# Towards an understanding of Mozart's use of tempo markings and proportion: Temporal strategies in the finales of *Le nozze di Figaro*

**Peter Keenan**
BA (Hons), University of York

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Master of Music
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Music
School of Culture and Creative Arts
College of Arts
University of Glasgow
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ORCID ID: https://orcid.org/0000-0001-6603-7920

## Abstract

This dissertation uses the two chain finales from *Le nozze di Figaro* as a case study, exploring how Mozart uses tempo and proportion to manipulate time. Each tempo indication and metre employed in both the acts II and IV finales is surveyed using three treatises which Mozart was possibly engaged with, two of which were well established by the mid-1780s (Quantz's *Versuch einer Anweisung die Flöte traversiere zu spielen,* Kirnberger's *Die Kunst des reinen Satzes in der Musik*), while the other was more incipient (Koch's *Versuch einer Anleitung zur Composition*). This enquiry highlights the prospect that Mozart used metre in a typically idiomatic manner for the eighteenth century whilst also heralding a more innovative use of metre. What emerges is the possibility that Mozart's approach to metre was much more nuanced and elegant than one might expect.

While the study of tempo and metre forms an evaluation of Mozart's overt use of time in these finales, this dissertation attempts to reopen critical discourse surrounding his covert use of proportion. Consideration is given to Mozart's apparently advanced mathematical ability which may have influenced his intellectual curiosity as a composer. Through investigating the apparent cutting of a 69-bar section during the 1786 production of *Le nozze di Figaro*, the resulting presence of Golden Section is given a critical assessment. Aspects of how Mozart may have become aware of this ratio are deliberated through his association with Freemasonry.

The thesis culminates with the suggestion that further research is merited both with regards to Mozart's use of tempo indications and metre and proportion, through which we might gain a greater understanding of the composer's temporal strategies and how they were used in the chain finales in particular.

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## Acknowledgements

The culmination of this research could not have been achieved without the help of a great number of people. For those who know me, it is no secret that maintaining the balance between progressing my research while working has been a considerable challenge for me. That this has come to fruition at all is the result of support in every aspect of my life. As my first foray into research and Mozart studies, it has been a whirlwind adventure. I hope to be able to pursue it further.

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# Introduction

> It is impossible for me to describe the Mackerras signature in the pit, but I hope it means, above all, *setting the right tempo* […].[1]

## 1.1 — Context

As I perused the pages of *Die Zauberflöte* for the first time, preparing for my first venture both into conducting opera and indeed conducting a work by Mozart, it was immediately clear that this music—the finales in particular—required an exceptional level of judgement. It was not clear what was 'right'. Slow tempo markings are combined with *alla breve* time signatures, while quicker tempos—Allegro molto, for example—are in common time. It challenges the twenty-first-century musicianship with which we are now educated. Momentarily disregarding notions of 'speed', what then is the hierarchy of the bar? Are the stresses in two or four, one or three? Is this, then, conveyed better in a quicker or slower tempo? I was struck at the specificity, which I had not yet associated with eighteenth-century notation. It became clear that the manipulation of time and how it was perceived was an important component in Mozart's compositional vocabulary. I call this his temporal strategy.

This term encompasses two elements of how time is experienced in a musical passage, the rate of speed at which it passes and its duration: tempo and proportion. The former has received reasonable amounts of investigation in recent years, while the latter has not. In this dissertation, I will explore both of these aspects and how they intersect using the acts II and IV finales of *Le nozze di Figaro* as a case study.

## 1.2 — State of the field

Debates about Mozart's tempo indications are hardly new. In 1815 Gottfried Weber put out an advertisement in the *Allgemeine musikalische Zeitung* calling for witnesses of the composer's own performances of *Die Zauberflöte* in 1791 to come forth and provide testimony to prove that the Andante 6/8 tempo of 'Ach ich fühl's' had slowed in more recent

1 Mackerras, 'Opera conducting' in Bowen (ed.),*The Cambridge Companion to Conducting*, 78

performances.[2] Though the accounts themselves cannot be held as accurate claims—especially considering they were given almost twenty-five years later—this is significant as it implies that there may have been a notable difference in the interpretation of this aria between 1791 and as early as 1815. More importantly, it demonstrates that this difference was acknowledged.

Recent discourse on Mozart's temporal strategies tends to focus on tempo. Two studies stand out in particular for their exploration of Mozart's tempo indications across his entire *oeuvre*. In 1988 Jean-Pierre Marty published *The Tempo Indications of Mozart*, a colossal volume which catalogues every tempo marking written by the composer. His methodology centres around connecting similar combinations of tempo and metre. For example, he compares the aria 'Del più sublime soglio' from *La clemenza di Tito* and the opening section of the act IV finale of *Le nozze di Figaro* ('Pian, pianin le andrò più presso').[3] Though this in itself is interesting, it seems flawed to build a thesis on such an approach. Six years had passed between *Figaro* and *Tito*, so how can we be sure that Mozart's temporal strategy had not developed in that time? What Marty lacks is the historicist's angle. His lamentably short bibliography consists of only twentieth-century sources, making no effort to investigate how these tempo markings might relate to their contemporary theories. Helmut Breidenstein's *Mozarts Tempo-System: Ein Handbuch für die professionelle Praxis* (2015) takes a completely different tack to Marty's. Breidenstein posits an almost formulaic notion that tempo is derived from the combination of tempo indication, metre and the shortest note-value. These three elements are, as I will demonstrate, inseparable in eighteenth-century theory. However, Breidenstein quite liberally dismisses key concepts, in particular the use of the human pulse as a means to establish tempo, which he regards as unreliable.[4]Although his concerns are reasonable, such coupling between the human pulse and tempo has been present in music theory for centuries and, according to Mattheson and Quantz, was still in practice in the eighteenth century.[5]

Mozart's use of metre has also been subject to research in its own right. Wye Jamison Allanbrook's *Rhythmic Gestures in Mozart* explores metre as something which captures

2 Marty, *The Tempo Indications of Mozart*, 222
3 Ibid. 7–8
4 Breidenstein, *Mozarts Tempo-System: Ein Handbuch für die professionelle Praxis*
5 See Guariento, *From Monochord to Weather-glass:* musica speculativa *and its development in Robert Fludd's Philosophy*, 2014

topical and stylistic connections. Heavily based in topic theory, Allanbrook presents the notion of metre almost as a commentary on characters and the relationships between them. Danuta Mirka's more recent *Metric Manipulations in Haydn and Mozart* places perception and cognition at the centre of her investigation of eighteenth-century music theory and provides possibly the most extensive assessment of Koch's metrical theory to date.

Discourse runs thin with regards to proportion in Mozart's music. Jane Perry-Camp's article from 1979 explores the regularly espoused notion that proportions in Mozart's works were 'perfect' and considers how one might experience this. In an article for *Mathematics Magazine* in 1995, John F. Putz presents a mathematical examination of the piano sonatas and whether or not Golden Section can be found in them. Other than these, proportion in Mozart appears to lay in the realm of anecdotal sources. This dissertation seeks to redress this oversight by presenting a case for further investigation in this area of Mozart scholarship.

Perhaps the most useful document which sets out the need for a greater understanding of Mozart's temporal strategy is Ian Cook's doctoral thesis of 2008.[6] The goal of his research is to assess and 'prove' Marty's proposed tempo indications in *Le nozze di Figaro* and *Die Zauberflöte*. In doing so, he collates the chosen tempos from an extensive selection of recordings of these operas over the last seventy years. This field study is highly valuable because it demonstrates how extremely varied the interpretation of some of Mozart's tempo indications have been, while others are read similarly across the board. The meta-narrative of this study could suggest that Mozart's notation is inherently ambiguous. More likely, it highlights that the understanding of his combination of metre and tempo may have become obscured over the centuries since his death, as already had been observed in the early nineteenth century.

6 Cook, *Tempo Indications of Mozart: An Analytical Study of Performance Practice in the Twentieth Century as it relates to* The Magic Flute *and* The Marriage of Figaro (hereafter Cook, *Analytical Study*)

### 1.3 — Establishing a methodology

It was clear before commencing this research project that any potential for it to bear fruit relied upon a very different focus to that of recent scholarship, particularly with regards to the parameters considered and the methods used. First and foremost, this study will investigate matters pertaining to both proportion and tempo indications, and hitherto the potential relationship between these elements. A fully comprehensive exploration of large swathes of Mozart's *oeuvre* would therefore not suit this approach. Movements from concertos, sonatas and symphonies often feature a single tempo throughout, occasionally two, while spanning a considerable number of bars. Any correlation between tempo and proportion in cases such as these would be moot and would not particularly aid this study. Finales from Mozart's operatic works (primarily from 1786 onward), however, provide an ideal starting point due to their numerous tempo changes, extensive duration (typically longer than a single movement from a concerto or similar) and their structural coherence, which implies a significant level of care and craft.

Initially the remit of this study was to investigate each finale from every act of *Le nozze di Figaro*, *Don Giovanni*, *Così fan tutte* and *Die Zauberflöte* as they share tendencies in duration, symmetry and dramatic initiative. The finales in each of these operas are what has been coined a 'chain finale'. Due to both the aspects being considered and the amount of material generated by each finale, it quickly became apparent that focusing on one of these four operas would benefit the thesis and fit within its scope much better. Being the first of Mozart's operas to use finales in this manner in such an explicit way, *Le nozze di Figaro* represents a pivotal development in his temporal strategy. As a result, this thesis will exclusively explore the acts II and IV finales of this opera.

Both the theoretical parameters and the musical material guiding the focus of the body of this thesis have now been established. Prior to the main chapters (2 and 3) on tempo and proportion respectively, two strands of related research will be presented. First, a brief exploration of the emergence of the chain finale will be given, specifically establishing how

Mozart came to use this device. I will then attempt to establish an intellectual domain with regards to Mozart's relationship with eighteenth-century music theory.

The second chapter assesses the acts II and IV finales of *Figaro* through the contexts of what have become seminal treatises about tempo, metre and rhythm by Quantz, Kirnberger and Koch. Each of the sections in the chain finales are taken in isolation and hypotheses about these theories' application in practice are provided. Through this chapter, it is suggested that Mozart approached metre and tempo in an elegant way which embraces both traditional metric patterns while signalling a more modern understanding of the bar.

The third chapter seeks to reopen the debate about Mozart's use of proportion in compositional structures using the act II finale from *Le nozze di Figaro* as a catalyst. By first demonstrating his interest and unexpectedly advanced skills in number theory, this chapter identifies that in cutting a 69-bar section from the act II finale in the original 1786 production, proportional relationships are illuminated which strikingly conform to Golden Section. Possibilities of how Mozart may have been exposed to this proportion and how he might have calculated it in music are considered.

In the final chapter I attempt to draw a conclusion from these findings. The question of whether or not the proportional relations should influence the tempos chosen in performance is addressed, giving way to considerations on the dialogue between the phenomenological and the clandestine elements identified throughout.

### 1.4 — *'Un quasi nuovo genere di spettacolo'*

The term 'chain finale' is not widely known. Indeed, it is not in any music dictionary and its usage in discourse today is almost exclusively reserved for Mozart's *Le nozze di Figaro*, *Don Giovanni* and *Così fan tutte*. So how did the chain finale come about and was it really Mozart's innovation?

Norbert Miller's introduction to the beautiful facsimile edition of *Figaro* thoroughly outlines the emergence of the chain finale in late eighteenth-century *opera buffa*. Perhaps

the most unexpected part of his overview is the prospect that the chain finale is the product of the librettists' innovations, possibly more so than that of the composer. Italian playwright and librettist Carlo Goldoni (1707–1793) is central not just to the emergence of the chain finale, but also to the flourishing of *opera buffa* in general. One of his main contributions is his advocation of scripted comedy instead of improvisation, which had been the norm. As Edmund Goehring suggests, Goldoni felt that by adopting scripted scenes one could control the pacing of a comic moment much better, thus allowing the audience greater appreciation for 'comic choreography'.[7] In *opera buffa*, this resulted in a reduction of aria-centred action and an increase in ensembles, through which greater control of comic interaction between characters could be achieved. The finales in particular came to be to treated as 'all enveloping *tableaux*' in their own right, typically involving the full cast.[8] Although many librettists and composers were pursuing this new fashion, it is da Ponte's collaboration with Vicente Martin y Soler (1754–1806) in *Il burbero di buon cuore* (1786) which Miller identifies as the moment the literary 'formula' for ending an act in Italian *opera buffa* became crystallised. This was then rapidly repeated in Mozart's *Le nozze di Figaro*, *Don Giovanni*, *Così fan tutte*, Soler's *Una cosa rara* and Salieri's *Axur, re d'Ormus*.[9] Da Ponte's recollection of writing the libretto (the finales in particular) for *Il burbero* is well known and gives the impression that he both loathed and loved the challenge of writing this sort of text.[10]

It is clear that Mozart had been attempting to find some way to improve on the action in his *opera buffa* as early as 1775. Indeed, one could describe the act I finale of *La finta*

7 Goehring, 'The opere buffe', in Keefe (ed.), *The Cambridge Companion to Mozart*, 131–146

8 Miller, '"*Un quasi nuovo generi di spettacolo* ...". Beaumarchais', Da Ponte's, and Mozart's *Folle journée*', 1–21

9 Ibid. 3

10 Translation taken from Allanbrook, *Rhythmic Gestures in Mozart*, 133: 'This finale, which must remain intimately connected with the opera as a whole, is a sort of little comedy or operette all by itself, and requires a new plot and an unusually high pitch of interest. The finale, chiefly, must glow with the genius of the conductor, the power of the voices, the grandest dramatic effects. Recitative is banned from the finale: everybody sings; and every form of singing must be available—the adagio, the allegro, the andante, the intimate, the harmonious and then—noise, noise, noise; for the finale almost always closes in an uproar: which, in musical jargon, is called the *chiusa*, or rather the *stretta*, I know not whether because, in it, the whole power of the drama is drawn or "pinched" together, or because it gives generally not one pinch but a hundred to the poor brain of the poet who must supply the words. The finale must, through a dogma of the theatre, produce on the stage every singer of the cast, be there three hundred of them, and whether by ones, by twos, by threes or by sixes, tens or sixties; and they must have solos, duets, terzets, sextets, thirteenets, sixtyets; and if the plot of the drama does not permit, the poet must find a way to make it permit, in the face of reason, good sense, Aristotle, and all the powers of heaven or earth; and if then the finale happens to go badly, so much the worse for him!'

