
2:48	Cinque... dieci... venti...	3:59	1.01	G	No. 1, Duettino: Susanna, Figaro
0:45	Cosa stai misurando	6:47	-	B	Recitativo: Susanna, Figaro
2:42	Se a caso madama la notte ti chiama	7:32	1.02	Bb	No. 2, Duettino: Susanna, Figaro
1:50	Or bene, ascolta, e taci!	10:14	-	-	Recitativo: Susanna, Figaro
0:50	Bravo signor padrone!	12:04	-	-	Recitativo: Figaro
2:40	Se vuoi ballare signor Contino	12:54	1.03	F	No. 3, Cavatina: Figaro
1:09	Ed aspettaste il giorno fissato a le sue nozze	15:34	-	-	Recitativo: Bartolo, Marcellina
3:06	La vendetta, oh la vendetta	16:43	1.04	D	No. 4, Aria: Bartolo
0:43	Tutto ancor non ho perso	19:49	-	-	Recitativo: Marcellina, Susanna
2:14	Via, resti servita, madama brillante	20:32	1.05	A	No. 5, Duettino: Susanna, Marcellina
2:05	Va' là, vecchia pedante	22:46	-	-	Recitativo: Susanna, Cherubino
2:43	Non so più cosa son, cosa faccio	24:51	1.06	Eb	No. 6, Aria: Cherubino
1:50	Ah son perduto!	27:34	-	-	Recitativo: Cherubino, Susanna, Il Conte, Basilio
2:10	Susanna, il diel vi salvi	29:24	-	-	Recitativo: Basilio, Susanna, Il Conte
4:10	Cosa sentol tosto andate	31:34	1.07	Bb	No. 7, Terzetto: Susanna, Basilio, Il Conte
0:58	Basilio, in traccia tosto di Figaro volate	35:44	-	-	Recitativo: Il Conte, Susanna, Cherubino, Basilio
1:13	Giovani liete fiori spargete	36:42	1.08	G	No. 8, Coro
1:27	Cos'è questa commedia?	37:55	-	-	Recitativo: Il Conte, Figaro, Susanna
0:57	Giovani liete fiori spargete	39:22	1.09	G	No. 9, Coro
1:11	Evviva!	40:19	-	-	Recitativo: Figaro, Susanna, Basilio, Cherubino, Il Conte
4:09	Non più andrai farfallone amoroso	41:30	1.10	C	No. 10, Aria: Figaro
3:21	Porgi amor qualche ristoro	45:39	2.11	Eb	No. 11, Cavatina: La Contessa
3:51	Vieni, cara Susanna	49:00	-	-	Recitativo: La Contessa, Susanna, Figaro
1:28	Quanto duolmi, Susanna	52:51	-	-	Recitativo: La Contessa, Susanna, Cherubino
2:58	Voi che sapete che cosa è amor	54:19	2.12	Bb	No. 12, Arietta: Cherubino
1:08	Bravoi che bella voce!	57:17	-	-	Recitativo: La Contessa, Susanna, Cherubino
2:31	Venite, ingimochiatevi	58:25	2.13	G	No. 13, Aria: Susanna
2:53	Quante buffonerie!	1:00:56	-	-	Recitativo: La Contessa, Susanna, Cherubino [Il Conte]
1:19	Che novità	1:03:49	-	-	Recitativo: Il Conte, La Contessa
3:25	Susanna or via sortite	1:05:08	2.14	C	No. 14, Terzetto: Susanna, La Contessa, Il Conte
0:53	Dunque voi non aprite?	1:08:33	-	-	Recitativo: Il Conte, La Contessa
0:55	Aprite presto aprite	1:09:26	2.15	G	No. 15, Duettino: Susanna, Cherubino
0:23	Oh guarda il demonietto!	1:10:21	-	-	Recitativo: Susanna
1:18	Tutto è come il lascial	1:10:44	-	-	Recitativo: Il Conte, La Contessa
2:35	Esci omai garzon malnato	1:12:02	2.16	Eb	No. 16, Finale: Il Conte, La Contessa
1:29	Signore, cos'è quel stupore?	1:14:37	-	-	Molto andante: Susanna, Il Conte, La Contessa
2:58	Susanna, son morta: il fiato mi manca	1:16:06	-	-	Allegro: La Contessa, Susanna, Il Conte
1:03	Signori, di fuori son già i suonatori	1:19:04	-	-	Allegro: Figaro, Il Conte, La Contessa, Susanna
2:15	Conoscete, signor Figaro	1:20:07	-	-	Andante: Il Conte, Figaro, La Contessa, Susanna
5:39	Ah signor... signor... Cosa è stato... Vostre dunque saran... Vostre dunque saran	1:22:22	-	-	Allegro molto: Antonio, Il Conte, La Contessa, Susanna, Figaro
1:24:57				Bb	
3:49	Voi signor, che giusto siete... Son confusa, son stordita	1:28:01	-	-	Allegro assai: Marcellina, Basilio, Bartolo, Il Conte, La Contessa, Figaro, Susanna

Table A.1. (cont.)

1:05	Che imbarazzo è mai questo!	1:31:50	3	-	Recitativo: Il Conte
1:40	Via fatti core	1:32:55		-	Recitativo: La Contessa, Il Conte, Susanna
2:55	Crudeli! perchè finora Mi sento dal contento	1:34:35 1:35:44	3:17	Am	No. 17, Duettino: Susanna, Il Conte
1:00	E perchè fosti meco	1:37:30		-	Recitativo: Il Conte, Susanna, Figaro
1:18	Hai già vinta la causai	1:38:30	3:18	-	No. 18, Recitativo: Il Conte
3:26	Vedrò mentre io sospiro	1:39:48		D	No. 18, Aria: Il Conte
2:19	È decisa la lite	1:43:14		-	Recitativo: Don Curzio, Marcellina, Figaro, Il Conte, Bartolo
5:43	Riconosci in questo amplesso	1:45:33	3:19	F	No. 19, Sestetto: Susanna, Marcellina, Don Curzio, Il Conte, Bartolo, Figaro
1:16	Eccovi, oh caro amico	1:51:16		-	Recitativo: Marcellina, Bartolo, Susanna, Figaro
0:44	Andiam, andiam, bel paggio	1:52:32		-	Recitativo: Barbarina, Cherubino
1:48	E Susanna non vieni!	1:53:16	3:20	-	No. 20, Recitativo: La Contessa
4:41	Dove sono i bei momenti	1:55:04		C	No. 20, Aria: La Contessa
0:36	Io vi dico signor	1:59:45		-	Recitativo: Antonio, Il Conte
0:25	Cosa mi narri	2:00:21		-	Recitativo: La Contessa, Susanna
3:01	Sull'aria... Che soave zeffiretto	2:00:46	3:21	Bb	No. 21, Duettino: Susanna, La Contessa
0:30	Pregato è il foglio	2:03:47		-	Recitativo: Susanna, La Contessa
1:12	Ricevete, oh padroncina	2:04:17	3:22	G	No. 22, Coro
3:12	Queste sono, madama	2:05:29		-	Recitativo: Barbarina, La Contessa, Susanna, Antonio, Il Conte, Cherubino, Figaro
2:03	Ecco la marcia, andiamo	2:08:41	3:23	C	No. 23, Finale: Susanna, La Contessa, Il Conte, Figaro
1:08	Amaniti costanti	2:10:44		C	Allegretto: Coro
1:45	Eh già, solita usanza	2:11:52		Am	Andante: Il Conte, Figaro
1:14	Andate amici!... Amaniti costanti	2:13:37		C	Il Conte, Coro
2:14	L'ho perduta ... me meschina	2:14:51	4:24	Fm	No. 24, Cavatina: Barbarina
2:02	Barbarina, cos'hai	2:17:05		-	Recitativo: Figaro, Barbarina, Marcellina
0:34	Presto avvertiam Susanna	2:19:07		-	Recitativo: Marcellina
3:32	Il capro e la capretta	2:19:41	4:25	G	No. 25, Aria: Marcellina
2:01	Nel padiglione a manca	2:23:13		-	Recitativo: Barbarina, Figaro, Basilio, Bartolo
3:50	In quegli' anni, in cui val poco	2:25:14	4:26	Bb	No. 26, Aria: Basilio
1:15	Tutto è disposto	2:29:04	4:27	-	No. 27, Recitativo: Figaro
2:42	Aprite un po' quegli'occhi	2:30:19		Eb	No. 27, Aria: Figaro
0:50	Signora, ella mi disse	2:33:01		-	Recitativo: Susanna, Marcellina, La Contessa, Figaro
1:22	Giunse alfin il momento	2:33:51	4:28	-	No. 28, Recitativo: Susanna
3:11	Deh vieni, non tardar	2:35:13		F	No. 28, Aria: Susanna
0:45	Perfida, e in quella forma meco mentia?	2:38:24		-	Recitativo: Figaro, Cherubino, La Contessa
3:23	Pian pianin le andrò più presso	2:39:09	4:29	D	No. 29, Finale: Susanna, La Contessa, Cherubino, Il Conte, Figaro
2:16	Partito e alfin l'audace	2:42:32		G	Con un poco piu di moto: Susanna, La Contessa, Il Conte, Figaro
4:14	Tutto è tranquillo e placido	2:44:48		Eb	Larghetto: Figaro, Susanna
1:51	Pace, pace, mio dolce tesoro	2:49:02		Bb	Andante: Figaro, Susanna, Il Conte
1:29	Gente, gente, all'armi, all'armi	2:50:53		G	Allegro assai: Il Conte, Figaro, Basilio, Antonio, Susanna, Barbarina, Cherubino, Marcellina, La Contessa
2:48	Contessa perdono	2:52:22		G	Andante: Il Conte, La Contessa, Susanna, Barbarina, Cherubino, Marcellina, Basilio, Antonio, Figaro
1:19	Questo giorno di tormenti	2:55:10		D	Allegro assai: Susanna, La Contessa, Barbarina, Cherubino, Marcellina, Basilio, Il Conte, Antonio, Figaro