*giardiniera* as a chain finale because it covers 530 bars in ten sections and employs multiple changes in key, tempo and metre. However, it is generally not afforded such status in reception. In 1782, Mozart looks again to an extended ensemble to finish an act in *Die Entführung aus dem Serail*, this time not even employing the term 'finale', with 367 bars in eight sections bringing the second act to an end. The emphasis and role of the end of a central act was clearly something Mozart felt strongly about as a core element in the dramatic narrative. Da Ponte's new 'formula' may well have played a crucial role in the sense that, for the first time, Mozart was presented with a libretto which facilitated his ambitions. Now much loved and revered, this was a successful collaboration from the outset. As Miller suggests, both parties set out to consciously challenge the norm, building on their respective experiences (da Ponte in his recent *Il burbero* and Mozart in some of his previous operas). The comment below, taken from the original libretto, demonstrates both their joint ambition to produce something new and their conviction that they had achieved this:

> In spite, however, of every effort, and of all the diligence and care taken by the composer and by myself to be brief, the opera will not be one of the shortest to have appeared on our stage, for which we hope sufficient excuse will be found in the variety of the threads from which the action of this play is woven, the vastness and grandeur of the same, the multiplicity of the musical numbers that had to be made in order not to leave the actors too long unemployed, to diminish the vexation and monotony of long recitatives, and to express with varied colors the various emotions that occur, but above all in our desire to offer as it were a new kind of spectacle [*un quasi nuovo genere di spettacolo*] to a public of such refined taste and such judicious understanding.[11]

### 1.5 — Mozart and music theory

Given the considerable amount of surviving correspondence of the Mozart family, it is surprising how little one gleans with regards to tempo in performance. In a letter written in October 1777, just before leaving Augsburg for Mannheim, Mozart relays to Leopold his annoyance at Herr Stein's daughter who, though she had talent, had no grasp of the beat.[12] An interesting aspect of this letter comes in his description of tempo as 'the most necessary,

11 Transl. in Miller, "'*Un quasi nuovo generi di spettacolo* ...'. Beaumarchais', Da Ponte's, and Mozart's *Folle journée*', 7. Original available as part of the DME Libretti Edition <http://dme.mozarteum.at/DME/libretti-edition/wrkliste.php?sec=libedi&l=2> Accessed 27 September 2017

12 Bauer, Wilhelm A., Otto Erich Deutsch, Joseph Heinz Eibl (eds.), *Mozart: Briefe und Aufzeichnungen, Gesamtausgabe*: volume 2, 83 (hereafter MBA)

the most difficult, the most important thing in music', which sets out a very clear stance on the importance of tempo in performance. The most immediate conclusion from this passing statement is that Mozart is referring to an ability—or lack of, in this case—to keep a strict tempo. One would expect such an obvious sentiment from most musicians, whether they be Mozart or Miles Davis: the ability to keep time is essential in music-making. As obvious as the notion may be, however, this letter also presents the possibility that matters of tempo in performance are a major element in Mozart's stylistic environment. It is reasonable, then, to suggest that the process of establishing a tempo would therefore be of equal (or possibly greater) difficulty and importance to Mozart as maintaining it.

Although there is no written correspondence on such processes of establishing tempo in the Mozart family letters, there are occasional references to music theorists who have written on the matter. In his letter of 11 June 1778, Leopold asks his wife and son to send a French translation of his *Violinschule* from Paris. He also refers to a new treatise by Vogler, which he has already ordered, saying that he expects it to be a 'boiled down' system based on a number of existing treatises concerning both theory and practice.[13]

Leopold clearly maintained an active interest in the publication of practical and theoretical treatises, and in the art of education in music in general. This is demonstrated by the second edition of his own *Violinschule*, in which Leopold includes a number of sources which had come about since the first edition (most notably Marpurg's *Historisch-Kritische Beytrage zur Aufnahme der Music* III of 1759).[14] It is also evident in his desire to be learned about current teachings, in this case through obtaining Vogler's *Kurpfälzische Tonschule*, which the government of Palatine had recently prescribed for use by all *clavier* teachers in the art of both singing and composition.[15] Unsurprisingly, Leopold exhibits a value on these publications, indicating that treatises (both theoretical and practical) have the potential to be genuinely useful tools for both the learner and the teacher. Leopold even recommends Wolfgang to get hold of Vogler's latest treatise and adopt it in his teaching practice in Paris. At surface level, it seems the young Mozart does not take such an active interest as Leopold.

13 Ibid. 374
14 Mozart, *Grundliche Violinschule,* 50
15 MBA vol. 2, 374

Mozart's letters are primarily concerned with his own activities, though on occasion he does share opinions about his colleagues and rivals. Mozart saw Vogler, for example, as 'a fool' whose *Tonwissenschaft und Tonsezkunst* is 'better for teaching arithmetic than for teaching composition'.[16] Where Mozart's correspondence leaves behind a limited view of his interest in contemporary practices, we are fortunate to be able to assess this possibility through the substantial number of sketches still extant today.

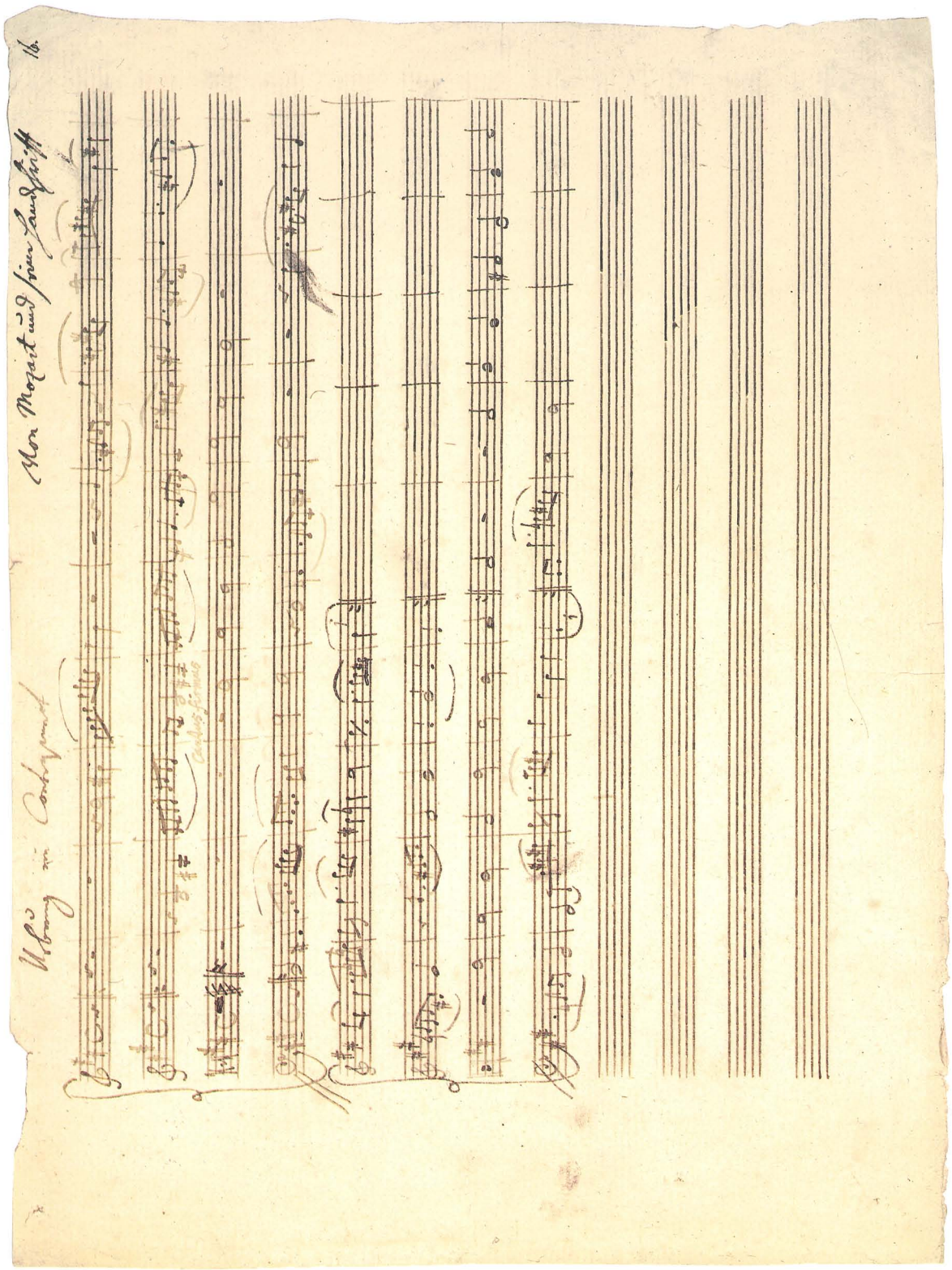
It is well known that, through his association with Baron van Swieten in 1782, Mozart was able to familiarise himself more closely with the music of J. S. Bach and Händel. It is a generally accepted part of the narrative of Mozart's life that during his early years in Vienna the exposure to van Swieten's library enabled him to further his knowledge and, as a result, develop and hone certain skills and styles. In short, Mozart's encounters with the works of these composers prompted curiosity and provided inspiration. But how might Mozart have acted on this? Turning to treatises may have been one outcome.

In the article 'Mozart, Kirnberger and the Idea of Musical Purity', Marcus Rathey delineates the possibility that Mozart turned to Kirnberger's treatise *Die Kunst des reinen Satzes* as a source of education in counterpoint.[17] Though this article is primarily concerned with Mozart's use of the Lutheran hymn 'Ach Gott, vom Himmel sieh darein' in *Die Zauberflöte*, it also addresses a selection of sketch leaves from 1782, the same year Mozart began his association with van Swieten. Whilst acknowledging that Mozart may have encountered this chorale melody through a number of other sources, Rathey makes the highly convincing case that he knew Kirnberger's treatise. A number of sketch leaves from 1782 point towards this possibility. First, there is an exercise in counterpoint in which the chorale melody appears as a *cantus firmus* (see example 1), which bears a striking resemblance to a number of Kirnberger's examples. Second, Mozart sketches a solution to the riddle canon printed on the title page of the 1771 edition of *Die Kunst* (see examples 2a and b).[18] According to Rathey the only alternative source of this canon could have been

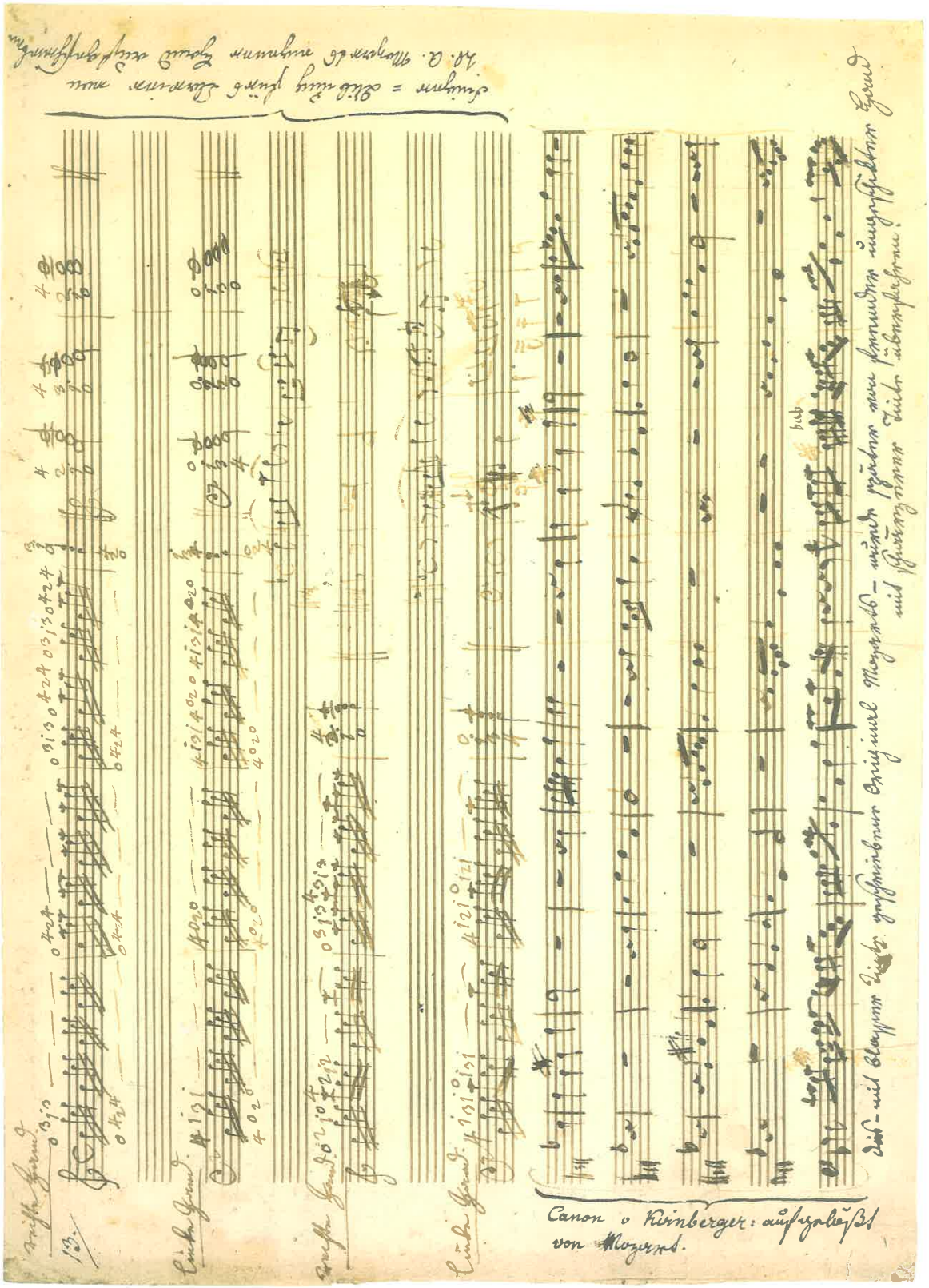
16 Ibid. 119

17 Rathey, 'Mozart, Kirnberger and the Idea of Musical Purity: Revisiting Two Sketches from 1782', 235–252

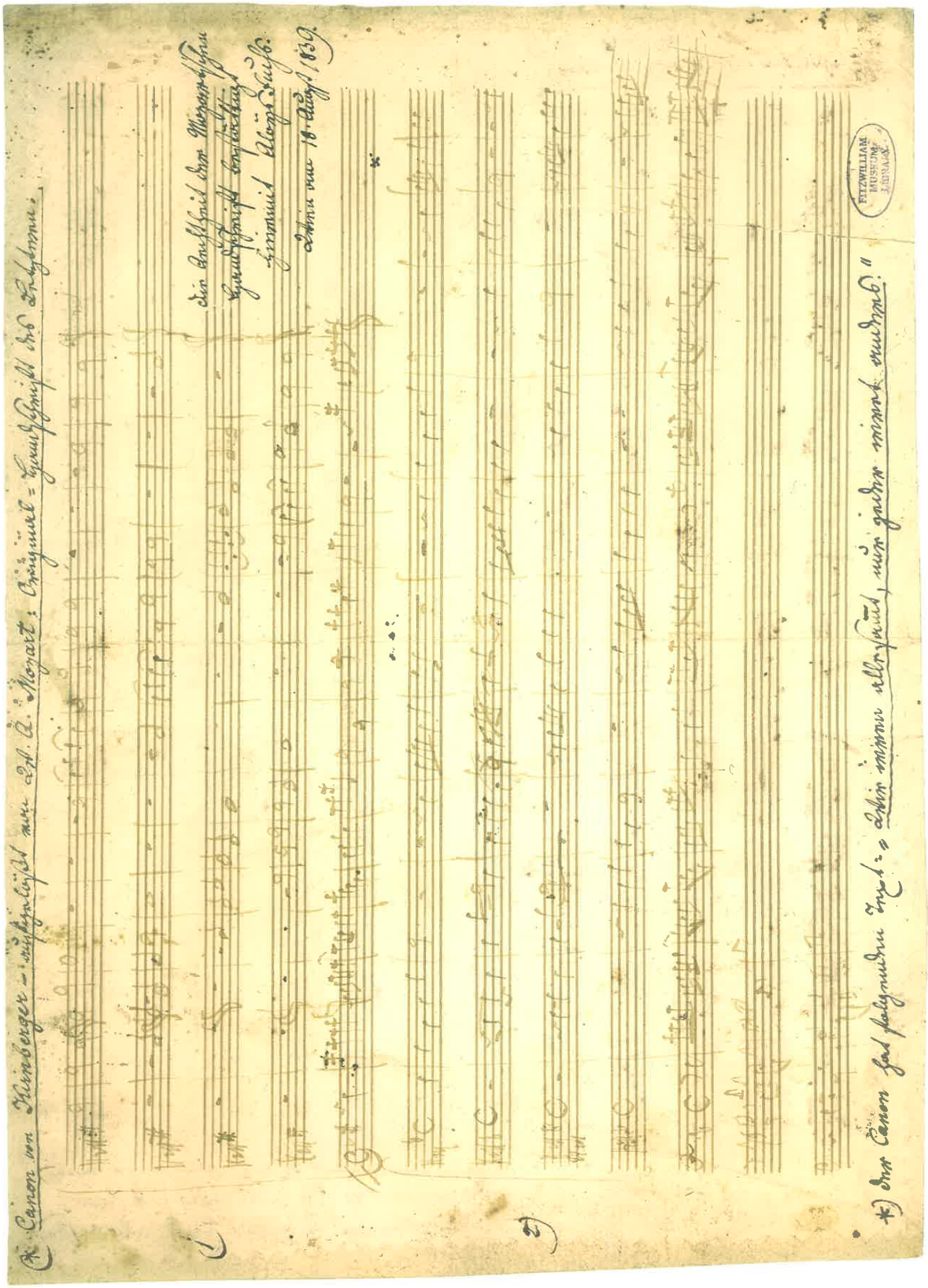
18 Skizzen, NMA X/30/3, 35 recto, 29 recto and verso



**Example 1**: Skb 1782g recto




**Example 2a**: Skb 1782a recto




**Example 2b**: Skb 1782a verso

Vogler's *Betrachtungen der Mannheim Tonschule*.[19] Rathey quickly dismisses the possibility of Mozart encountering this through Vogler on the grounds that the chorale melody is not featured in this treatise. He also adds that with such hostility between the two it would be unlikely that Mozart would turn to Vogler for his own education.[20] Likely as this may be, it is still possible that Mozart discovered the riddle canon through Vogler.

In his exhaustive PhD thesis, *The Mozart Family and* Empfindsamkeit*: Enlightenment and Sensibility in Salzburg 1750–1790*, Viktor Töpelmann amasses a detailed overview of the intellectual environment in which the Mozart family were situated. Amongst other things, Töpelmann's findings demonstrate the various means through which certain literature came into the family's possession or awareness. Despite Rathey's hypothesis, Kirnberger's *Die Kunst* does not feature in Töpelmann's findings, nor does Vogler's *Betrachtungen*.[21] Thus, there is a disconnect between Rathey's and Töpelmann's assessments of the sources Mozart may have engaged with. This demonstrates how challenging it is to ascertain Mozart's influences and interests in music theory.

One of the only volumes in the Mozarts' possession which dealt specifically with tempo was Giovenale Sacchi's *Della divisione del tempo nella musica nel ballo e nella poesia*, which is now extant in the Special Collections department of the University of Glasgow.[22] One can imagine the excitement of discovering a book on the subject relating to that of this thesis and which bears the Mozart signature. However, the content of this book is much less illuminating than one would hope. The bulk of it is concerned with text and does not go into any particular depth with regards to tempo and metre theory, essentially just redressing what Mattheson had written on tactus in 1739. It is possible that the primary reason the Mozarts owned a copy is not so much for its content as because Wolfgang's already famous talent is actually mentioned briefly, a detail which appears to have been overlooked in musings about this volume up until now. Further reflections on the Mozarts' ownership of this publication are presented in appendix 1.

19 Rathey, 'Mozart, Kirnberger and the Idea of Musical Purity: Revisiting Two Sketches from 1782', 244
20 Ibid.
21 Töpelmann, *The Mozart Family and* Empfindsamkeit*,* Appendix 1, 293–97
22 See Deutsch, *Mozart: A Documentary Biography*, 604; Töpelmann, *The Mozart Family and* Empfindsamkeit, 120; and University of Glasgow Sp Coll F.c.26

As has been demonstrated, there are not many leads to follow investigating tempo in Mozart's world. Pragmatic decisions influenced the formation of the theoretical backdrop to this study of *Figaro* which will utilise three treatises in particular: Quantz's *Versuch einer Anweisung die Flöte traversiere zu spielen*, *Die Kunst des reinen Satzes in der Musik* by Kirnberger, and Koch's *Versuch einer Anleitung zur Composition*. All of these share a principal emphasis on music-making in German speaking territories, where Mozart was based: first in Salzburg then in Vienna. They also represent a progression through the second half of the eighteenth century, with Quantz's *Versuch* dating from 1752 right up to Koch's *Versuch* in 1793 – a period spanning the duration of Mozart's life. More specifically, these three treatises offer contrasting and complementary qualities. Quantz offers the performer's perspective, one which Leopold seemingly valued.[23] Furthermore, his overview of using the human pulse to establish tempo provides an insight which is not documented in such great detail in any other eighteenth-century text. Kirnberger's *Die Kunst* draws heavily on the concept of *tempo giusto*, focusing more on the metric qualities set out in the composer's chosen notation and how they influence a certain feel and emphasis. As outlined earlier in this chapter, it is highly likely that Mozart was actively engaged with Kirnberger's theoretical writings. Finally, Koch's *Versuch* marks the ushering in of a more modern approach to metre, which may or may not explain why the tempo indications of the *Figaro* acts II and IV finales in particular are so challenging to interpret.

23 See MBA vol. 8, 48 where Leopold's letter to Spiess notes that he would be surprised if his own *Violonschule* lived up to the expectations following Quantz's *Versuch* and C. P. E. Bach's *Versuch*.

# Tempo, metre and rhythm in the finales of *Le nozze di Figaro*

Key treatises pertaining to eighteenth-century composition, music theory or performance practice form the starting point from which Mozart's tempo indications are assessed in this chapter. As shown in the introduction (and extensively by Viktor Töpelmann in his doctoral thesis), it is clear that Wolfgang and Leopold had an active interest in the treatises of notable contemporary composers, performers and music theorists.[1] Two treatises stand out for their insights to practices and theories on tempo and metre in the late 1700s: *Versuch einer Anweisung die Flöte traversiere zu spielen* of 1752 by Johann Joachim Quantz (1697–1773) and *Die Kunst des reinen Satzes in der Musik* of 1771–79 by Johann Philipp Kirnberger (1721–1783). This chapter will explore these two treatises in depth and speculate on how they relate to the chain finales from *Le nozze di Figaro*, offering possible starting points for performance. Following an overview of every tempo indication and metre combination in the finales of acts II and IV, similarities between Mozart's use of metre and the theory put forth by Heinrich Christoph Koch (1749–1816) in his *Versuch einer Anleitung zur Composition* of 1782–93 will be considered. This chapter will then explore how Mozart's attitude to tempo and metre may have drawn from each of these theories, representing a much more intricate and cultivated, and therefore distinct, approach than one might initially expect.

## 2.1 — Established eighteenth-century perspectives

General investigation into eighteenth-century theories on what we today broadly define as 'tempo' is governed by three discrete elements: tempo, metre and rhythm. The importance of this trilogy is hardly understated by Kirnberger:

> A succession of notes that mean nothing by themselves and are differentiated from one another only by pitch can be transformed into a real melody—one that has a definite character and depicts a passion or a particular sentiment—by means of tempo, metre and rhythm, which give the melody its character and expression. […] But it must be kept in mind that none of these elements is sufficient by itself to give

1 See pages 15–22 and Töpelmann, *The Mozart Family and* Empfindsamkeit, 115–26

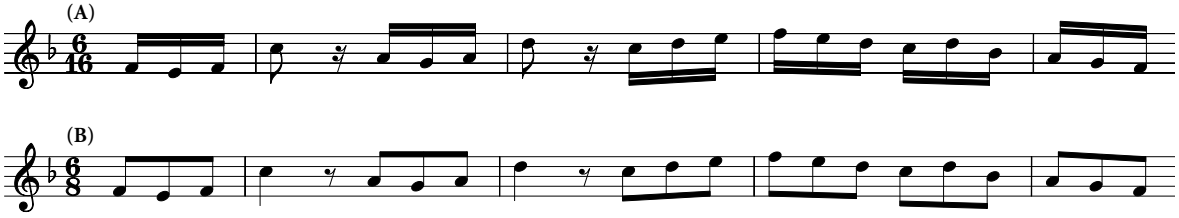
> the melody a precise character; the true expression of the melody is determined only by their synthesis and their interaction.[2]

As Kirnberger's *Die Kunst* was written primarily for the benefit of aspiring student composers it represents a useful insight into notational practices of its day. In particular, the concept of *tempo giusto* is central to Kirnberger's theory, demonstrating how certain notational decisions might imply a type of tempo and feel in performance. From the outset, he makes the case that it is the responsibility of the composer to truly notate their intentions, suggesting that one 'must have acquired a correct feeling for the natural tempo of every metre' and that one ought to have thoroughly studied the 'nature of every passion and sentiment' in order to achieve this.[3] To a twenty-first-century musician, this concept of *tempo giusto* does not come without its difficulties. That the performer should be able to glean the 'right' tempo and feel from the metre and rhythm notated alone implies a very specific and universal notational understanding between composer and performer which one could argue has now been lost or indeed existed only as Kirnberger's 'ideal' in the absence of a Platonist view of a composer's text. In many cases music from the eighteenth-century comes without any form of tempo indication at all. Kirnberger encourages the aspiring composer to introduce adjectives (Adagio, Allegro, etc) only once they fully understand that *tempo giusto* is derived from both the metre and the larger and smaller note values in a movement. Essentially, Kirnberger equips the reader with the vocabulary and grammar of the current notational practices. This linguistic analogy is well suited as he regularly refers to characteristics of speech and the role of the poet or orator as examples of natural rhythm and metre. It is clear that one of Kirnberger's primary aims is to educate the aspiring composer in such a way that their intentions are 'captured quickly and correctly by the performers'. This in itself sets *Die Kunst des reinen Satzes* aside from the writings of Quantz (and others, such as C. P. E. Bach), which is more concerned with the role of the performer's practice, and will be explored in due course. Though it is not the aim of this chapter to enter into a point-by-point dissection of Kirnberger's text on tempo, metre and rhythm, it will be beneficial to summarise a number of his key points before subjecting

2 Kirnberger, *The Art of Strict Musical Composition*, 375–376 (hereafter Kirnberger, *Die Kunst*)
3 Ibid. 376

the finales from Mozart's *Le nozze di Figaro* to cross-examination with what we know of eighteenth-century practices.

Kirnberger states that in hearing a succession of equal pulses repeated at regular intervals, we immediately divide them metrically in our minds by arranging them into equal groups. We divide these into groups of two, three or four because 'we do not arrive at any other division in a natural way'.[4] By applying beats instead of pulses, bars instead of groups and then imposing a hierarchy, Kirnberger suggests that it could be assumed that one might only require three time signatures; one metre indicating a bar of two, another indicating a bar of three, and a final one indicating a bar of four.[5] This is where choice of metre corresponds with the concept of *tempo giusto*: different time signatures imply different tempos. Kirnberger illustrates this by notating the subject from the F major fugue in book two of J. S. Bach's *Das wohltemperierte Klavier* both in quavers and semiquavers (see example 3). In the latter (B) 'the gait is much more ponderous', and it encourages a heavier, possibly slower, tempo and feel. Furthermore, Kirnberger notes that it impacts on the way one stresses the harmonic rhythm by placing too much emphasis on the passing notes. In the former (A), the notes are 'to be performed lightly and without the least pressure in a fast tempo'.[6] The effect demonstrated here is emblematic of Kirnberger's general thesis: metres with larger note values indicate slower tempos and heavier styles, while those with smaller note values indicate quicker tempos and a lighter feel, and the differences may be observed in the harmonic rhythm.




**Example 3**: Bach's F major fugue from *Das wohltemperierte Klavier* Teil II. Taken from Kirnberger's *Die Kunst* page 388

Kirnberger is clear which time signatures fall within his approved vocabulary and in what capacity. Although stating that 'it is not possible to give definite rules that would

4 Ibid. 383
5 Ibid. 384
6 Ibid. 388

specify the most suitable tempo and metre for every type of sentiment',[7] Kirnberger certainly comes close to this by categorising time signatures with specific functions and qualities in mood and character. He presents a series of observations about simple even metres of two and four beats, odd metres of three beats and compound metres. Certain metres are also documented as no longer being in use.

Once again we are reminded of the importance placed on the legibility of the score for the performer, as Kirnberger notes which time signatures are to be avoided, primarily because they are difficult to read. In place of the large *alla breve* metres like 2/1 and 6/2, it is recommended to use 2/2 and 6/4 with the adjective *grave*, thus indicating the 'emphatic' and weighty performance. Similarly, instead of 4/2, Kirnberger suggests a 'large' 4/4 or 12/8 time denoted once again with the adjective *grave*. The same is recommended for the odd metres in three. By 'capping' so-called large metres within a more common array of time signatures the vocabulary becomes somewhat limited. It is through pivotal characteristics that the performer discerns what an appropriate *tempo giusto* might be. Beyond these 'large' metres and their required indication of *grave*, the range of note values typically affects the *tempo giusto* of a given metre. This is heavily influenced by various dance forms. Kirnberger uses the *sarabande* and the minuet as an example: both have a 3/4 time signature but the *sarabande* is slower because it typically features semiquaver (or even demisemiquaver) note values. The quickest note value in a minuet is typically a quaver as 'it does not tolerate many sixteenth notes […] in succession'.[8] Interestingly, however, Kirnberger's use of dance forms as a guide seems only to apply to odd metres. Even metres in two and four are generally given descriptions such as 'lively', 'emphatic', 'stately', 'playful', 'serious', etc, but are not paired with a particular dance form. Volume 1 of *Die Kunst des reinen Satzes*, which appeared in 1774 features a chapter on 'Embellished or Florid Simple Counterpoint' in which Kirnberger briefly states that:

> fast compositions in 4/4 time, as it appears in the *bourrée* or a *gavotte*, do not easily tolerate notes smaller than eighth notes. The same metre, but in a slow tempo, as it

7 Ibid. 382
8 Ibid. 396

> usually appears in *overtures* and *entrées*, tolerates sixteenth and even thirty-second notes.[9]

Clearly dance forms are a critical part of Kirnberger's theory as he intended to write an entire chapter on the matter. This makes their omission in relation to even metres rather peculiar. It may be the case that he provides more information regarding odd metres because a time signature such as 3/4 has the ability to serve a wider range of stylistic functions. As Kirnberger says of 3/4 metre: 'since it assumes all degrees of tempo […], all note values that fit this tempo can be used, depending on the rate of speed'.[10] This may not be so much the case for simple even metres because their uses are more limited in application: 2/2, 2/4, and 4/4 time each have a distinctive feel and role in Kirnberger's theory.