Table A.2.

Duration		Title		Timestamp		Act.Number		Key		Type: Characters	
5:13	Ouverture	0:00	1:22	1	Dm	-					
1:31	Noite e giorno fatcar	5:13	5:13	1.01	F	No. 1, Introduzione: Leporello					
2:00	Non sperar, se non m'uccidi	6:44	6:44		F	No. 1, Introduzione: Donna Anna, Don Giovanni, Leporello, Il Commendatore					
1:29	Ah...soccorso	8:44	8:44		F	No. 1, Introduzione: Il Commendatore, Don Giovanni, Leporello					
0:41	Leporello, ove seir?	10:13	10:13		-	Recitativo: Don Giovanni, Leporello					
3:01	Ah del padre in periglio... Ma qual mai s'offre, o Dei	10:54	10:54	1.02	-	Recitativo, No. 2 Recitativo accompagnato e Duetto: Donna Anna, Don Ottavio					
3:28	Fuggi, crudele, fuggii!	13:55	13:55		Dm	Duetto: Donna Anna, Don Ottavio					
1:52	Orsù, spicciati presto	17:23	17:23		-	Recitativo: Don Giovanni, Leporello					
3:32	Ah chi mi dice mai	19:15	19:15	1.03	Eb	No. 3, Aria: Donna Elvira, Don Giovanni, Leporello					
3:02	Chi è là?	22:47	22:47		-	Recitativo: Donna Elvira, Don Giovanni, Leporello					
5:24	Madamina, il catalogo è questo	25:49	25:49	1.04	D	No. 4, Aria: Leporello					
0:51	In questa forma dunque	31:13	31:13		G	Recitativo: Donna Elvira					
1:19	Giovinette che fate all'amore	32:04	32:04	1.05	-	No. 5, Coro: Zerlina, Masetto, Coro di contadini					
2:33	Manco male è partita	33:23	33:23		-	Recitativo: Don Giovanni, Leporello, Zerlina, Masetto					
1:26	Ho capito, signor si	35:56	35:56	1.06	F	No. 6, Aria: Masetto					
2:38	Affin siam liberati	37:22	37:22		-	Recitativo: Don Giovanni, Zerlina					
3:23	Là ci darem la mano	40:00	40:00	1.07	A	No. 7, Duetto: Don Giovanni, Zerlina					
0:46	Fermati scellerato	43:23	43:23		-	Recitativo: Donna Elvira, Zerlina, Don Giovanni					
1:08	Ah fuggi il traditor	44:09	44:09	1.08	D	No. 8, Aria: Donna Elvira					
1:24	Mi par ch'oggi il demonio si diverta... Ah ti ritrovo anc	45:17	45:17		B	Recitativo: Don Giovanni, Don Ottavio, Donna Anna, Recitativo: Donna Elvira					
3:54	Non ti fidar, o misera	46:41	46:41	1.09	Bb	No. 9, Quartetto: Donna Elvira, Donna Anna, Don Ottavio, Don Giovanni					
0:21	Povera sventurata!	50:35	50:35		-	Recitativo: Don Giovanni					
3:10	Don Ottavio, son mortal	50:56	50:56	1.10	-	No. 10, Recitativo accompagnato: Donna Anna, Don Ottavio					
2:32	Or sai chi l'onore	54:06	54:06		D	Aria: Donna Anna					
0:28	Come mai creder deggio	56:38	56:38		-	Recitativo: Don Ottavio					
4:10	Dalla sua pace	57:06	57:06		G	No. 10a, Aria: Don Ottavio					
1:43	lo deggio ad ogni patto	1:01:16	1:01:16		-	Recitativo: Leporello, Don Giovanni					
1:18	Fin ch'han dal vino	1:02:59	1:02:59	1.11	Bb	No. 11, Aria: Don Giovanni					
1:11	Masetto: senti un po'	1:04:17	1:04:17		-	Recitativo: Zerlina, Masetto					
3:15	Batti, batti, o bel Masetto	1:05:28	1:05:28	1.12	F	No. 12, Aria: Zerlina					
0:45	Guarda un po' come seppa	1:08:43	1:08:43		-	Recitativo: Masetto, Don Giovanni, Zerlina					
0:51	Presto presto pria ch'ei venga	1:09:28	1:09:28	1.13	C	No. 13, Finale: Allegro assai: Masetto, Zerlina					
0:42	Su svegliatevi, da bravi	1:10:19	1:10:19		C	Don Giovanni, Coro di Servi					
2:08	Tra quest'arbori celata	1:11:01	1:11:01		F	Andante: Zerlina, Don Giovanni, Masetto					
0:55	Bisogna aver coraggio	1:13:09	1:13:09		Dm	Donna Elvira, Don Ottavio, Donna Anna					
1:02	Signor, guardate un poco	1:14:04	1:14:04		F	Menuetto: Donna Elvira, Don Ottavio, Donna Anna, Leporello, Don Giovanni					
2:08	Protegga il giusto cielo	1:15:06	1:15:06		Bb	Adagio: Donna Anna, Don Ottavio, Donna Elvira					
1:16	Riposate, vezzose ragazze	1:17:14	1:17:14		Eb	Allegro: Don Giovanni, Leporello, Masetto, Zerlina					
3:50	Venite pur avanti, vezzose mascherette	1:18:30	1:18:30		C	Maestoso: Leporello, Don Giovanni, Donna Anna, Donna Elvira, Don Ottavio, Masetto, Zerlina					
	Da bravi, via ballate!	1:19:59	1:19:59		G						
	Soccorriamo l'innocente!	1:21:51	1:21:51		C						
1:15	Ecco il birbo che t'ha offesa	1:22:20	1:22:20		C	Andante maestoso: Leporello, Don Giovanni, Donna Anna, Donna Elvira, Don Ottavio, Masetto, Zerlina					
2:01	Trema, tremi, o scellerati!	1:23:35	1:23:35		C	Allegro: Don Giovanni, Leporello, Don Ottavio, Donna Anna, Donna Elvira					

Table A.2. (cont.)

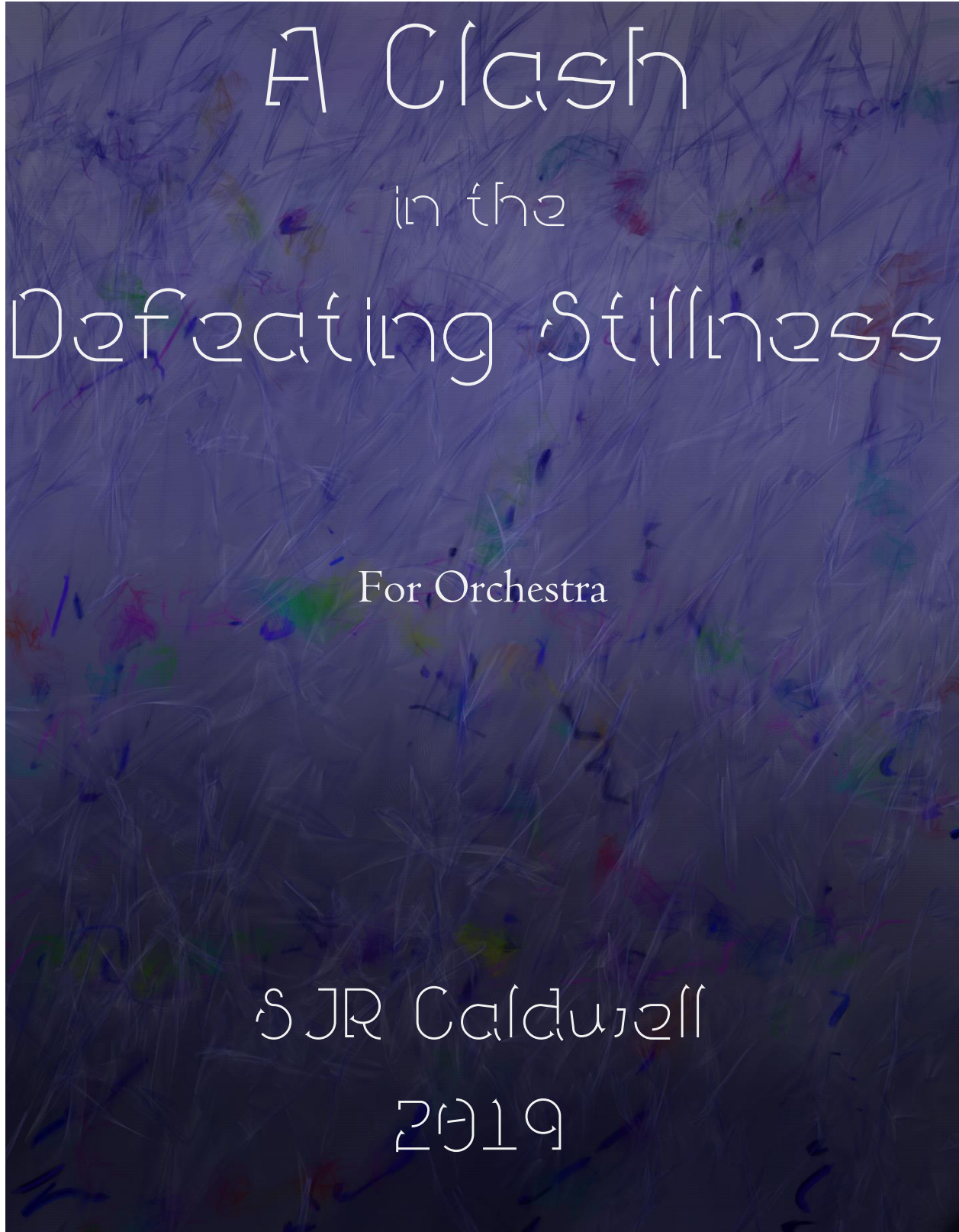
0:58	Eh via burfone	1:25:36	2.14	G	No. 14, Duetto: Don Giovanni, Leporello
2:33	Leporello, Signore. Vien qui	1:26:34		-	Recitativo: Don Giovanni, Leporello
4:42	Ah taci, ingiusto core	1:29:07	2.15	A	No. 15, Terzetto: Donna Elvira, Leporello, Don Giovanni
0:38	Amico, che ti par'?	1:33:49		-	Recitativo: Don Giovanni, Leporello
2:00	Eccomi a voi!	1:34:27		-	Recitativo: Donna Elvira, Don Giovanni, Leporello
1:53	Deh vieni alla finestra	1:36:27	2.16	D	No. 16, Canzonetta: Don Giovanni
0:09	V'e gente alla finestra!	1:38:20		-	Recitativo: Don Giovanni
1:04	Non ci stanchiamo	1:38:29		-	Recitativo: Masetto, Don Giovanni
2:31	Metà di voi qua vadano	1:39:33	2.17	F	No. 17, Aria: Don Giovanni
0:57	Zitto! lascia ch'io senta	1:42:04		-	Recitativo: Don Giovanni, Masetto
1:12	Ahi ah! la testa mia!	1:43:01		-	Recitativo: Masetto, Zerlina
2:57	Vedrai, carino	1:44:13	2.18	C	No. 18, Aria: Zerlina
0:36	Di molte faci il lume	1:47:10		-	Recitativo: Leporello, Donna Elvira
4:46	Sola sola in buio loco... Fermi, briccone	1:47:46	2.19	Eb	No. 19, Sestetto: Donna Elvira, Leporello, Don Ottavio, Donna Anna, Zerlina, Masetto
	Tergi il ciglio	1:48:47		D	
	Solla morte	1:49:32		Cm	
2:16	Mille torbidi pensieri	1:52:32		Eb	Molto Allegro: Donna Elvira, Leporello, Don Ottavio, Donna Anna, Zerlina, Masetto
0:26	Dunque quello sei tu	1:54:48		-	Recitativo: Zerlina, Donna Elvira, Don Ottavio, Masetto
1:35	Ah pietà, signori miei	1:55:14	2.20	G	No. 20, Aria: Leporello
0:41	Ferma, perfido, ferma	1:56:49		-	Recitativo: Donna Elvira, Masetto, Zerlina, Don Ottavio
3:51	Il mio tesoro intanto	1:57:30	2.21	Bb	No. 21, Aria: Don Ottavio
1:42	Restati qual	2:01:21		-	Recitativo: Zerlina, Leporello
3:07	Per queste tue manine	2:03:03		C	No. 21a, Duetto: Leporello, Zerlina
1:03	Amico, per pietà	2:06:10		-	Recitativo: Leporello
2:44	In quali eccessi, o Numi	2:07:13		-	No. 21b, Recitativo accompagnato: Donna Elvira
3:58	Mi tradi quell'alma ingrata	2:09:57		Eb	Aria: Donna Elvira
5:10	Ah ah ah ah, questa è buona	2:13:55		-	Recitativo: Don Giovanni, Leporello, Il Commendatore
3:39	O statua gentilissima	2:19:05	2.22	E	No. 22, Duetto: Leporello, Don Giovanni
0:48	Calnatevi, idol mio	2:22:44		-	Recitativo: Don Ottavio, Donna Anna
1:37	Crudele! Ah no, mio bene!	2:23:32	2.23	F	Rondo: Donna Anna
4:25	Non mi dir, bell'idol mio	2:25:09		-	Recitativo: Don Ottavio
0:21	Ah, si segua il suo passo	2:29:34		-	Recitativo: Don Ottavio
4:22	Già la mensa è preparata	2:29:55	2.24	D	No. 24, Finale: Allegro vivace: Don Giovanni, Leporello
	Evvivano i "litiganti"!	2:32:12		F	
	Questa poi la conosco	2:33:06		Bb	
2:28	L'ultima prova	2:34:17		Bb	Allegro assai: Donna Elvira, Don Giovanni, Leporello
0:49	Ah signor... per carità!	2:36:45		F	Molto Allegro: Leporello, Don Giovanni
5:01	Don Giovanni, a cenar teco	2:37:34		Dm	Andante: Il Commendatore, Don Giovanni, Leporello
1:06	Da qual tremore insolito	2:42:35		Dm	Allegro: Don Giovanni, Coro, Leporello
1:33	Ah dove è il perfido	2:43:41		G	Allegro assai: Donna Elvira, Zerlina, Don Ottavio, Masetto, Donna Anna, Leporello
3:11	Or che tutti, o mio tesoro... Resti dunque quel birbon	2:45:14		G	Larghetto: Don Ottavio, Donna Anna, Donna Elvira, Zerlina, Masetto, Leporello
1:46	Questo è il fin	2:48:25		D	Presto: Donna Anna, Donna Elvira, Don Ottavio, Masetto, Leporello, Zerlina

Table A.3.