Taking 4/4 as an example, it is first noted that one should differentiate between 'large' and 'small' 4/4 not only with the word *grave* but by notating the former in 4/4 and the latter in common time (𝐂). The smallest note values in large 4/4 are quavers and its application is typically confined to church music, choruses and fugues; there is a clear and established style to which large 4/4 is well suited. In contrast, small 4/4 time is 'used very often in all styles'. It is livelier and lighter than large 4/4 and the range of note values extends to semiquavers. As Kirnberger makes very clear 'the two metres have nothing in common except for their time signatures'.[11] This particular distinction does not seem to be common to other treatises.

In addition to providing insight into the characteristics associated with certain metres, it can be said that Kirnberger's account considers spacial context and surroundings too; large metres are better matched to slow or moderate tempos which are best suited to a church acoustic. This is certainly the case with the differences outlined between large and small 4/4 time. Kirnberger also states that 'because of its lighter execution, 3/4 metre is not as common in the church style as 3/2; but it is used very often in the chamber and theatrical styles'.[12] In essence, music composed for a more immediate setting benefits from a 'lighter' vocabulary while music

9 Ibid. 216
10 Ibid. 396
11 Ibid. 390–391
12 Ibid. 396

written for a less focussed acoustic requires more time, weight and space. From this we can state that the concept of *tempo giusto* extends not only to the style of composition, whether it be influenced by dance or not, but also to the potential surroundings of the performance.

There are numerous differences between Kirnberger's school of tempo and that of Quantz. Where Kirnberger relies on the reader's sensitivity by imparting definitions through a particular style or fashion, Quantz sets out a more regulative and—to a certain extent—measured method, in which the 'pulse at the hand of a healthy person' forms the basis for his central thesis.[13] The use of the human pulse in music theory extends back as far as the fourteenth century, stemming from medical studies of the pulse and its rhythm dating from as early as 335 BC and which rely heavily on rhythmic measurements.[14] Despite this, Quantz's method has been disregarded in recent literature regarding Mozart's tempo indications.[15]

Quantz acknowledges that he is not the first to use this system but it is likely it has not been documented in such detailed fashion before his *Versuch*. In 1739 Mattheson likens tempo and metre to the human heart and body, demonstrating that the links forged in fourteenth- and fifteenth-century music theory were still present in early eighteenth-century theory:

> The principal character of the mensuration is established once and for all on the fact that each mensuration, each segment of the time-measure, has only two parts and no more. These have their source or their basis in the arteries, whose pulsations and relaxations are called *systole* and *diastole* by experts in medicine.
>
> Musicians as well as poets have taken such qualities of the body as a model, and arranged the time-measures of their melodies and verses accordingly, but they have called the ebb and flow in the beat *thesis* and *arsis*.[16]

13 Quantz, *On playing the Flute*, 283 (hereafter Quantz, *Versuch*)

14 For a thorough overview of the emergence of pulse studies in medicine and their eventual transference to music theory, see Guariento, *From Monochord to Weather-glass:* musica speculativa *and its development in Robert Fludd's Philosophy*, PhD thesis, University of Glasgow, 2014, 256–291

15 See page 9, Introduction – State of the field

16 Mattheson, *Der vollkommene Capellmeister*, 365

Quantz proposes that there are four categories of tempo: Allegro assai, Allegretto, Adagio cantabile and Adagio assai. He suggests that all tempo markings fit within one of these four categories and that 'if the […] four principal categories are clearly grasped, the tempos of others can be learned more easily, since the differences are slight'.[17] In common time, Allegro assai will have one pulse beat per minim, Allegretto one pulse beat per crochet, Adagio cantabile one pulse beat per quaver and Adagio assai one pulse beat per semiquaver.[18] Quantz, like Kirnberger, makes clear the importance of the chosen metre and smaller note value, which he regularly refers to as 'passage work'. It is significant, though hardly surprising, that these three elements are common to both approaches; the key differences are how they are prioritised. Quantz looks first to the tempo indications, then to the metre and note value of the passage work; Kirnberger—as mentioned above—feels that one should employ detailed tempo indications only when tempo cannot be determined from the metre and rhythm.[19] This difference may be a by-product of the fact that one method is written more for the benefit of the performer, the other more for that of the composer. In general, however, differences between the two are not so great. As an example, Quantz notes that in a 3/4 piece in which only quavers occur, the piece is in the faster tempo, while a 3/4 piece which features semiquavers will be in the more moderate tempo,[20] essentially demonstrating the same point as Kirnberger's illustration between the *sarabande* and the minuet. At the faster end of the spectrum, Quantz stipulates that no more than eight very fast notes can be executed in the time of a pulse beat. He also indicates that there is a tempo between Allegro assai and Allegretto which can be found through the mean. This features frequently in vocal pieces and can be indicated by the adjectives Poco allegro, Vivace or just Allegro.[21] With this, one can derive five clearly discernible strands of possible tempo, as seen in table 1.

17 Quantz, *Versuch*, 284
18 Ibid. 286
19 Kirnberger, *Die Kunst*, 381
20 Quantz, *Versuch,* 285
21 Ibid. 286

| CATEGORY | SELECT TEMPO INDICATIONS | PULSE | MODERN-DAY BPM |
|---|---|---|---|
| **Allegro assai** | Allegro assai, Allegro di molto, Presto | 1 per 𝅗𝅥 | 𝅗𝅥 = 72 |
| **Allegro** | Allegro, Poco Allegro, Vivace | 1 per ♩. | ♩ = 108 |
| **Allegretto** | Allegro ma non tanto, Allegro non troppo, Allegro moderato | 1 per ♩ | ♩ = 72 |
| **Adagio cantabile** | Cantabile, Larghetto, | 1 per ♪ | ♪ = 72 |
| **Adagio assai** | Lento, Grave, Mesto, Largo assai | 1 per 𝅘𝅥𝅯 | 𝅘𝅥𝅯 = 72 |

**Table 1**: Quantz's pulse tempo system, using my own pulse

As illustrated in table 1 there is something of a 'void' between Allegretto and Adagio cantabile. This is potentially the biggest flaw in Quantz's system. With the exception of the aforementioned 'moderate Allegro' (not to be confused with Allegro moderato, in the Allegretto category), tempos are either doubled or halved, thus it is not clear how moderate tempos might fit within this system. Quantz's lack of commentary on the Andante tempo indication is particularly noteworthy and is unsubstantial at best. For anybody unfamiliar with Mozart's work, it would not take them long to discover how frequently the Andante tempo indication features. Taking Quantz's 'moderate Allegro', one could address this by establishing a midway mean tempo between Allegretto and Adagio cantabile as proposed by Ian Cook. This yields a new category which is better suited to Andante, while remaining within ratios of the pulse beat.[22]

How then does one apply Quantz's use of the human pulse in practice? As already mentioned, there are criticisms and doubts that this is a suitable method to establish tempo. Quantz anticipates the primary objections to the pulse varying due to time of day, from one day to another, and from person to person. He combats this by suggesting 80 beats per minute as the standard human pulse of a healthy person. Though plenty of our current secondary source literature examining Quantz's theory use this as their marker, it seems wholly appropriate to use my own pulse beat to set out the various different tempo categories. This was, after all, how Quantz intended this system be used.

22 Cook, *Analytical Study*, 88

Taking an average of my pulse across a few hours it typically beats 72 times per minute. Through Quantz's method, this yields a fastest tempo (Allegro assai) at 72 minims per minute, a 'moderate' Allegro of 108 crotchets per minute, 72 Allegretto crochets per minute and 72 quavers and semiquavers in Adagio cantabile and Adagio assai respectively, as can be seen in table 1. If one were to adopt Cook's idea, one could have an Andante with 54 crotchets per minute. With five grades of tempo—or six if Cook's Andante is included—a system is established from which one can extract starting points in relation to the individual sections of the acts II and IV finales in *Figaro*. The following will briefly outline the qualities of each section and summarise their possible relations to the theories put forth by Quantz and Kirnberger.

### 2.2 — The finale of Act II

The finale of Act II from *Le nozze di Figaro* consists of ten sections across 939 bars. Chapter 3 gives particular consideration to evidence that in the 1786 Vienna production of this opera the fifth section may have been cut ('Conoscete signor Figaro' at bar 398). As this chapter pays particular regard to the individual sections, this section will be included.

In conducting a study of these section changes in relation to contemporary theories, the issue of how 'true' one should remain to the theory is raised. Should the theory govern the musical realisation, or should it be taken at a more conceptual level: informing the result rather than prescribing it? This is not a new question to the field of musicology—and indeed to many performers, particularly those of the historically informed variety—but is a useful regulative marker in the context of this study. As this thesis compares a number of theories on tempo, metre and rhythm and how they relate specifically to these finales, such departure from 'absolutes' is unavoidable as there are naturally contradictions between the theories of Quantz, Kirnberger, and any other eighteenth-century music theorist one would care to include. Similarly, there are substantial areas in which one provides more insight than the other. In particular, it is worth reminding the reader that Kirnberger offers much more information on odd metres than even, while Quantz's method is more naturally conducive to even metres because it is based upon 1:2 ratio relationships across his four categories. As a result, one treatise may receive more focus than the other in certain

sections. The principal aim of this exercise is to draw tangible options out of these theories, in combination or in isolation, and—where appropriate—by extension.

### **2.2.1 — Section One: Allegro** [bb. 1–125]

This section fits exactly the conditions set out by Quantz for the moderate Allegro: it is in common time, it is a vocal piece, and it is indicated only as Allegro. With four beats each bar, 108 crochets per minute establishes a possible opening tempo which caters for the quaver passage-work. As noted earlier, this is what Kirnberger calls 'small' 4/4, which allows a more lively tempo and lighter execution.[23] Kirnberger's small 4/4 can include semiquavers, so their absence in this context could suggest a marginally quicker tempo than Quantz's method indicates. The merits of taking Quantz's more moderate approach are that, with a further six sections in an Allegro tempo or faster still to come in the finale, there is greater scope to increase the tempo as the drama heightens towards the end of the act.

As Cook's survey of recordings from across the last seventy years indicates, almost everybody performs this opening in a fast two.[24] This gives the opening of the finale a much more frantic quality, and certainly makes the Count's and Countess's parts much more formidable. Possible reasons behind this will be explored upon the introduction of Koch's *Versuch* later in this chapter.

### **2.2.2 — Section Two: Molto andante** [bb. 126–166]

This Molto andante is perhaps the most challenging section for which to suggest a tempo. In keeping with both Kirnberger's and Quantz's mantras, the chosen tempo will greatly depend on the type of character one wants to adopt. As such, the generalised categories suggested by Quantz and Kirnberger are quite different. Within Quantz's theory, Andante is posited within the Adagio cantabile grade (around 72 quavers per minute).[25] In addition, the presence of semiquavers and triplet semiquavers could imply a more relaxing and leisurely feel. Kirnberger describes the 3/8 metre as a light 'but not entirely playful'

23 Kirnberger, *Die Kunst*, 391
24 Cook, *Analytical Study*, 396
25 Quantz, *Versuch*, 287

metre, used more regularly in chamber and theatrical music.[26] He notes that triple metres have a common element: their beats are felt per bar and the accents, being a light metre, will fall only on the first beat.[27]

An additional challenge with this section is the indication 'molto andante', which has become an ambiguous instruction: for some it indicates a quicker andante, for others it indicates a slower one.[28] A useful piece of information, filtered out through the editorial processes, lies in Mozart's manuscript where, at the top of the score, he writes Molto andante but at the bottom he writes Andante di molto. The describing adjectives can both precede and follow a tempo indication but the latter configuration is typically not seen in the context of slower markings. Allegro di molto is frequently employed, however Adagio di molto is less so. This could indicate that Mozart opted for the wording 'Molto andante' in order to discourage a quicker interpretation, as may be the result of Andante di molto. Alternatively, one could bracket them together as the same modifier, which trends towards a quicker tempo than the standard Andante. Considering this, in addition to Kirnberger's notions of a lighter metre, one can interpret a one-in-a-bar feel. Bearing in mind that there is an Allegro 3/8 a little further into the finale, Cook's Andante (54 pulse beats per minute) may be the most suitable choice for this section.

**2.2.3 — Section Three: Allegro** [bb. 167–327]

The conditions found at the beginning of the finale are reinstated here, as if framing section two. The Allegro tempo is not given any further definition, and the common time and quaver passage work leans toward the moderate tempo of around 108 crotchets per minute, taking Quantz's method again. Returning to the opening tempo would make sense both dramatically and within the narrative. As argued by Harnoncourt, Mozart is known to have altered tempo indications in order to suggest similarities or differences across symphonies.[29] In section one, Almaviva and the Countess open the finale's proceedings with their

26 Kirnberger, *Die Kunst*, 397
27 Ibid. 398
28 Fallows, 'Andante', Grove Music Online
29 Harnoncourt, *The Musical Dialogue*, 92–99

argument, with the Count in a rage and threatening death to Cherubino. Upon opening the dressing room, Susanna steps out and confuses both the Count and the Countess in section two. After double checking the dressing room, the Count returns to the argument in section three; he brings the focus back to the preceding feud, this time from an apologetic stance. Returning to the opening tempo reflects this aspect of the drama's discourse and treats the central Molto andante as a sort of pause in their argument.

**2.2.4 — Section Four: Allegro** [bb. 328–397]

The proposed theories for Allegro 3/8 are much closer between Quantz and Kirnberger than in the case of the Molto andante 3/8. The beat will be one-in-a-bar and this Allegro would be much more appropriate to be 72 beats per minute, therefore fitting within Quantz's system but contrasting with the second section heard earlier (54 bars per minute). This allows for the lively 'frolicsome' nature which Kirnberger refers to.[30] In general, this section employs just quavers (particularly with regards to passage-work), though the proposed tempo also accommodates the single occasion of repeated semiquaver notes in bars 347–354, in addition to the written out ornaments and scalic runs which bring contrast to Figaro's overexcited entry to the finale.