Duration Title		Cosi fan tutte - Musidateterna Audio Track Listing			
Timestamp	Act: Number	Key	Type	Characters	
3:53	Ouverture	0:00	1	C	-
1:53	La mia Dorabella capace non è	3:53	1.01	G	No. 1, Terzetto: Ferrando, Don Alfonso, Guglielmo
1:03	Fuor la spada	5:46		-	Recitativo: Guglielmo, Don Alfonso, Ferrando
1:02	È la fede delle femmine	6:49	1.02	E	No. 2, Terzetto: Ferrando, Don Alfonso, Guglielmo
1:19	Sciocherie di poeti	7:51		-	Recitativo: Ferrando, Guglielmo, Don Alfonso
2:16	Una bella serenata	9:10	1.03	C	No. 3, Terzetto: Ferrando, Don Alfonso, Guglielmo
5:10	Ah guarda, sorella	11:26	1.04	A	No. 4, Duetto: Fiordiligi, Dorabella
1:16	Mi par che stamattina	16:36		-	Recitativo: Fiordiligi, Dorabella, Don Alfonso
0:45	Vorrei dir, e cor non ho	17:52	1.05	Fm	No. 5, Aria: Don Alfonso
1:05	Stelle! Per carità, signor Alfonso	18:37		-	Recitativo: Fiordiligi, Don Alfonso, Dorabella
4:10	Sento odio, che questo piede	19:42	1.06	Eb	No. 6, Quintetto: Fiordiligi, Dorabella, Ferrando, Guglielmo, Don Alfonso
0:55	Non piangere, idol mio	23:52		-	Recitativo: Guglielmo, Ferrando, Don Alfonso, Fiordiligi, Dorabella
1:25	Al fato dà legge	24:47	1.07	Bb	No. 7, Duettino: Ferrando, Guglielmo
0:44	La commedia è graziosa	26:12		-	Recitativo: Don Alfonso, Ferrando, Fiordiligi, Dorabella
1:25	Bella vita militari	26:56	1.08	D	No. 8, Coro
0:32	Non v'è più tempo, amici	28:21		-	Recitativo: Don Alfonso, Fiordiligi, Dorabella, Ferrando, Guglielmo
2:24	Di scrivermi ogni giorno	28:53		-	Recitativo: Fiordiligi, Dorabella, Ferrando, Guglielmo, Don Alfonso
0:45	Bella vita militari	31:17	1.09	D	No. 9, Coro
0:57	Dove son? Son partiti	32:02		-	Recitativo: Dorabella, Don Alfonso, Fiordiligi
3:27	Soave sia il vento	32:59	1.10	E	No. 10, Terzetto: Fiordiligi, Dorabella, Don Alfonso
1:01	Non son cattivo comico! – Nel mare solca	36:26		-	Recitativo: Don Alfonso
1:08	Che vita maledetta ... Madame, ecco la vostra colazione	37:27		-	Recitativo: Despina, Fiordiligi, Dorabella
1:05	Ah scostati	38:35		-	Recitativo: Dorabella
1:43	Smanie implacabili che m'agitare	39:40	1.11	Eb	No. 11, Aria: Dorabella
2:12	Signora Dorabella, signora Fiordiligi	41:23		-	Recitativo: Despina, Dorabella, Fiordiligi
2:34	In uomini! In soldati	43:35	1.12	F	No. 12, Aria: Despina
3:14	Che silenzi! Che aspetto di tristezza	46:09		-	Recitativo: Don Alfonso, Despina
4:18	Alla bella Despina	49:23	1.13	C	No. 13, Sestetto: Fiordiligi, Dorabella, Despina, Ferrando, Don Alfonso, Guglielmo
3:24	Che sussurro! Che strepito	53:41		-	Recitativo: Don Alfonso, Dorabella, Fiordiligi, Ferrando, Guglielmo, Despina
3:58	Come scoglio immoto resta	57:05	1.14	Bb	No. 14, Aria: Fiordiligi
1:03	Ah non partite	1:01:03		-	Recitativo: Ferrando, Guglielmo, Don Alfonso, Dorabella, Fiordiligi
1:45	Non siate ritrosi	1:02:06	1.15	G	No. 15, Aria: Guglielmo
0:46	E voi ridete?	1:03:51	1.16	G	No. 16, Terzetto: Ferrando, Guglielmo, Don Alfonso
1:03	Si può sapere un poco	1:04:37		-	Recitativo: Don Alfonso, Guglielmo, Ferrando
5:03	Un'aura amorosa	1:05:40	1.17	A	No. 17, Aria: Ferrando
2:21	Oh la sarta da ridere	1:10:43		-	Recitativo: Don Alfonso, Despina
2:53	Ah che tutta in un momento	1:13:04	1.18	D	No. 18, Finale: Fiordiligi, Dorabella
1:33	Si mora sì, si mora	1:15:57		G	Ferrando, Don Alfonso, Guglielmo, Fiordiligi, Dorabella
3:19	Giaché a morir vicini	1:17:30		Eb	Don Alfonso, Fiordiligi, Dorabella, Despina, Ferrando, Guglielmo
2:46	Eccovi il medico	1:20:49		G	Don Alfonso, Ferrando, Guglielmo, Despina, Fiordiligi, Dorabella
3:57	Dove son! Che loco è questo!	1:23:35		Bb	Don Alfonso, Ferrando, Guglielmo, Despina, Fiordiligi, Dorabella
3:05	Dammi un bacio, o mio tesoro	1:27:32		D	Don Alfonso, Ferrando, Guglielmo, Despina, Fiordiligi, Dorabella

Table A.3. (cont.)

3:16	Andate là, che siete	1:30:37	2	-	Recitativo: Despina, Fiordiligi, Dorabella
3:44	Una donna a quindici anni	1:33:53	2.19	G	No. 19, Aria: Despina
1:26	Sorella, cosa dici?	1:37:37		-	Recitativo: Fiordiligi, Dorabella
3:02	Prenderò quel brunettino	1:39:03	2.20	Bb	No. 20, Duetto: Fiordiligi, Dorabella
0:21	Ah correte al giardino	1:42:05		-	Recitativo: Don Alfonso, Dorabella
3:29	Secondate, aurette amiche	1:42:26	2.21	Eb	No. 21, Duetto con Coro: Ferrando, Guglielmo
0:47	Il tutto deponete	1:45:55		-	Recitativo: Don Alfonso, Fiordiligi, Dorabella, Despina, Ferrando, Guglielmo
2:16	La mano a me date	1:46:42	2.22	D	No. 22: Despina, Ferrando, Guglielmo, Don Alfonso
2:39	Oh che bella giornata!	1:48:58		-	Recitativo: Fiordiligi, Ferrando, Dorabella, Guglielmo
5:21	Il core vi dono	1:51:37	2.23	F	No. 23, Duetto: Dorabella, Guglielmo
1:37	Barbara! Perché fuggi?	1:56:58		-	Recitativo: Ferrando, Fiordiligi
1:31	Ei parte sentii! Ah no partir si lasci	1:58:35		-	Recitativo: Fiordiligi
7:48	Per pietà, ben mio, perdona	2:00:06	2.25	E	No. 25, Rondo: Fiordiligi
3:59	Amico, abbiamo vinto!	2:07:54		-	Recitativo: Ferrando, Guglielmo
3:01	Donne mie, la fate a tanti	2:11:53	2.26	G	No. 26, Aria: Guglielmo
1:26	In qual fiero contrasto	2:14:54		-	Recitativo: Ferrando
2:03	Tradito, schernito	2:16:20	2.27	Cm	No. 27, Cavatina: Ferrando
	Io sento che ancora	2:17:23		C	
1:29	Bravo: questa è costanza.	2:18:23		-	Recitativo: Don Alfonso, Ferrando, Guglielmo
2:26	Ora vedo che siete	2:19:52		-	Recitativo: Despina, Dorabella, Fiordiligi
3:07	È amore un ladroncello	2:22:18	2.28	Bb	No. 28, Aria: Dorabella
2:45	Come tutto con giura	2:25:25		-	Recitativo: Fiordiligi, Guglielmo, Despina, Don Alfonso
6:00	Fra gli amplessi in pochi istanti	2:28:10	2.29	A	No. 29, Duetto: Fiordiligi, Ferrando
	Son abbastanza	2:29:54		C	
	Volgi a me	2:31:13		A	
2:07	Ah poveretto mel Cosa ho veduto!	2:34:10		-	Recitativo: Guglielmo, Don Alfonso, Ferrando
1:01	Tutti accusan le donne	2:36:17	2.30	C	No. 30: Don Alfonso, Ferrando, Guglielmo
0:34	Vittoria, padroncini!	2:37:18		-	Recitativo: Despina, Ferrando, Don Alfonso, Guglielmo
1:20	Fate presto, o cari amici	2:37:52	2.31	C	No. 31, Finale: Despina, Coro, Don Alfonso
3:49	Benedetti i doppi coniugi	2:39:12		Eb	Coro, Fiordiligi, Dorabella, Ferrando, Guglielmo
2:06	E nel tuo, nel mio bicchiere	2:43:01		Eb	Fiordiligi, Ferrando, Dorabella, Guglielmo
1:29	Miei signori, tutto è fatto	2:45:07		E	Don Alfonso, Fiordiligi, Dorabella, Ferrando, Guglielmo, Despina
0:31	Bella vita militar!	2:46:36		D	Coro, Fiordiligi, Dorabella, Despina, Ferrando, Guglielmo, Don Alfonso
1:07	Misericordia! Numi del cielo!	2:47:07		Eb	Don Alfonso, Fiordiligi, Dorabella, Ferrando, Guglielmo, Despina
2:58	Sani e salvi agli amplessi amorosi	2:48:14		Bb	Ferrando, Guglielmo, Don Alfonso, Fiordiligi, Dorabella, Despina
4:47	Giusto ciel	2:51:12		Bb	Ferrando, Guglielmo, Don Alfonso, Fiordiligi, Dorabella, Despina
	Son stupefate	2:53:48		C	
1:38	Fortunato l'uom che prende	2:55:59		C	Ferrando, Guglielmo, Don Alfonso, Fiordiligi, Dorabella, Despina



A Clash
in the
Defeating Stillness

For Orchestra

SJR Caldwell

2019

A Clash in the Defeating Stillness

Instrumentation

I Piccolo

I Flute

I Oboe

I Cor Anglais

I Clarinet I

I Bass Clarinet

I Bassoon

I Contrabassoon

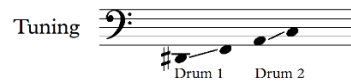
I Horn

I Trumpet

I Trombone

I Tuba

Timpani



Percussion

Snare Drum

Bass Drum

Suspended Cymbal

Wood Block

Crotales (upper octave) (with bow)

Violin I

Violin II

Viola

Violoncello

Contrabass

A Clash in the Defeating Stillness

Program Note

The world can be a hard place to navigate due to its many dichotomies. At once it is good and bad, clear and complex, just and unfair – like a tempest under sunny skies, it is not easy to understand. This music is a clear reflection through unsettled waters of such thoughts. Of perpetual battle and arresting peace, of softest night and searing day – the unimaginable range of life woven together is in simultaneity, and this music aims to capture a mere snapshot of these forces. The dynamic is captured and rendered motionless; an image of eternal bloom betrayed into cold stagnation. This piece partakes in a feast of contradiction, raises a glass to the crew of uncertainty, and sails headlong into the tempest. But the caged bird sings of peace and the imprisoned bloom looks on in stoic beauty – this is not a story of one, but many – and their tales will go on, unto the end.

Score in C

ca. 8'00"

Cover Painting by Stephen Caldwell

A Clash in the Defeating Stillness

SJR Caldwell
2019

12 **Hope and Fear**
♩ = 74

2 3 //

The score is for a full orchestra and includes the following parts:

- Piccolo:** Measures 2-3, dynamics *mp* to *mf*.
- Flute:** Measures 2-3, dynamics *mp* to *mf*.
- Oboe:** Measures 2-3, dynamics *mp* to *mf*.
- Clarinet in Bb:** Measures 2-3, dynamics *mp* to *mf*.
- Baritone Saxophone:** Measures 2-3, dynamic *mp*.
- Horn in F:** Measures 2-3, dynamic *mp*.
- Trumpet in Bb:** Measures 2-3, dynamic *mp*.
- Trombone:** Measures 2-3, dynamic *mp*.
- Timpani:** Measures 2-3, dynamic *p*.
- Percussion:** Suspended Cymbal, measures 2-3, dynamic *ppp*.
- Violin I:** Measures 2-3, dynamic *p*, includes instruction "(begin gliss. on beat 2)".
- Violin II:** Measures 2-3, dynamic *p*.
- Viola:** Measures 2-3, dynamic *mp*.
- Violoncello:** Measures 2-3, dynamic *mp*.
- Contrabass:** Measures 2-3, dynamic *mp*.

4 5 6

Picc. *mp*

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc.

Vln. I *p*

Vln. II *p*

Vla.

Vc.

Cb.

tr

A

Picc. *mf* *mp*

Fl. *mf* *mp*

Ob. *mf* *mp*

Cl. *mf* *mp*

Bari. Sax. *p*

Hn.

Tpt.

Tbn. *p*

Timp. *pp*

Perc. *mf* Wood block

Crot. *p* Bowed Crotales
p let crotales ring (bowed or struck) throughout piece

A

Vln. I *mp* *pp* *p*

Vln. II *mp* *pp*

Vla. *mp* pizz. arco

Vc. *mp* pizz. arco

Cb. *mp* col legno arco

10 11 12

Picc. *pp*

Fl.

Ob.

Cl.

Bari. Sax. *pp*

Hn. *pp*

Tpt. *pp*

Tbn.

Timp.

Crot.

Vln. I *p*

Vln. II *pp* *p*

Vla. *mf* *p*

Vc. *p*

Cb. *pp* sul pont.

Detailed description of the musical score: This page contains measures 10, 11, and 12 of a symphonic work. The score is arranged in a standard orchestral format. The woodwind section includes Piccolo, Flute, Oboe, Clarinet, Bassoon, and Horns. The brass section includes Trumpets and Trombones. The percussion section includes Timpani and Cymbals. The string section includes Violins I and II, Viola, Violoncello, and Contrabass. The woodwinds and strings play melodic lines, while the brass and percussion provide rhythmic support. Dynamics range from *pp* (pianissimo) to *mf* (mezzo-forte). The Contrabass part includes a 'sul pont.' instruction, indicating playing on the bridge.

Picc.
 Fl. *mf*
 Ob. *mf*
 Cl. *mf*
 Bari. Sax. *p* *f*
 Hn. *p* *f*
 Tpt. *mp* *mf*
 Tbn. *mp* *mf*
 Timp.
 Cro.
 Vln. I
 Vln. II
 Vla. *mf*
 Vc.
 Cb. *p* *f*

Musical score for orchestra and woodwinds, measures 13-15. The score includes parts for Piccolo, Flute, Oboe, Clarinet, Bass Saxophone, Horn, Trumpet, Trombone, Timpani, Crotonal, Violin I, Violin II, Viola, Violoncello, and Contrabass. Dynamics range from *p* (piano) to *f* (forte). The woodwinds and strings play melodic lines, while the brass and bass saxophone provide rhythmic accompaniment. The Piccolo part is mostly rests. The Flute, Oboe, and Clarinet parts feature melodic lines with slurs. The Bass Saxophone part has a dynamic shift from *p* to *f*. The Horn part has a dynamic shift from *p* to *f*. The Trumpet and Trombone parts have dynamic shifts from *mp* to *mf*. The Viola part has a dynamic shift from *mf*. The Violoncello and Contrabass parts have dynamic shifts from *p* to *f*.

16 **B** 18

Picc. Fl. *f* Ob. *f* Cl. *f* Bari. Sax. Hn. Tpt. Tbn. 4 2 2 4 2 2 Timp. *ppp* *mp* Croc. Vln. I *mf* Vln. II *mf* Vla. *mp* *mf* Vc. *mf* Cb.

Detailed description: This page of a musical score covers measures 16, 17, and 18. A section marker 'B' is placed above measure 17. The woodwind section includes Piccolo (Picc.), Flute (Fl.), Oboe (Ob.), Clarinet (Cl.), and Bassoon (Bari. Sax.), all playing a melodic line with a dynamic marking of *f*. The brass section includes Horn (Hn.), Trumpet (Tpt.), and Trombone (Tbn.), with the Tpt. and Tbn. parts featuring rhythmic patterns and dynamic markings of *ppp* and *mp*. The percussion section includes Timpani (Timp.) and Crotales (Croc.). The string section includes Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and Contrabass (Cb.), with dynamic markings of *mf* and *mp*. The score is written in a standard musical notation with various clefs and dynamic markings.

19 20 21 7

Picc. *ff*

Fl. *ff*

Ob. *ff*

Cl. *ff*

Bari. Sax. *ff*

Hn. *ff*

Tpt. *ff*

Tbn. *ff*

Timp. *ff* *p* *f*

Perc. Bass drum *mp* *f* *mp*

Vln. I *f*

Vln. II *f*

Vla. *f* *mp*

Vc. *f*

Cb. *ff*

22 23

Picc. Fl. Ob. Cl. Bari. Sax. Hn. Tpt. Tbn. Timp. Perc. Vln. I Vln. II Vla. Vc. Cb.

mf *ff* *f* *f*

4 2 2 4 4 4 4

3 3

Detailed description: This page of a musical score covers measures 22 and 23. The woodwind section (Piccolo, Flute, Oboe, Clarinet, Bassoon) features melodic lines with slurs and accents. The brass section (Horn, Trumpet, Trombone) plays rhythmic patterns with dynamic markings of *mf* and *ff*. The percussion part includes a snare drum roll in measure 22 and a cymbal in measure 23. The string section (Violin I, Violin II, Viola, Violoncello, Contrabass) provides harmonic support with sustained notes and rhythmic accompaniment. Measure 23 includes a triplet in the Piccolo part and a *f* dynamic marking in the Violin II and Viola parts.

Picc. **C**

Fl.

Ob.

Cl.

Bari. Sax.