**2.2.5 — Section Five: Andante** [bb. 398–466]

The same pulse beat carries over to this fifth section, though the bar has two pulse beats rather than the one in 3/8. The demisemiquaver passage-work indicates that this 2/4 metre is both light and moderate in tempo; not quick but with a forward motion. It is the juxtaposition of a 2/4 metre with an Andante tempo indication which once again highlights the challenges already encountered in the Molto andante; Quantz's notion of Andante as slow does not easily coexist with Kirnberger's 'light' and 'lively' metre. Similar to the 3/8 Molto andante, Mozart combines metres which are typically quick with tempo indications which might be seen as slower. We might deduce from this that Mozart was deliberately combating a slower notion of Andante with metres which tended towards quicker impli-

30 Kirnberger, *Die Kunst*, 400

cations, possibly in the hope that their combination will imbue a specific feel. According to Quantz's method, this Andante section would be performed at a very slow rate of 72 quavers per minute.[31] However, similar to Kirnberger's notion of 2/4 as a lively metre, Quantz separately suggests one pulse beat per bar for 2/4 and 6/8.[32] As has already been outlined, the presence of smaller note values suggest a slower grade of tempo—a rule which is common both to Quantz's and Kirnberger's theories—so the demisemiquavers of this Andante section rule out the possibility of a one-in-a-bar pulse. The midway point between 72 quavers per minute and 72 minims per minute is 72 crochets per minute, which accommodates both the demisemiquavers and the lighter feel.

**2.2.6 — Section Six: Allegro molto** [bb. 467–604]

This Allegro molto shifts the finale into the fastest of Quantz's four categories for the first time. Quantz advises one minim per pulse beat. With quaver passage-work in the strings, a quicker tempo can be accommodated (whereas semiquavers might imply a slower approach). A tempo of 72 minim pulse beats per minute allows for a logical but substantial 'change of gear', marking the beginning of the second half of the finale, from which point the tempo and drama both become quicker and more frantic.

**2.2.7 — Section Seven: Andante** [bb. 605–696]

Interrupting this new found energy, this section reinstates Andante for the final time in this finale. Figaro, unconvincingly making the case that it was he who jumped from the balcony, is caught out as Antonio sings 'Vostre dunque saran queste carte che perdeste?' ('So these are your letters. What did you lose?'). Mozart's return to Andante is effective here, leaving an uncomfortable tension in the air between Susanna, the Countess and Figaro and their foes, the Count and Antonio. As this section is so dramatically static, essentially a stand-off, Cook's Andante tempo of 54 dotted crotchets per minute is well matched to the circumstances. It also suits the orchestral writing, with quaver movement in the strings and

31 Quantz, *Versuch*, 286
32 Ibid.

held pedal notes in the winds; 72 quavers per minute would be far too slow, while 72 dotted crotchets per minute would lose the stagnant effect.

**2.2.8 — Section Eight: Allegro assai** [bb. 697–782]

This final reinstatement of 𝐂 marks the limit to which Kirnberger's writings offer guidance; as noted earlier, *Die Kunst* is less informative for 𝐂 than it is for odd metres. The challenge with Quantz's four categories is that once you reach the 'fastest' category there is nowhere else to go. With the marking Allegro molto for section six followed by Allegro assai in section eight, both in 𝐂, it is clear that they have quite different feels and therefore demand their own tempo. Quantz's mean tempo between Allegretto and Allegro assai can be adopted to establish a quicker tempo which remains related to the pulse beat. With one minim per pulse (72 in a minute), this would yield 144 crotchets per minute. 144 × 1.5 = 216 can then be converted back to minims, giving 108 minims per minute. This both establishes the fastest point of the finale (thus far) and correlates the start of this closing section and return to the principal key with the opening section (𝅗𝅥 = 108).

**2.2.9 — Section Nine: Più allegro** [bb. 783–907]

Having surpassed Quantz's quickest tempo indication already, any further changes in tempo can only be marginal. The difference between the original pulse of 72 beats per minute and that of the moderate Allegro (108 BPM) is 36 beats per minute, an increment which remains relative to the pulse beat and the system emerging from it. Adding a 'half pulse' (36 BPM) to the previous Allegro assai creates a tempo of 144 minims per minute, double that of Quantz's fastest category (72 minims per minute), but still only allowing eight notes per pulse beat.

**2.2.10 – Section Ten: Prestissimo** [bb. 907–939]

A further increase of 36 pulse beats per minute facilitates a measured acceleration which is derived from the pulse beat governing the finale to this point. With a tempo of 180[33]

33 144 + 36 = 180

minims per minute it is necessary to convert the beat to semibreves which yields 90 per minute. Though it is not too far off, the 90 semibreves per minute with quaver passage-work exceeds Quantz's recommendation that there should never be more than eight notes per pulse beat.[34] In spite of this, however, the incremental addition of 36 beats per minute provides a suitable method to reach a climactic end to the finale, while remaining rooted to the pulse—even if not obviously—which has governed the tempos throughout.

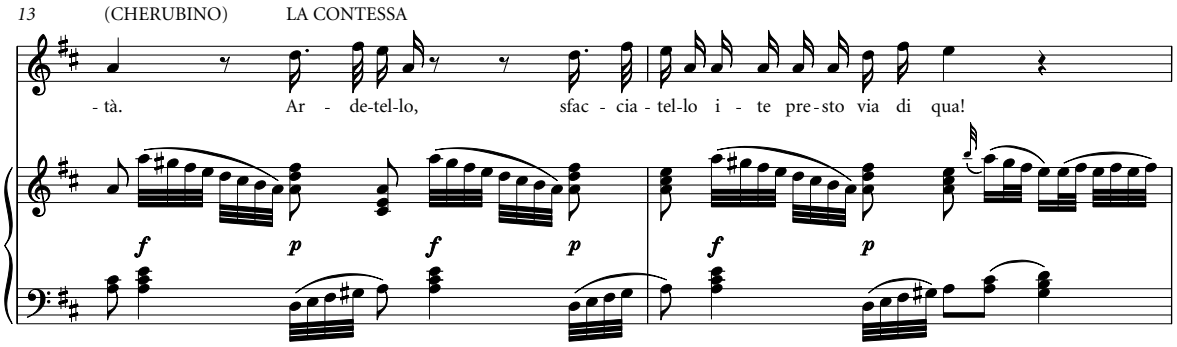
### 2.3 — The finale of Act IV

More modest in its dimensions, this finale complements some of the characteristics in the finale of Act II by closing loose ends in the drama rather than opening them. It is much less ambitious in scale, consisting of 521 bars of music in eight sections.

#### 2.3.1 — Section One: Andante [bb. 1–50]

Mozart starts the act IV finale in Andante **C**. Through these opening bars, the regular presence of demisemiquavers in the rhythmic exposition might suggest that it would be suitable to adopt Quantz's notion of Andante fitting within the Adagio cantabile bracket. This would yield a very slow tempo of 72 quaver pulse beats per minute. With the dotted rhythmic figures and counterpoint between orchestral parts, one strongly suspects that the orchestral animation—well matched with the unravelling confusion between Cherubino and the Countess (dressed as Susanna)—would be better portrayed in a marginally quicker tempo. The range of note values, from demisemiquavers in the strings through to semibreves in the winds, demands a tempo which can accommodate the players' needs (wind players' breathing), the snappy character of the string writing, with its dotted rhythmic figures and written embellishments, as well as awareness of the text, with its dotted rhythmic figures (seen in example 4) and semiquavers. As such, this Andante section may be better portrayed using Cook's moderate 54 crochets per minute, accommodating the multitude of qualities captured in this opening section.

34 Quantz, *Versuch*, 285




**Example 4**: Act IV finale, Andante, bb. 13–14

**2.3.2 — Section Two: Con un po' più di moto** [bb. 51–108]

The tempo is increased from the opening Andante, 'with a little more motion'. The 36 pulse beat increment used in the act II finale might be suitable here as it provides a relative and measured tempo change. Following this course would establish a tempo of 90 crotchets per minute. Semiquavers replace demisemiquavers as passage work, indicating again that a measured but salient tempo change is justified.

It could be argued that a metric modulation may be appropriate here. However, as Quantz's system is based on the 1:2 exponent such a change may be too dramatic in this case. Regardless of how this increase of tempo is related, this section change is unique within the finales of *Figaro* in that it is entirely reliant on that which came before it. Where the others could arguably be approached in isolation, this tempo indication only develops its preceding material.

**2.3.3 — Section Three: Larghetto** [bb. 109–120]

Larghetto falls within Quantz's Adagio cantabile category, which would suggest a quaver pulse of 72 pulse beats per minute. This is an extremely slow tempo and would stagnate the drama far too much, causing breathing difficulty for the bass-baritone's long lines. Fortunately Quantz provides a clause: if the bass is moving in crotchets and the melody is *arioso* (which it is), the tempo would be in crotchets rather than quavers.[35] With quaver triplets in the string accompaniment, repeated notes in the melody and long legato lines in the voice and clarinet part, there is an embedded sense of forward motion. 72 crotchets per minute

35 Ibid. 287

is certainly on the quicker end of the spectrum, though this ties with Kirnberger's general description of 3/4 as a lighter tempo.[36] However, Quantz's bass movement clause makes this more leisurely tempo contradictory to Kirnberger's interpretation of Larghetto. There is only one occasion where Kirnberger alludes to how he 'grades' the Italian adjectives, which includes the Larghetto:

> Once the young composer has a feeling for this, he will soon understand to what degree the adjectives *largo*, *adagio*, *andante*, *allegro*, *presto*, and their modifications *larghetto*, *andantino*, *allegretto*, and *prestissimo* add to or take away from the fast or slow motion of the natural tempo.[37]

With Kirnberger's definition of Larghetto sitting between Largo and Adagio, Quantz's 72 crotchets per minute, although seemingly appropriate according to the circumstances, transform this Larghetto into something closer to an Allegretto. As such, Cook's medium tempo may be more suitable for this passage, while also better setting up the approaching leap from Larghetto to Allegro di molto. On this occasion, either 72 or 54 crotchets per minute could be used.

**2.3.4 — Section Four: Allegro di molto** [bb. 121–274]

Continuing the triple metre of the Larghetto section, Mozart immediately thrusts Figaro's reflective moment into a pacy exchange with Susanna (disguised as the Countess). The fastest moment of the finale thus far, Allegro di molto is also Quantz's quickest category. The relationship in triple metre is less clear than in even metres, where it is directly exponential (1:2). The most obvious way that this transfers to triple metre is that 72 bars per minute is equivalent to the fastest category in duple metre, while the crotchet, quaver and semiquaver relation is common to both duple and triple metres.

Consequentially, an Allegro di molto in 3/4 would be one-in-a-bar, 72 bars per minute. The ongoing prominent semiquaver counterpoint in the strings, however, indicates that this would be too quick. Similarly, Mozart's syncopated setting of the text here could be problematic for the singers if taken too quickly. The obvious alternative would be to establish

36 Kirnberger, *Die Kunst*, 396
37 Ibid. 377

a tempo in crotchets; however using Quantz's standard recommendations this would be too slow. Once again, Quantz has a suggestion for this scenario, saying 'no definite tempo can be established in a single bar' and that one must take two bars together, allowing the pulse to fall on the first and third crotchets of the first bar and the second crotchet of bar two.[38] This would yield a one-in-a-bar tempo of 48 bars per minute, or 144 crotchets per minute.

**2.3.5 — Section Five: Andante** [bb. 275–334]

The previous two sections have felt both the slowest and the quickest respectively in this finale. Mozart returns to Andante, this time in 6/8 metre, suggesting that this may be the predominant and recurring *tempo giusto* of the finale. As asserted throughout this thesis, Andantes governed by a quaver pulse do not appear conducive to the nature of the music at hand. Thus, the solution is to take the tempo from the dotted crotchet beat. In this context, 72 dotted crotchets per minute may indeed work, though the moderate tempo taken from Cook (54 dotted crotchets per minute) better suits the forward momentum of this passage while accounting for its tender nature as Susanna and Figaro make peace with each other after a series of misunderstanding on Figaro's account throughout acts III and IV.

**2.3.6 — Section Six: Allegro assai** [bb. 335–419]

The drama is thrust from a pastoral 6/8 to a furious **𝐂**, a fixed metre for the remainder of the opera. The Count spies Figaro with the 'Countess' (Susanna in disguise) and calls for reinforcements to capture him. Once again, this Allegro assai is in Quantz's quickest category. With **𝐂** metre the and shortest duration being quavers, a tempo of 72 minims per minute would be the obvious pace for this section. As was demonstrated in the second act finale, one of the issues with Quantz's model is that once you reach the upper limit, there is nowhere else to go. In this instance, the relation of the Allegro di molto to this Allegro assai seems backwards: the Allegro assai should feel quicker and more urgent, but at 72 minims per minute it has a much slower and uninvolved feel than that of the earlier Allegro di molto. This section begs for a quicker tempo; after all, it is in this scene that the Count is at last fooled.

38 Quantz, *Versuch*, 286

**2.3.7 — Section Seven: Andante** [bb. 420–447]

The Count's shock at discovering the swapped identities of the Countess and Susanna brings about a complete dissipation of the energy built up previously. Mozart goes further on this occasion, however, not just providing a brief moment of reflection but making silence and stillness a central part of the moment by using rests and fermatas. The rhythm of this Andante typically moves in minims and short two bar phrases. Quaver broken chords in the violins set up the dotted rhythm in bar 436, leading to the sung quavers of 'contenti saremo così'. Semiquavers feature in the melody only as written out ornamentation (bb. 429 and 438 for example). There is no obvious 'passage work' in this section, so arguably one could take this much quicker, as it is without its 'upper limiter'. Or indeed, one could take it much slower, as without passage work rhythmic energy is replaced with a more flowing expression.

It will be of little surprise to the reader that, in my opinion, once again Quantz's quaver pulse Andante does not work here. Dramatically this moment is possibly one of the most important in the whole opera; the Count acknowledges his wrongs and pleads for the Countess's forgiveness in front of the whole cast: there is a resolution at last to this mad day. The swallowing of pride by Almaviva is what Susanna, Figaro and the Countess have been aiming for from the beginning of act II.

With the range of note values employed—from long held breves in the horns to the quaver movement in the violins as well as the big tutti dotted quaver–semiquaver moment—this section requires a tempo that supports a broader range of rhythmic detail, similar to the opening section of this finale. Cook's Andante (54 crotchets per minute) provides a suitable starting point which accommodates the various components in play.

**2.3.8 — Section Eight: Allegro assai** [bb. 448–521]

This final section of the opera sings out the remainder of *Le nozze di Figaro*. In **C** with quaver passage work, this Allegro assai echoes that of section six. As suggested in the

opening three sections of the act II finale, it is possible that Mozart intended the central Andante as a pause between two parts of the drama, the outer Allegro assai parts being linked. This is a convincing possibility in act II due to the narrative being carried between the outer sections. However, in this example, section eight focuses less on picking up from section six and more on bringing about the closure of the *opera buffa*. As such, there is a case for the two tempos not to be the same. Using the 'data' available to us, however, with **C** and quaver passage-work, this Allegro assai directly corresponds to the quickest of Quantz's categories, 72 minims per minute.