Hn. 2 2 4 2

Tpt. 2 2 4 2

Tbn. 2 2 4 2

Timp. *fff*

Perc. *f*

Vln. I **C** *ff*

Vln. II *ff*

Vla. *ff*

Vc. *ff*

ord.

Cb.

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc.

Vln. I

Vln. II

Vla.

Vc.

Cb.

ff

89

Detailed description: This page contains the musical score for measures 26 and 27 of an orchestral work. The score is arranged in a system with 14 staves. The instruments are: Piccolo (Picc.), Flute (Fl.), Oboe (Ob.), Clarinet (Cl.), Bass Saxophone (Bari. Sax.), Horns (Hn.), Trumpets (Tpt.), Trombones (Tbn.), Timpani (Timp.), Percussion (Perc.), Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vc.), and Contrabass (Cb.). Measures 26 and 27 are shown. The Piccolo part is mostly rests. The Flute, Oboe, and Clarinet parts play a rapid sixteenth-note pattern. The Bass Saxophone part has a similar pattern. The Horns, Trumpets, and Trombones parts have a slower, more rhythmic pattern with some rests. The Timpani part has a steady eighth-note pattern starting in measure 26. The Percussion part has a simple rhythmic pattern. The Violin I part has a few notes in measure 26. The Violin II, Viola, and Contrabass parts have a steady eighth-note pattern. The Violoncello part has a few notes in measure 26. The dynamic marking *ff* is present under the Timpani part in measure 26. The page number 10 is in the top left, 26 and 27 are at the top, and 89 is in the top right and middle right.

28 $\frac{9}{8}$

29 $\frac{12}{8}$

11

Musical score for measures 28 and 29. The score is divided into two systems. The first system (measures 28-29) features woodwinds (Piccolo, Flute, Oboe, Clarinet, Bass Saxophone) and brass (Horn, Trumpet, Trombone). The second system (measures 28-29) features percussion (Timpani, Percussion) and strings (Violin I, Violin II, Viola, Violoncello, Contrabass). The time signature changes from 9/8 to 12/8 between measures 28 and 29. The woodwinds play a melodic line with eighth notes, while the brass and strings provide harmonic support with various rhythmic patterns. The percussion includes a steady drum pattern.

30 31 32

Picc. *p* 2

Fl. *pp*

Ob. *pp*

Cl. *pp*

Bari. Sax. *mf*

Hn. *mp* 2

Tpt. *mp* 2

Tbn. *mf*

Timp. *pp*

Crot. (arco) *pp*

Vln. I *pp* arco

Vln. II pizz. *pp* arco

Vla. *mf* pizz. *p*

Vc. *mf*

Cb. *mf*

D Adrift

Picc. *pp* pitch bend

Fl. *pp* pitch bend

Ob. *pp*

Cl. *pp*

Bari. Sax.

Hn. *ppp*

Tpt. con sord.

Tbn. con sord.

Timp. *pp*

Perc. Cym. *ppp* *p*

Crot.

D Adrift

Vln. I *pp*

Vln. II *pp*

Vla. arco *mf* *p*

Vc. *p* pizz.

Cb. *p* pizz. *pp*

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn. *con sord.* *p* (con sord.)

Tpt. (con sord.) *ppp*

Tbn. (con sord.) *ppp*

Timp. *ppp*

Crot. (arco) *pp*

Vln. I *pp*

Vln. II *pp*

Vla. *col legno* *arco* *pizz.*

Vc. *col legno* *pizz.* *arco* *pp*

Cb.

Picc. *mf* 3

Fl. *mf* 3

Ob.

Cl. *p* *pp* *mp*

Bari. Sax. *mp* *p* *mp*

Hn. *mp* flz.

Tpt. *mp*

Tbn. *mp*

Timp. *p*

Perc. *mf* *pp*

Vln. I *p*

Vln. II *p* arco

Vla.

Vc. *p* arco

Cb. *p* arco

49

50 **15** **8** **17** **8**

Picc. *mf* *tr* *f* *pp*

Fl. *mp* *ff*

Ob. *mp* *ff*

Cl. *f* *f* *pp*

Bari. Sax. *mf* *f* *pp*

Hn. *p* *f* *pp* ord.

Tpt. *p* *f* *pp*

Tbn. *mf* *f* *pp*

Timp. *f* *p*

Perc. *f* *f* B. drum

(second gliss. begins on beat 3)

Vln. I *mf* *pp*

Vln. II *mf* *pp*

Vla. *mf* *pp*

Vc. *mf* *pp*

Cb. *mf* *pp*

Picc. -

Fl. -

Ob. -

Cl. -

Bari. Sax. *mp* *pp* *mf* *pp* *mp*

Hn. -

Tpt. -

Tbn. *mp* *pp* *mf* *pp*

Timp. *p*

Perc. *p* W. block

Vln. I -

Vln. II -

Vla. -

Vc. -

Cb. *mp* *pp* *mf* *pp* *mp*

senza sord.

Picc. *p*

Fl. *p*

Ob. *p*

Cl. *p*

Bari. Sax. *p* *p* 3 *p* 3 *p* 3

Hn. *p* (senza sord.)

Tpt. *p* senza sord.

Tbn. *mf* *p* *pp* *mf*

Timp. *pp* 3

Perc. W. block

Crot. *pp* (arco)

Vln. I *pizz. non div.* *mp* *sim.* *mp*

Vln. II *pizz.* *mp*

Vla. *mp*

Vc. *non div.* *p*

Cb. *col legno* *mp* *arco* 3 *p* 3 *mp*

56 57

Picc. *mf* *ff*

Fl. *mp* *mf* *ff* *p*

Ob. *mp* *ff* *mp*

Cl. *f* *ff* *mp*

Bari. Sax. *mf* *mf* *ff* *pp*

Hn. *mf*

Tpt. *mf*

Tbn. *mf*

Timp. *f*

Perc. *p* *mf*

B. drum

Vln. I *f* arco non div.

Vln. II *ff* arco non div.

Vla. *ff* arco non div.

Vc. *f*

Cb. *f*

Picc.
 Fl. *p*
 Ob. *p*
 Cl. *p*
 Bari. Sax. *mp* *p* *p* *3*
 Hn. *pp* *p*
 Tpt. *pp* *p* con sord. (until m. 117)
 Tbn. *pp* *mp* *p* *pp* *mf*
 Timp. *pp* *3* *pp* *3*
 Perc. *pp* (arco) To Crot. Crotales (struck)
 Crotales *pp* *2* *pp*
 Vln. I pizz. non div. *mp*
 Vln. II pizz. *mp*
 Vla. *mp*
 Vc. *pp* non div. *p*
 Cb. *pp* *mf* *p* *3* *3*

G 62 **15** 63

Picc. *pp*

Fl. *pp*

Ob. *pp*

Cl. *pp*

Bari. Sax. *mf pp*

Hn. *f*

Tpt. *pp mf ppp*

Tbn. *pp*

Timp. *f*

Crot. *2 2 2 2 2 2*

G 15

Vln. I *arco pp*

Vln. II *arco pp*

Vla. *arco pp*

Vc. *f pp*

Cb. *non div. f pp mf ppp*

Picc. *mf* *pp*

Fl.

Ob. *mf* *pp*

Cl.

Bari. Sax. *mf* *pp*

Hn.

Tpt. *p* *mf* *pp*

Tbn.

Timp.

Crot. *mf* *pp*

Vln. I *pp*

Vln. II *pp*

Vla. *pp*

Vc.

Cb.

Unrelenting Spirit

Picc. $\text{♩} = 74$

Fl.

Ob.

Cl.

Bari. Sax.

Hn. *con sord.*

Tpt. *pp* *mf* *pp* *con sord.*

Tbn.

Timp. *pp* *mf* *pp*

Crot. *To Arco Crot. Bowed Crotales* *pp*

Vln. I $\frac{12}{8}$ *rit.* $\text{♩} = 74$ *Unrelenting Spirit*

Vln. II

Vla. *pp*

Vc. *non div.* *pp* *mf* *pp*

Cb. *pizz.* *mp*

Picc. *mp*

Fl. *mp*

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc. *pp* W. block

Crot.

Vln. I *pp* pizz. arco *p*

Vln. II *pp*

Vla.

Vc. *pp* (pizz.)