### 2.4 — Koch's *Versuch* of 1787: An alternative perspective

The most apparent outcome of the section-by-section assessment of these finales is that neither Quantz's tempo system, derived from the human pulse, nor Kirnberger's concept of *tempo giusto* transfer smoothly to application in practice. Whilst possible tempos have been suggested and various aspects of both treatises explored, a number of shortcomings have also been highlighted. The most problematic of these (in the context of this Mozart-based study) is the lack of information with particular regard to Andante tempo indications. Difficulties also arise in other forms, however. How does one overcome the 'upper limit' of the fastest tempo category in Quantz's method? If one follows the method strictly there is no distinction between a number of sections, which Mozart clearly differentiates in numerous ways. This thesis proposes one possible way to surpass this, drawn from Quantz, though in doing so it breaks certain rules (such as the 'cap' of no more than eight notes per pulse beat). With regards to Kirnberger's *Die Kunst*, it has to be admitted that the concept of *tempo giusto* has limited scope in Mozart's finales. Where useful insights are offered for the sections with more specific metric qualities (such as 3/8, 3/4, 2/4 and 6/8), the fact that **C** is used throughout with similar characteristics—almost always marked in Allegro or quicker, and with quavers as the fastest note value—indicates there is limited information to draw upon which helps us distinguish between them.

With these challenges occurring so frequently, it has to be considered that Mozart was exercising an alternative approach in his use of **C** metre in particular, one which tallies

more with the ideas of another music theorist active in the late eighteenth century. The composer and music theorist Heinrich Christoph Koch (1749–1816) began publishing his *Versuch einer Anleitung zur Composition* in 1782, with subsequent volumes appearing in 1787 and 1793. Unlike Quantz's and Kirnberger's treatises, there is nothing documentary which indicates that Mozart knew of Koch's. However, it is of relevance to this study because Koch's *Versuch* spans the period of Mozart's time in Vienna (1781–1791), the middle of this period being when *Figaro* was composed (1785–86). This makes Koch's writings possibly the most contemporary representation of the theoretical environment in which Mozart may have been active. In his second volume (1787), Koch writes about considerations of metre choice:

> As long as one considers the nature of things alone, it does not matter which rhythmical values one takes for the main beats of the simple even meter. But, since one must also take into consideration other circumstances, for instance, the subdivision of the main beats into smaller rhythmical values, the convenience of the performer etc., not all rhythmical values have the right to become the main beats of the measure.[39]

Danuta Mirka states that Koch's 1787 text about metre 'demonstrates that he was clearly aware of the idea of [Kirnberger's] *tempo giusto* and granted it in theory. Yet […] this idea is no longer alive in practice'.[40] The quote to which Mirka refers for this conclusion is given in full below in footnote 41, using her own translation. Mirka then concludes by calling Koch's commentary on metre 'the new tradition of metric notation'.[42] She is not alone in such a point of view; Hasty says of the 1787 volume that:

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39 Koch, *Versuch einer Anleitung zur Composition* vol. 2, 1787, 290. Trans. from Mirka, 'Topics and Meter', 363

40 Mirka, 'Topics and Meter', 363

41 Ibid. 364: 'A phrase in slow tempo should be set in 2/2 meter and a phrase in fast tempo in 2/4 meter in order that tones in slow tempo be designated with corresponding rhythmical values and so the sign and the signified brought into closer relation. If this rule were accepted, then the following phrase, if dressed in 2/2 [Example 13.2a, not reproduced here], would thus necessarily have to be executed slowly and in the following example [Example 13.2b, not reproduced here], dressed in 2/4, always fast. The rhythmical values would thus, even if not quite precisely, still to some extent determine the tempo of a phrase, and all the more precisely determined would be the expressions which one used to attach to each phrase in order to designate its tempo. Only that one does not follow the hint offered us by the nature of things. If it sometimes happens, then more by chance than on purpose because the use of both meters regarding tempo is treated completely at will. In most cases one proceeds the other way around and, availing himself with a simple even meter, uses 2/4 for phrases in slow tempo and 2/2 for those which should be performed in fast tempo.'

42 Ibid.

> Although Koch's highly suggestive psychology of metre has had little influence on subsequent musical thought, the late-eighteenth-century understanding of measure that his writing expresses with exceptional precision has been little altered.[43]

It is seemingly agreed that Koch's *Versuch* captures a more modern way of thinking about metre, one which has remained a part of western music theory since the late 1700s. But how does this aid us in tackling Mozart's finales?

The most recurringly difficult areas in these finales for both Kirnberger and Quantz are in relation to the sections in 𝐂. Instinctively we (I mean 'we' in the truly universal sense, based on Cook's survey of recordings[44]) feel they should be quicker than the conditions—such as the exclusive use of 𝐂 and no 𝔠 time signatures—imply. Koch's writings suggest that such instincts are not unfounded. He marks a development in the eighteenth-century definition of *Takt* from that previously presented by Mattheson in 1739. For Mattheson, a tactus or *Takt* is a single beat in two parts, returning to the notion of *thesis* and *arsis* cited earlier in this chapter; something that is divisible but which is always constituted of two parts.[45] Koch instead conceptualises of *Takt* as a bar in the sense which is now standard modern German usage of the term, made up of *Taktteile*, literally translating as 'parts of a bar', or more suitably translated as 'pulses'. Theorists before Koch advocate that music which forms a bar (or a series of bars making up a phrase) fits within existing inflections and patterns, commonly drawn from dances. Kirnberger's *tempo giusto* clearly stems from this logic. Koch presents the notion of the bar as a more malleable entity which can be adapted to accommodate a range of styles. The significance of this development is that it suggests a more neutral metre and bar which dispenses of pre-existing inflection, markedly contrasting to all preceding discourse on metre.

Rather than metre and bar growing from division of the internal rhythmic qualities of Mattheson's *Takt*, Koch's *Taktteile* are multiplied and essentially added together to synthesise the formation of a bar (Koch's version of *Takt*).[46] The most noteworthy aspect of this is the

43 Hasty, *Meter as Rhythm*, 32

44 See Cook, *Analytical Study*, 396, which demonstrates the range of tempos recorded over a 70 or so year period

45 Mattheson, *Der vollkemmene Capellmeister*, 365 and 876

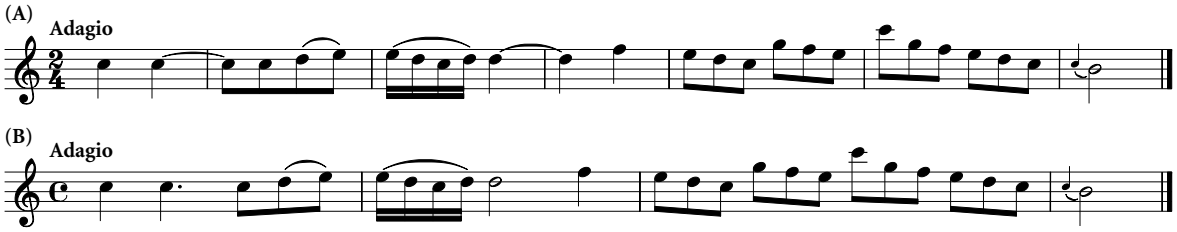
46 Hasty, *Meter as Rhythm*, 27

hierarchy of the beats within the bar, which are considered more equal than had previously been the case. It is in this respect that Koch's text brings familiarity for the twenty-first-century musician and marks a progression from the theories set out by Mattheson, Quantz, Kirnberger and many others. This change is reflected in a shift in aesthetics too, as Johann Georg Sulzer's posthumously published second volume of *Allgemeine Theorie der schönen Künste* states in 1792:

> It is the basis of unity; for many things, laid next to one another or following upon one another, whose disposition or order is determined according to a single form or single rule, can, with the support of this form, be held together in a single concept, and to this extent constitute One thing.[47]

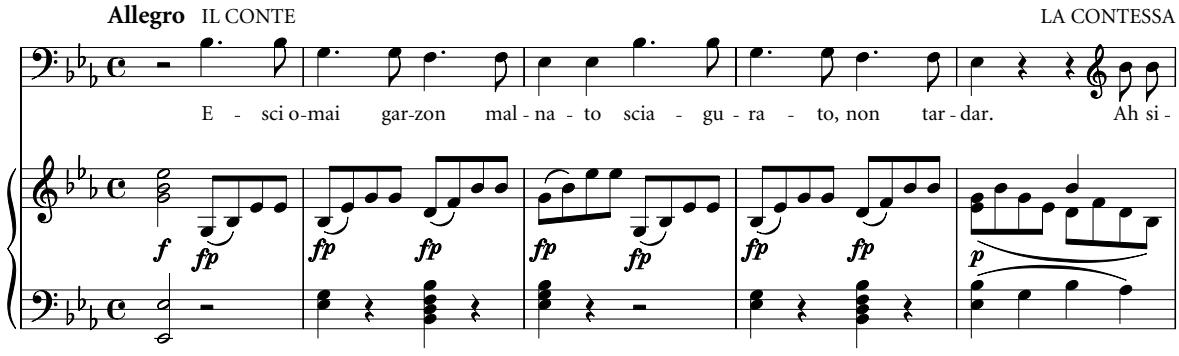
Unity is captured by Koch's theory of metre in his concept of *Zeitraum*, a period of duration which has no inherently distinguishing features.[48] Hasty proposes that 'Koch […] is not especially concerned with the unity of *Takte* and *Taktteile* as a "formal category", but rather with the process through which many become one'.[49] This idea of unity through multiplicity extends to the formation of bars (*Takte*) and its constituent parts (*Taktteile*) through Koch's idea of *zusammengesezte Taktart*: compound bars. Kirnberger proposes a similar definition of compound metres in 1777, one which differs greatly from our understanding today.[50] Kirnberger's primary argument for this is that it allows 'performers to arrive at the proper performance' with strong and weak 'beats'. It also affects whether a cadence can occur on a weak beat, which would not be the case in **C** but which is perfectly acceptable in a compound metre of four crotchets (two 2/4 bars).[51] (This can be observed in example 4 on page 38.) Koch closely echoes Kirnberger, though; as cited above, his theory clearly emerges more out of his notion of beats being multiplied and more equal. Koch demonstrates the merit of his compound bar through the following example (example 5), in which he notates the same passage, first in seven bars, then in a neater four.[52]

47 Sulzer, *Allgemeine Theorie der schonen Kunste* vol. 2, 21. Taken from Hasty, *Meter as Rhythm*, 27
48 Koch, *Versuch einer Anleitung zur Composition* vol. 2, 1787, 268–70
49 Hasty, *Meter as Rhythm*, 27
50 Kirnberger, *Die Kunst*, 398
51 Ibid. 399
52 Koch, *Versuch einer Anleitung zur Composition* vol. 2, 1787, 302




**Example 5**: Koch, *Versuch einer Anleitung zur Composition*, vol. 2, pp. 302–303

Returning to *Le nozze di Figaro*, there is no documentary evidence to suggest Mozart was aware of Koch's writings as a theorist nor that the two ever crossed paths. However, it is likely that Koch's incipient theory captured a trend which was already being practiced to some degree. It is also quite feasible that his ideas were practiced more widely in the German speaking territories of Europe in the 1780s. In any case, it is possible that the resulting suggestions from Kirnberger's and Quantz's application in the finales of *Figaro* are so similar because Mozart's use of 𝐂 metre and quaver passage-work represents a more broad ranging and diverse account of how metre can be interpreted. Both Wye Jamison Allanbrook and Danuta Mirka support this possibility based on their particular interests in topic theory: By being less prescriptive in his choice of metre, Mozart accommodates a greater number of topics and styles within any one particular passage.[53] Thus, according to Allanbrook, section one of the act II finale is inflected as a march, a bourrée, or 'even as a tentative gavotte', musically commentating whether or not the Count or the Countess is in command.[54]




**Example 6**: Act II finale, Allegro, bb. 1–5

Revisiting the act II finale with Koch's approach to metre offers an alternative perspective as to how 𝐂 might have been viewed and used in Mozart's environment. The areas which are worst served by Quantz and Kirnberger are those where 𝐂 is combined with a tempo

53 See Allanbrook, *On the Rhythmic Gestures of Mozart* and Mirka, *Metric Manipulations in Mozart and Haydn*

54 Allanbrook, *On the Rhythmic Gestures of Mozart*, 121

indication of Allegro or quicker. The opening Allegros (sections one and three) stand out as problematic. If taken in the tempo derived from Quantz (𝅗𝅥 = 108), just the opening three sections alone would last eleven minutes, completely dwarfing the remaining seven sections (or six, as chapter 3 explores). Based on Quantz's and Kirnberger's treatises, one expects a crotchet pulse because of the 𝐂 metre. As illustrated in example 6, however, Mozart adopts the minim as the pulse, which both the melody and the accompaniment adhere to quite strictly throughout each section. According to Koch, this indicates that the minim is the *Taktteil*, the part of the bar which is multiplied and synthesised to create a bar (*Takt*). This is irrespective of the implied crotchet denoted by the metre. In both finales this occurs at every instance where an Allegro (or quicker) tempo marking is combined with 𝐂. The Andante 𝐂 section which begins act IV is notably different, following the expectation that the crotchet will be the pulse (*Taktteil*). It also demonstrates 𝐂 being used to make compound bars, as example 4 shows. This marks an incredibly subtle but important metrical difference, suggesting that Mozart conceived of 𝐂 metre in Allegro and in Andante in completely different ways. More importantly, it indicates that metre may not have been Mozart's main defining factor in determining a pulse.

### 2.5 — Towards a synthesis of theories

This chapter surveys three influential sources representing late eighteenth-century approaches to tempo, rhythm and metre, with a particular focus on the acts II and IV finales from *Le nozze di Figaro*. Unsurprisingly, it is apparent that Mozart's music does not correspond directly with any one theory. Using these theories, however, we gain greater insight into the possible slew of theoretical discourse Mozart may have been engaged with.

One might expect a case for a definitive set of tempos (beats per minute) to materialise from a chapter on this subject. Instead, what emerges are two crucially important factors. The first is that theory on tempo, metre and rhythm was very much in 'a state of flux' in the late eighteenth century. One simply cannot draw any single conclusion from such a fluid theoretical domain. The second and more significant factor is that it seems Mozart exercised a much more nuanced approach in his use of tempo and metre than one might

expect. Taking these into consideration, I believe the quest for 'absolutes' is an extremely unhelpful approach.

The tempos suggested in parts 2.2 and 2.3 of this chapter are intended as starting points based on the two theories considered. Kirnberger's *tempo giusto* is particularly useful for demonstrating stylistic possibilities implied within a metre. The model documented by Quantz offers a method for establishing a tempo which, as demonstrated here and by Cook, can be usefully adapted to suit certain circumstances, such as creating an Andante tempo or using a half-pulse to control changes in extreme tempos.

Using the insights of Quantz's pulse method and Kirnberger's *tempo giusto*, a natural segregation occurs between the ease of classifying 2/4, 3/8 and 6/8 metres and the limited and similar guidance for **C**. The incipient theory of Koch offers a prospective explanation for this rift, the benefit of which is most useful in the sections where Allegro is combined with **C**. Such a divide has been identified in a recent article by Jean Paul Ito following a corpus study of Mozart's symphonic and instrumental works. Ito proposes that Koch's conception of compound metre is only evident in Mozart's music in certain applications of **C**, whilst it is hardly ever present in uses of most other metres.[55]

What this divide demonstrates is that Mozart's use of metre simultaneously embraces both traditional metrical patterns and a more modern outlook on metre. As a result, I propose that any attempt to better understand the temporal design employed in the acts II and IV finales of *Le nozze di Figaro* will benefit from the synthesis of theories on tempo, metre and rhythm. In doing so, one enjoys the 'best of all worlds', reflecting the changeability of this era as well as the intricacies of Mozart's temporal strategies.

55 See Ito, 'Koch's Metrical Theory and Mozart's Music: A Corpus Study', 202–222

# Proportionality in the Act II finale of *Le nozze di Figaro*

> There are no rational 'proportions' whatsoever in Mozart's music, too much nonsense has already been written about that topic.[1]

> If Mozart or anyone else used the Golden Section in constructing their music, that is no profounder or more audible, I should say, than, for example, Maxwell Davies' use of Fair Isle knitting patterns.[2]

## 3.1 — Introduction

In the early stages of this project I corresponded briefly with Helmut Breidenstein about my prospective research. His point-blank refusal to entertain even the possibility that there might be something of interest in the proportions of Mozart's music intrigued me. Through the course of my research it has become apparent that the prospect of significant proportional relations in Mozart's *oeuvre* is viewed with suspicion; the topic is confined to a number of blog posts and anecdotal online resources. With Mozart scholarship being such a vastly populated area of musicology, it is particularly striking that academic literature has overlooked this subject. Due to the lack of literature, two articles in particular stand out: 'The Golden Section and the Piano Sonatas of Mozart' by John F. Putz and 'Time and temporal proportion: The Golden Section Metaphor in Mozart, music, and history' by Jane Perry-Camp.[3] Interestingly the former article is written from a mathematician's perspective as opposed to that of a musicologist. To an extent, this provides an additional dimension to the topic, though it also lacks recognition of Golden Section as an aesthetical principle as much as a mathematical absolute, something I will address more fully in due course. This chapter will first briefly examine Mozart's interest in mathematics, more specifically number theory, before investigating aspects of division in extreme and mean ratio (DEMR, a more historical term than Golden Section) in his music more fully and proposing evidence of DEMR in the act II finale of *Le nozze di Figaro*.

1 Personal correspondence: Email from Helmut Breidenstein
2 Personal correspondence: Letter from John Thomas
3 Putz, 'The Golden Section and the Piano Sonatas of Mozart', 275–282 and Perry-Camp, 'Time and temporal proportion: The Golden Section Metaphor in Mozart, music, and history', 133–176

Johann Andreas Schachtner, a close family friend of the Mozarts, famously remarked that 'when [Mozart] was doing sums, the table, chairs, walls, even the floor were covered with chalked figures'.[4] Teenage correspondence between Mozart and Nannerl, in which he requests more *Rechenhistorien* (number games or puzzles) and *Kuensten* (tricks), supports the notion of the young composer's fascination with numbers.[5] But did this interest continue throughout the composer's life? As this chapter demonstrates, certain sketch leaves reveal that this interest did indeed extend into Mozart's adulthood.

As with Golden Section, the exploration of 'numbers and Mozart' has typically received more attention in anecdotal rather than academic literature. In an article in *The Guardian*, Marcus du Sautoy proposes that the string of numbers famously sung by Figaro in the opening scene of *Le nozze di Figaro* (5, 10, 20, 30, 36, 43) are a 'curious sequence of numbers', the sum of which is 144, giving 12 as a square root. Du Sautoy suggests that this is a 'numerical representation of the impending union of Figaro and his bride Susanna'. This is followed by the proposal that the collection of numbers which appears in a letter from Mozart to Constanze (10950604370 82) can be added as follows: 10 + 9 + 50 + 60 + 43 + 70 + 82 to reach 324, the square of which is 18, 'expressing the bond of love between Mozart and Constanze'.[6] If this were the case it would suggest an almost obsessive personality which would surely impact on his composition. Although du Sautoy's observation of the relationship between Figaro and Susanna is reasonable (based on characters projected in the narrative), why should Mozart have chosen the number 144 or its square to express it? While the number 12 has all sorts of possible meanings, there is a dangerously one dimensional tone to du Sautoy's article, suggesting that the presence of this numerical possibility implies (or even indicates) a commentary on the relationship between the two lovers which is somehow more meaningful or 'perfect' than the image of Figaro physically measuring space for their marital bed. This article is a perfect example of the anecdotal treatment this topic typically receives.

4 Deutsch, *Mozart: A Documentary Biography*, 451–454

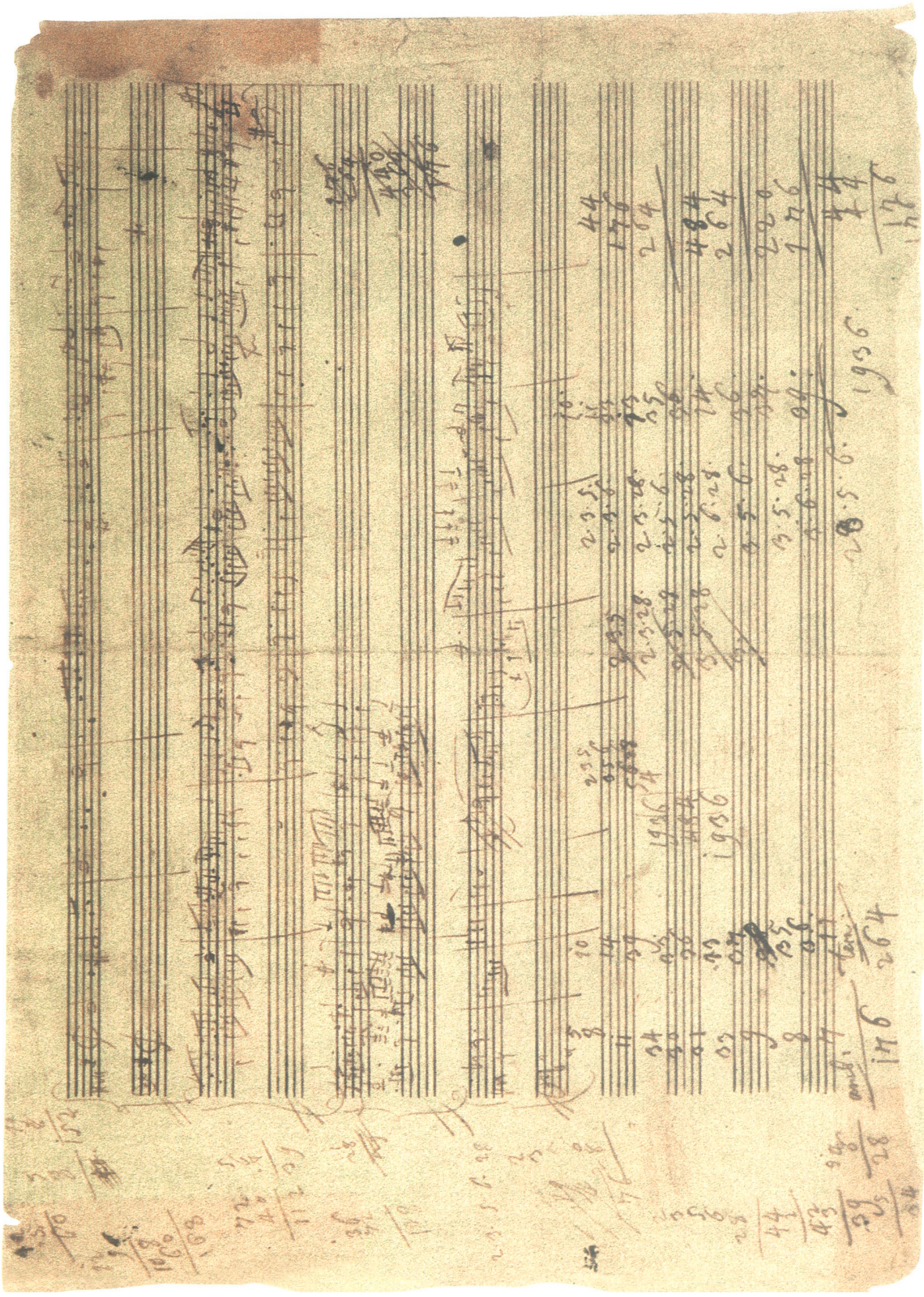
5 MBA, vol. 1, 349

6 *The Guardian* 5 April 2013 <https://www.theguardian.com/music/2013/apr/05/mozart-bach-music-numbers-codes> accessed 10/08/2016

As with Putz, du Sautoy writes his piece as a Professor of Mathematics at the University of Oxford. Daniel Leeson, whose research will be explored shortly, falls into an even more curious category. He combines respectable contributions to Mozart scholarship through publications in the *Mozart-Jahrbuch* and editing volumes of the NMA with a thirty year career with the IBM Corporation and a retirement spent teaching college-level mathematics. The impression which emerges, however, is that any relationship between Mozart's interest in numbers and his music seems of greater appeal to mathematically-minded individuals. Leeson even differentiates between musicological and mathematical 'value' when referring to Mozart's sketches.

Leeson's article 'Mozart and Mathematics' presents a fascinating overview of a sequence of numbers found on a sketch leaf from 1782. The thesis suggests that Mozart's mathematical ability may well have been quite advanced, albeit under-developed. Leeson begins his study with a well known anecdote about the mathematician Carl Friedrich Gauss as a five-year old. On his first day of school, Gauss and his classmates were instructed to add the numbers from 1 through 100. While his classmates struggled for an hour, Gauss immediately wrote an answer on his slate. The teacher stared at Gauss for the hour before checking his answer, which was correct – 5050. With no training, he almost instantly derived his answer through an advanced method.[7] The parallel between child Gauss and child Mozart is obvious; both demonstrate promise as child geniuses before developing, cultivating and maturing in their respective disciplines. Essentially, Leeson's suggestion is that, had Mozart's mathematical ability been as cultivated as his musical ability, he may well have been a highly adept number theorist. Of course, we will never know whether this might have been the case, but the natural ability which Leeson insinuates could have considerable ramifications on how Mozart might have approached his music.

7 Though it is not hugely important for the purpose of this chapter, for anybody interested in knowing how Gauss is said to have reached his answer, Leeson summarises: 'Temporarily putting aside the last number, 100, he observed that the sum of 1 and 99 is 100; the sum of 2 and 98 is 100, the sum of 3 and 97 is 100, …, and the sum of 49 and 51 is 100. The sum of these 49 pairs totals 4900. Then, adding the 100 that was temporarily put aside and the unpaired 50 from the middle of the sequence, the five-year old Gauss arrived at 5050.' Leeson, 'Mozart and Mathematics', *Mozart-Jahrbuch* (1999), 13–33



**Example 7a**: Skb 1782j verso

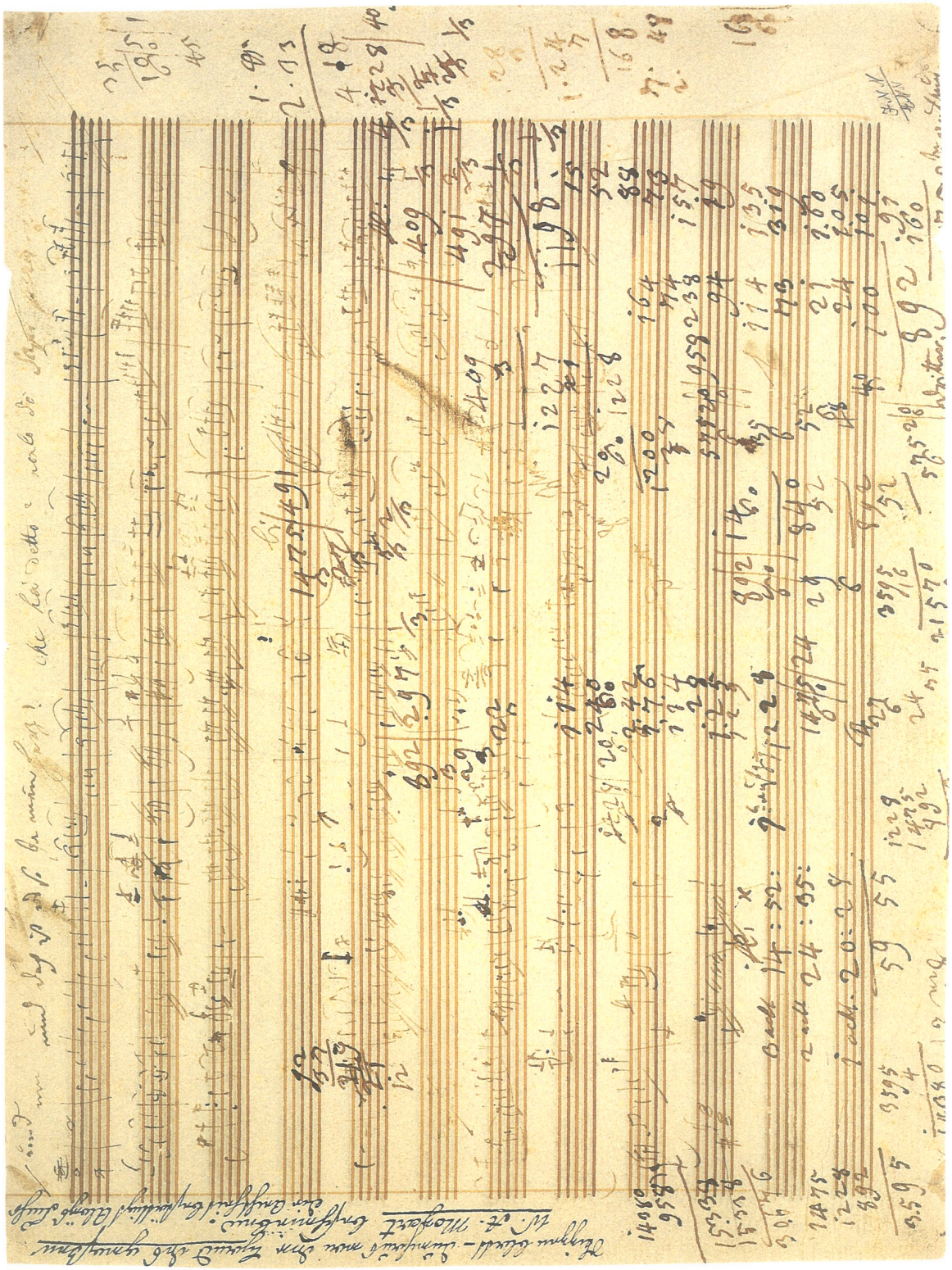
| | |
|---|---|
| 5 [2 + 3] | 10 [2+3+5] |
| 8 [3 + 5 or 2 + 6] | 14 [3 + 5 + 6] |
| 11 [5 + 6] | 39 [5 + 6 + 28] |
| 34 [6 + 28] | 33 [2 + 3 + 28] |
| 30 [2 + 28] | 36 [3 + 5 + 28 or 2 + 6 + 28] |
| 31 [3 + 28] | 13 [2 + 5 + 6] |
| 33 [5 + 28] | 37 [3 + 6 + 28] |
| 9 [3 + 6] | 35 [2 + 5 + 28] |
| 8 [2 + 6 or 3 + 5] | 36 [2 + 6 + 28 or 3 + 5 + 28] |
| 7 [2 + 5] | 11 [2 + 3 + 6] |
| *amb.* | *tern.* |
| 176 | 264 |