Cb. *pp*

76 77 78

Picc. Fl. Ob. Cl. Bari. Sax. Hn. Tpt. Tbn. Timp. Perc. Vln. I Vln. II Vla. Vc. Cb.

pp (con sord.) *mp* *pp* *mp* *pp* *mp* *pp* *p* arco *pp* *mp* *mp* *arco* *mp*

This musical score page contains measures 76, 77, and 78. The instruments are arranged in the following order from top to bottom: Piccolo, Flute, Oboe, Clarinet, Bass Saxophone, Horn, Trumpet, Trombone, Timpani, Percussion, Violin I, Violin II, Viola, Violoncello, and Contrabass. The score includes various musical notations such as rests, notes, and dynamic markings. Key dynamic markings include *pp* (pianissimo), *mp* (mezzo-piano), and *p* (piano). Performance instructions like "(con sord.)" and "arco" are also present. The Percussion part is marked with a double bar line and a triangle symbol. The string parts (Violin I, Violin II, Viola, Violoncello, and Contrabass) feature a mix of pizzicato and arco playing techniques.

Picc.
 Fl. *mf* *f* *pp*
 Ob. *mf* *f* *pp*
 Cl. *mf*
 Bari. Sax. *p* *ff* *pp* *p*
 Hn. *f* *pp*
 Tpt. *f* *pp*
 Tbn. *f* *pp*
 Timp. *mf* *pp*
 Perc. *pp*
 Vln. I *mf* *pp*
 Vln. II *mf* *pp*
 Vla. *f* *p*
 Vc. *p*
 Cb. *f* *p*

flz. ord. flz.
 arco
 non div.

82 83 84

Picc. *f* 3

Fl. *f*

Ob. *f*

Cl. *f* tr (b)

Bari. Sax. *f* ord. tr

Hn. *f* *pp* *mf* *pp*

Tpt. *f* *pp* *mf*

Tbn. *f*

Timp. *ff* *mf* *mp* 3 2 2 2 2 2 2 2 2 2

Perc. *f* *mp*

Vln. I *f* pizz.

Vln. II *mp* *pp*

Vla. *p* *pp* *mf*

Vc. *pp* *mf* *pp*

Cb. *p* non div.

Picc.
 Fl.
 Ob.
 Cl.
 Bari. Sax.
 Hn.
 Tpt.
 Tbn.
 Timp.
 Perc.
 Vln. I
 Vln. II
 Vla.
 Vc.
 Cb.

Dynamics: *mf*, *pp*, *ff*, *p*, *mp*, *arco*, *tr*, *tr (b)*, *2*

88 89 90

Picc. *mf*

Fl.

Ob.

Cl.

Bari. Sax. *pp* *ff* *pp*

Hn. *mf* *pp* *mf* *pp* *mf*

Tpt. *pp* *mf* *pp* *mf* *pp*

Tbn. *ff* *pp*

Timp.

Perc.

Vln. I *p*

Vln. II

Vla. *pp* *mf* *pp* *mf* *pp* *mf*

Vc. *mf* *pp* *mf* *pp* *mf* *pp*

Cb. *pp* *ff* *pp*

tr

J

92

93

31

Picc. *f* *mp*

Fl. *f* *mp*

Ob. *f* *mp*

Cl. *f* *mp*

Bari. Sax. *mp*

Hn. *f* senza sord.

Tpt. *f* senza sord.

Tbn. *f* *mp*

Timp. *mf* *p*

Perc. *mf* W. block

Crot. *p* Bowed Crotales

Vln. I *p* *pp* *p*

Vln. II *p* *pp*

Vla. *mp* pizz. arco

Vc. *mp* pizz. arco

Cb. *mp* col legno arco

94 95 96

Picc. Fl. Ob. Cl. Bari. Sax. Hn. Tpt. Tbn. Timp. Croc. Vln. I Vln. II Vla. Vc. Cb.

(senza sord.) *pp*

(senza sord.) *pp*

p

pp *p* *p*

p

sul pont. *pp*

Detailed description of the musical score: The score is for measures 94, 95, and 96. It includes parts for Piccolo, Flute, Oboe, Clarinet, Bassoon, Horn, Trumpet, Trombone, Timpani, Crotales, Violin I, Violin II, Viola, Violoncello, and Contrabass. The woodwinds and strings play melodic lines with various dynamics like *pp* and *p*. The brass section (Horn, Trumpet, Trombone) has specific instructions: Horns play '(senza sord.)' with *pp* dynamics, and Trumpets play '(senza sord.)' with *pp* dynamics. The Viola and Violoncello parts have *p* dynamics. The Contrabass part has a 'sul pont.' instruction and *pp* dynamics. The percussion parts (Timp., Croc.) are mostly rests with some light accents.

This musical score page contains measures 97 and 98 for a symphony orchestra. The instruments and their parts are as follows:

- Picc.**: Piccolo flute, rests in measure 97 and plays a melodic line in measure 98.
- Fl.**: Flute, plays a melodic line in both measures, marked *mf*.
- Ob.**: Oboe, plays a melodic line in both measures, marked *mf*.
- Cl.**: Clarinet, plays a melodic line in both measures, marked *mf*.
- Bari. Sax.**: Baritone saxophone, plays a rhythmic accompaniment of eighth notes in both measures, marked *p*.
- Hn.**: Horn, plays a rhythmic accompaniment of eighth notes in both measures, marked *p*.
- Tpt.**: Trumpet, plays a rhythmic accompaniment of eighth notes in both measures, marked *mp*.
- Tbn.**: Trombone, plays a rhythmic accompaniment of eighth notes in both measures, marked *mp*.
- Timp.**: Timpani, rests in both measures.
- Crot.**: Crotales, rests in both measures.
- Vln. I**: Violin I, plays a sustained chord in both measures.
- Vln. II**: Violin II, plays a sustained chord in both measures.
- Vla.**: Viola, plays a sustained chord in both measures.
- Vc.**: Violoncello, plays a sustained chord in both measures.
- Cb.**: Contrabass, plays a rhythmic accompaniment of eighth notes in both measures, marked *p*.

99 100

Picc. *f*

Fl. *f*

Ob. *f*

Cl. *f*

Bari. Sax. *f*

Hn. *f*

Tpt. *mf*

Tbn. *mf* 2 2 4 2 4 4 2 4

Timp.

Crot.

Vln. I

Vln. II

Vla.

Vc.

Cb. *f*

K

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Vln. I

Vln. II

Vla.

Vc.

Cb.

mp

mf

2 2 2 4

2 4

3 3

This musical score page contains the notation for measures 103 and 104. The instruments and their parts are as follows:

- Picc.**: Piccolo flute, measures 103-104, *ff*.
- Fl.**: Flute, measures 103-104, *ff*.
- Ob.**: Oboe, measures 103-104, *ff*.
- Cl.**: Clarinet, measures 103-104, *ff*.
- Bari. Sax.**: Bass saxophone, measures 103-104, *ff*.
- Hn.**: Horn, measures 103-104, *ff*.
- Tpt.**: Trumpet, measures 103-104, *ff*.
- Tbn.**: Trombone, measures 103-104, *ff*.
- Timp.**: Timpani, measures 103-104, *ff* and *mp*.
- Perc.**: Percussion, measures 103-104, *pp* and *f*. Includes a wood block ("W. block").
- Vln. I**: Violin I, measures 103-104.
- Vln. II**: Violin II, measures 103-104.
- Vla.**: Viola, measures 103-104.
- Vc.**: Violoncello, measures 103-104.
- Cb.**: Contrabass, measures 103-104, *ff*.

The score features various musical notations including slurs, accents, and dynamic markings. The wood block part in measure 104 includes the instruction "W. block" above the staff and "pp" below it.

Picc.
 Fl.
 Ob.
 Cl.
 Bari. Sax.
 Hn.
 Tpt.
 Tbn.
 Timp.
 Perc.
 Vln. I
 Vln. II
 Vla.
 Vc.
 Cb.

Musical score for measures 105 and 106. The score includes parts for Piccolo, Flute, Oboe, Clarinet, Bass Saxophone, Horn, Trumpet, Trombone, Timpani, Percussion, Violin I, Violin II, Viola, Violoncello, and Contrabass. The percussion part includes a Bass Drum (B. drum) with dynamics *f*, *mp*, and *mf*. The woodwinds and strings play melodic lines with various articulations and dynamics. The brass section features rhythmic patterns with accents and dynamic markings.

107

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc.

Vln. I

Vln. II

Vla.

Vc.

Cb.

Picc. **L**

Fl.

Ob.

Cl.

Bari. Sax.

Hn. 2 2 4 2

Tpt. 2 2 4 2

Tbn. 2 2 4 2

Timp. *ff*

Perc. *f*

Vln. I **L**

Vln. II *ff*

Vla. *ff*

Vc.

Cb. ord.

109 *tr* 110

Picc. *f* *ff*

Fl.

Ob.

Cl.

Bari. Sax.

Hn. 2 4 2 2

Tpt. 2 4 2 2

Tbn. 2 4 2 2

Timp. *fff* *ff*

Perc.

Vln. I

Vln. II

Vla.

Vc.

Cb.

This musical score page, numbered 111, features a variety of instruments. The Piccolo part is mostly silent. The Flute, Oboe, and Clarinet parts play a complex, rhythmic melody with many slurs and accents. The Bass Saxophone part has a few notes with slurs. The Horn, Trumpet, and Trombone parts play a simple melody with slurs and accents. The Timpani part has a few notes with slurs. The Percussion part has a few notes with slurs. The Violin I part is silent. The Violin II, Viola, and Contrabass parts play a simple melody with slurs and accents. The Violoncello part is silent.

Picc. *ff*

Fl. *ff*

Ob. *ff*

Cl. *ff*

Bari. Sax. *mp* *ff*

Hn. *mp* *ff*

Tpt. *mp* *ff*

Tbn. *mp*

Timp. *fff*

Perc. *ff*

Vln. I *ff*

Vln. II *ff*

Vla. *ff*

Vc. *ff*

Cb. *ff*

tr.

flz.

Snare drum

pizz.

Musical score for page 43, measures 114-116. The score includes parts for Piccolo, Flute, Oboe, Clarinet, Bass Saxophone, Horn, Trumpet, Trombone, Timpani, Percussion, Violin I, Violin II, Viola, Violoncello, and Contrabass. Dynamics range from piano (*p*) to fortissimo (*ff*). The Piccolo part features a trill (*tr*) in measure 114. The Flute part includes triplets in measure 116. The Bass Saxophone part features a quartet (*4*) in measure 116. The Percussion part includes triplets and a fortissimo (*ffp*) dynamic. The Violin I and II parts are marked *arco*. The Viola part is marked *arco non div.* and features a quartet (*4*) in measure 116.

115 116

Picc. *ff*

Fl. *ff*

Ob. *pp* *f* *ff*

Cl. *f* *ff*

Bari. Sax. *ff*

Hn. *f* *ff*

Tpt. *f* *ff*

Tbn. *ff*

Timp. *ff*

Perc. *ff* B. drum *ff*

Vln. I *p* *f*

Vln. II *mf* *f*

Vla. *mf*

Vc. *ff*

Cb. *ff*

117 118 45

Picc. *f* *fff* *ff*

Fl. *f* *fff* *ff*

Ob. *f* *fff* *ff*

Cl. *f* *fff* *ff*

Bari. Sax. *f* *fff* *ff*

Hn. *f* *fff* *ff*

Tpt. *f* *fff* *ff*

Tbn. *f* *fff* *ff*

Timp. *f* *fff* *ff*

Perc. *fff* *fff* *ff*

Vln. I *f* *fff* *ff*

Vln. II *f* *fff* *ff*

Vla. *f* *fff* *ff*

Vc. *f* *fff* *ff*

Cb. *f* *fff* *ff*

flz. *ord.*

senza sord.

S. drum

non div.

mp

121 122 tr.....47

The score consists of 13 staves. Measures 121 and 122 are shown. Measure 121 includes a Piccolo part with a trill and a double bar line. Measure 122 features a Piccolo trill with a fermata and a double bar line. The Percussion part has a complex rhythmic pattern with triplets and accents. The string parts (Violin I, Violin II, Viola, Vc., Cb.) have a steady eighth-note accompaniment. The woodwind parts (Flute, Oboe, Clarinet, Horns, Trumpets, Trombones) have various rhythmic patterns, including eighth and sixteenth notes, and some parts have articulation marks like accents and slurs.

tr

124

8/8

12/8

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc.

Vln. I

Vln. II

Vla.

Vc.

Cb.

3

3

2

4

2

4

non div.

8/8

12/8

Detailed description: This is a page of a musical score for an orchestra, covering measures 123 and 124. The score is arranged in a standard orchestral layout with staves for woodwinds, brass, percussion, and strings. The woodwind section includes Piccolo (Picc.), Flute (Fl.), Oboe (Ob.), Clarinet (Cl.), and Bass Saxophone (Bari. Sax.). The brass section includes Horns (Hn.), Trumpets (Tpt.), and Trombones (Tbn.). The percussion section includes Timpani (Timp.) and Percussion (Perc.). The string section includes Violins I (Vln. I), Violins II (Vln. II), Viola (Vla.), Violoncello (Vc.), and Contrabass (Cb.). Measure 123 features a Piccolo part with a trill (tr) and a triplet of eighth notes. The woodwinds and strings play rhythmic patterns. Measure 124 shows a change in the Piccolo part, with a new melodic line and a change in the time signature to 12/8. The strings continue with their rhythmic accompaniment. The score includes various musical notations such as rests, notes, stems, beams, and dynamic markings.

125 **12** 126 tr 49

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc.

Vln. I

Vln. II

Vla.

Vc.

Cb.

Picc. *ff* *p*
 Fl. *ff* *ppp*
 Ob. *ff* *ppp*
 Cl. *ff* *ppp*
 Bari. Sax. *ff* *pp* *mf* con sord.
 Hn. *ff* *ppp*
 Tpt. *ff* *mp* con sord.
 Tbn. *ff* *pp* *mp*
 Timp. *fff* *p*
 Perc. *fff* (arco)
 Croc. *p*
 Vln. I *ff* *ppp*
 Vln. II *ff* *ppp*
 Vla. *ff* *ppp*
 Vc. *ff* *ppp*
 Cb. *ff* *pp* *mf*

Picc.

Fl.

Ob.

Cl.

Bari. Sax.

Hn.

Tpt.

Tbn.

Timp.

Perc.

Cym.

Crot.

Vln. I

Vln. II

Vla.

Vc.

Cb.

pp *mf* *p* *f* *pp* *mp* *mf* *f* *pp* *mf*

(con sord.)

(con sord.)

con sord.

3 3 3

3 2 2

3

3 3 3

134 135 136

Picc. *ppp*

Fl. *p* — *mf* *p*

Ob. *p* — *mf* *p*

Cl. *p* — *mf* *p*

Bari. Sax. *pp* — *f* *p*

Hn. *mf* *p*

Tpt. *mf*

Tbn. *mf*

Timp. *mf* — *f* *choke* *mf*

Perc. *f* (arco)

Vln. I *ppp*

Vln. II *ppp*

Vla. *ppp*

Vc. *ppp*

Cb. *ppp* — *f*

Picc. *ff*

Fl. *ff* *p*

Ob. *mp*

Cl. *ff* *mp*

Bari. Sax. *ff* *pp* *mf*

Hn. *pp*

Tpt. *pp*

Tbn. *mp*

Timp. *pp*

Perc. *p*

Vln. I *f* arco non div. *pizz.* non div.

Vln. II *ff* arco non div. *mp* *pizz.*

Vla. *ff* *mp*

Vc. *f* *pp*

Cb. *f* *pp* *mf*

Picc. Fl. Ob. Cl. Bari. Sax. Hn. Tpt. Tbn. Timp. Perc. Vln. I Vln. II Vla. Vc. Cb.

f *p* *pp* *mp* *non div.* *3* *2*

S. drum

Detailed description: This page contains the musical score for measures 141 and 142 of a piece. The score is arranged in a standard orchestral format with staves for woodwinds, brass, percussion, and strings. Measures 141 and 142 are indicated at the top. The Piccolo, Flute, Oboe, Clarinet, and Baritone Saxophone parts are silent in both measures. The Horn, Trumpet, and Trombone parts enter in measure 142 with a piano (*p*) dynamic. The Horn part features a melodic line with eighth notes. The Trumpet part has a similar melodic line with a sharp sign. The Trombone part has a lower melodic line with a sharp sign and a fermata. The Timpani part plays a rhythmic pattern of eighth notes with a forte (*f*) dynamic. The Snare Drum part plays a similar rhythmic pattern with a forte (*f*) dynamic. The Violin I and Violin II parts are silent. The Viola part is silent. The Violoncello part enters in measure 142 with a mezzo-piano (*mp*) dynamic, playing a sustained chord with a fermata and the instruction "non div.". The Contrabass part enters in measure 142 with a mezzo-piano (*mp*) dynamic, playing a triplet of eighth notes followed by a sustained chord with a fermata and the instruction "non div.". Dynamics include *f*, *p*, *pp*, and *mp*. Performance markings include "non div.", "2", and "3".

Picc. *ff* *fff*
 Fl. *fff*
 Ob. *fff*
 Cl. *fff*
 Bari. Sax. *ff* *fff*
 Hn. *fff*
 Tpt. *fff*
 Tbn. *fff*
 Timp. *fff*
 Perc. *fff*
 Vln. I *fff* pizz. non div.
 Vln. II *fff* pizz. non div.
 Vla. *fff*
 Vc. *fff*
 Cb. *fff*