**Example 7b**: Transcription from Skb 1782j verso

The sequence of numbers found on Skb 1782j verso (example 7) is as follows: 2, 3, 5, 6, 28. These numbers create a quintuple which Leeson coins the 'Mozart set'. Mozart takes these numbers through a series of processes. Initially, adding them to reach 44, then adding pairs (*ambedue*) to reach 176, four times the sum of the quintuple. He then repeats this, adding groups of three (*ternario*) to reach 264; six times the sum of 44 (example 7a). Mozart squares the sum of the quintuple, 44, reaching 1936. He also adds the sum of the set, *ambedue* and *ternario* together to reach 484. Leeson speculates that Mozart had established that the sum of the quintuple, its pairs and its groups of three was one quarter of the sum of the quintuple squared.[8] Whether this was what Mozart was setting out to prove cannot be said with any certainty. Nonetheless, Leeson makes a very firm proposition: though the origin of these five numbers is uncertain, the properties which Mozart explores between them are unique to these numbers. Leeson proposes a method for establishing the same number relations, but none of them yield this property. In a final bid to convince the reader, he states:

> I do not suggest that Mozart saw the algebraic generalizations that I have speculated as defining the set, and I have no way of knowing if he visualised the entire problem in any abstract form. But that he visualised it at all, considering his lack of mathematical education, is remarkable.[9]

8 Ibid. 20
9 Ibid. 21



**Example 8a**: Skb 1782d recto

In 1959 Wolfgang Plath published his article 'Das Skizzenblatt KV.467a' in the *Mozart-Jahrbuch*.[10] As with Leeson's sketch leaf from 1782, one particular sketch leaf stood out and caused great difficulty to Plath due to its numerical content. Observing a reproduction of the leaf (example 8) it is immediately cryptic, with its combination of musical material and haphazard distribution of numbers. After grappling with this, Plath eventually recognised the following sequence of numbers as bar counts of each movement in *Die Entführung aus dem Serail* sorted into three columns, each representing an act of the opera.

| | | |
|---|---|---|
| 114 | 15 | 164 |
| 240 | 52 | 74 |
| 60 * | 88 | 238 |
| 242 | 73 | 94 |
| 172 | 157 | 114 |
| 114 * | 19 | 73 |
| 28 | 135 | 21 |
| 125 | 319 | 24 |
| 129 | 160 * | 100 |
| | 105 | |
| | 101 | |
| | 91 | |
| | 160 | |
| **1228** | **1475** | **892** [11] |

**Example 8b**: Transcription of Skb 1782d recto

Plath assigns each bar-tally with a number from the *singspiel*. They do not always appear in correct order and, as noted, there are one or two miscounts. These tallies suggest that Mozart was making a conscious effort to audit *Die Entführung* and compare its acts, demonstrating a very basic interest in the proportional dimensions of the opera. Regarding this particular discovery by Plath, Robert Levin says of Mozart; 'he is looking architecturally, he is looking proportionally; these things matter to him, in a way that they didn't matter to a lot of other people'.[12] The ubiquitous image of Mozart channelling perfection straight from creative impulse to the page has long been dismissed, but the act of counting bars implies a creative process which is much more regulated and conscientious. It is all too

10 Plath, 'Das Skizzenblatt K.V.467A', *Mozart-Jahrbuch* (1959), 114–26

11 * Denotes an error of usually one or two bars between Mozart's sketch leaf and the published bar counts found in *Die Entführung aus dem Serail*.

12 Levin, 'Improvising Mozart', 58'50" (2012) Accessed online via YouTube <https://www.youtube.com/watch?v=wkFdAigjmLA&t=3530s>

tempting then to make the jump and conclude that if Mozart was counting bars in 1782, by 1786 he might also have been planning proportions with a more aesthetic ambition in mind, which might even include DEMR, better known as Golden Section. Indeed, it was the knowledge of Plath's discovery, which I learned from an online lecture given by Levin, that galvanised me to investigate proportion in the finales of *Le nozze di Figaro* more closely.[13] Having since had the opportunity to study both the sketch leaf in question (Skb 1782d) and Plath's article myself, Mozart's adding and counting does not seem quite so concerned with 'architecture' and proportion as one might be led to believe by Levin's comments. What Mozart does with the tallies listed above is indicative of a more pragmatic result, almost certainly financially related due to the presence of *fl* (florins or *Gulden*) and *x* (*Kreuzern*). There are three processes beyond 'counting bars' which do not always seem related:

First, Mozart takes the total bar count of each act and divides them by three [409⅓, 492⅔, 297⅓] which he then adds together [reaching 1198⅓, though it should in fact be 1199⅓]. Second, he divides each act total by 60, sorted into two columns *fl* and *x* and adds these together to reach 59 *fl* and 55 *x*:

| | |
|---|---|
| I | 20 : 28 |
| II | 24 : 35 |
| III | 14 : 52 |
| | **59 : 55** |

Third, Mozart then adds the three acts' tallied totals together [3595] which he multiplies first by four, then by sixteen [14380 and 57520]. He divides the latter sum by 60 [giving 958 with 4 remaining], which he adds to the first result [15338] and doubles [30676].[14]

Plath clearly worked hard to decipher these numbers, stating 'Wie man sieht, verlieren sich die Berechnungen […] allmählich ins Nebulose'. ('As you can see, the calculations get lost […] gradually becoming nebulous.')[15] In addition to the references to *fl* and *x*, we can

13 This is one of two lectures given by Levin in a series presented by CRASSH Cambridge entitled 'Improvising Mozart'. The other lecture is 'Composing Mozart'. Due to their being online lectures, his citation of Plath was not documented. My discovery of Plath's paper was through a citation in Leeson's, which I found some three years after first watching Levin's lectures.

14 Plath, 'Das Skizzenblatt KV 467a', 122

15 Ibid.

confirm that this is a financial exercise because of the various divisions of 60; one florin in Mozart's Vienna is made of 60 *kreuzer*.[16] We cannot ascertain any more than this, however. Plath suggests the possibility that Mozart is calculating fees for copyists, but reckons that the figures are too high for this. Another possibility is that Mozart is calculating his own fee, though we know he received 450 florins for *Die Entführung*.

What we can say with confidence is that this exercise clearly did not relate to proportion. I have the utmost respect and admiration for Levin, both as a scholar and performer, though in this particular case it must be acknowledged that either he did not read Plath's article on Skb 1782d himself, or he must have decided to ignore the fact that Plath makes it clear that there was a financial angle to the counting of bars in *Die Entführung aus dem Serail*. Associating this with 'architecture' and proportion has no validity in the context of Plath's findings. What was initially the stimulus for my interest in proportion in Mozart's operas eventually morphed into its very own dead end, indicating that Mozart may not have overtly demonstrated any particular interest in proportion at all.

With any glimpse of an overtly proportional Mozart ruled out, what about the *covertly* proportional Mozart? Might there be some sort of 'hidden' matter of proportional interest within the music? Before presenting any evidence at all I must cite Ruth Tatlow's indispensable (and appropriately titled) article 'The Use and Abuse of Fibonacci Numbers and Golden Section in Musicology Today'.[17] Tatlow articulates, in no uncertain terms, that composers before the nineteenth century could not have intentionally used this proportion because it was not yet universally known, named, and it was not yet held in such cultural and mystic regard. The principal objective of her article is to 'right the wrongs' which have come to overpopulate musicological discourse on Golden Section in recent years, paving the way for a more scholarly perspective on the matter. Tatlow provides a 'number of indisputable historical principles that should guide the analyst'. Two of these summaries are particularly useful in relation to mid- to late- eighteenth-century Europe:[18]

16 Baumol W & Baumol, H, 'On the Economics of Musical Composition in Mozart's Vienna', 171–198
17 Tatlow, 'The Use and Abuse of Fibonacci Numbers and Golden Section in Musicology Today', 69–85
18 Ibid. 85

> xi) Any composer using the additive numerical sequence before *c*1600 would have had no idea that it was an approximation of Euclid's DEMR or Pacioli's *De Divina Proportione*.
>
> xii) There is no documentary evidence to suggest that composers between the period *c*1600 and *c*1830 had any interest in using Euclid's ratio or the additive sequence in order to emulate a 'divine proportion'.

What Tatlow refers to as 'golden numberism'—implying an almost obsessive search for and application of Euclid's division in extreme and mean ratio to music—did not exist until the late nineteenth century. Thus, any prospect of Mozart consciously embedding this into his music is immediately quashed. That does not mean to say, however, that DEMR does not exist in Mozart's music at all. Regardless, it is hoped that the following evidence is compelling and worthy of dissemination.

### 3.2 — DEMR and the Act II finale

Division in extreme and mean ratio is a geometric proportion, not considered numerically until the mid-nineteenth century.[19] Its geometric existence extends back as far as 300 BC with its initial formal definition in Euclid's *The Elements*. It is an elegant ratio with a satisfying key characteristic of wholistic balance: AB:AC = AC:CB.

A——————————— C ——————— B

As outlined already, the two chain finales in *Figaro* advance through a series of key, time signature, and tempo changes (or combination thereof). If one were searching for significant instances of DEMR it would be striking for these moments to fall on (or at close proximity to) one of these section changes. Much more fanciful suggestions of DEMR have been put forth, such as the A♭ major chord in bar 21 of *La fille aux cheveux de lin* where the harmonic shift is deemed enough of a change to warrant being labelled an instance of Golden Section.[20] The coinciding of a point of DEMR with a section change in one of the finales in *Figaro* might be significant, as it could be considered as an instance of structural proportionality.

19 Ibid.

20 This particular example is weak, though there are plenty of convincing cases of DEMR in Debussy's music. See Howat, *Debussy in Proportion: A musical analysis*, 1986

The Fibonacci series [0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, etc.] has come to be viewed as a numerical expression of DEMR in whole numbers. A more precise and mathematical method of calculating DEMR is found by multiplying the whole (1) by 0.382 (negative) or 0.618 (positive).[21] The points of negative and positive DEMR in the finale of act II fall at bars 358 and 580 respectively.[22] Both of these do not fall near a tempo change, nor any other moment of significance in the music and plot. Bar 358 is within the fourth section and occurs exactly midway through an exchange between the Count, saying 'Pian piano men fretta' ('One moment, not so fast') and Figaro, who retorts 'La turba m'a spetta' ('But the crowd are waiting'). Figaro, eager to get on with his wedding, is being coaxed into a trap by the Count. Similarly, bar 580 occurs within the sixth section, following the drunken gardener Antonio's entry. The Count's utterance 'Che pazienza' ('What patience') lies at the point of DEMR in question, in the midst of sarcasm and confusion between Figaro and Antonio. In both of these, we find a brilliantly comic scenario unfolding, but this is not unique to these moments; it is typical both throughout the finale and the opera in general. In summary, one cannot attribute significant occurrences of DEMR to either of these points.

To an audience today this would be a closed case: these finales are, like the arias and most of Mozart's work, viewed as a complete, unchangeable entity – an autonomous musical work. However, evidence from 1786 suggests that this finale has not always been performed in its entirety as we know it today. Lorenz Lausch was active in 1780s Vienna as a copyist (though according to Dexter Edge his connection with Mozart, and *Figaro* in particular, remains uncertain).[23] On 1 July 1786 he placed an advert in the *Wiener Zeitung* offering numbers from *Le nozze di Figaro* in full score or for string quartet.[24] This advert lists every number from each act, including the various scenes of the finales. A handful of numbers are omitted, specifically numbers 4 and 5, (Bartolo's aria 'La vendetta' and Susanna and Marcellina's duet 'Via resti servita') and 28 (Marcellina's solo aria 'Il capro e la capretta'). Cutting of solo and other smaller numbers was common practice, though this advert also omits the

21 By 'positive' and 'negative' points of DEMR, I refer to the fact that a positive DEMR will be 'beyond' the half-way point while a negative DEMR will be within the first half of whatever is being measured, and that both are equally valid examples of DEMR.

22 939 × 0.382; 939 × 0.618

23 Edge, *Mozart's Viennese Copyists*, 39

24 Ibid. 1459

fifth section of the second act finale ('Conoscete signor Figaro', bar 398). This is particularly significant as it documents how *Figaro* might have been known and performed in 1786.[25]

Though indicative, this alone cannot be deemed as conclusive evidence of the exclusion of the 'Conoscete signor Figaro' section from the finale. Edge makes an independent assessment of this cut. Using the original orchestral materials and other primary sources from 1786, he confirms that this section and others on the list of Lausch's advertisement were indeed cut. With the absence of the act II finale from the original performing score, full verification of the fifth section being cut is not possible, but Edge documents three key points: This cut exists in the original orchestral parts, though the section appears to have been reinstated and cut numerous times; the section is missing from the Donaueschingen score, which is likely to have descended from the performing score; and the section is present in the score formerly held in the archive of the *Hofkapelle* [A-Wn, S. m. 4160], which Edge believes may have been the emperor's personal copy.[26] From these three points, Edge summarises that the *Hofkapelle* copy was likely to have been made prior to the section being cut. Additionally, he compares the handwritings, colours and types of crayon used in the orchestral parts with information gained regarding other productions of *Le nozze di Figaro* which used these parts. He suggests the original instance of the cut in question most likely did occur in the 1786 production.[27]

The motivation for cutting these 69 bars is not clear; there is no recorded reference to it from Mozart or anybody else involved in the 1786 production other than the sources mentioned. The benefits of it are rather oblique. Considered alongside the other known cuts, it is possible that the aim was to reduce the overall duration of the opera. Enforcing each of these cuts would probably save around 12–15 minutes in total. This does not seem a significant amount in the context of a three-hour opera, particularly given the reported reception, with encores being in such high demand.[28] The omission of 'Conoscete signor Figaro' is more puzzling as it disrupts the culmination of an ongoing sub-plot, which begins

25 Ibid. 1458

26 Ibid. 1608. Edge goes into great detail on the cuts and reinstatements of 'Conoscete signor Figaro'. For his full account on this matter (and others cuts of the opera) see chapter 9 of his thesis in full.

27 Ibid. 1609–1612

28 Landon, *Mozart: The Golden Years*, 163

at the start of act II and is referred to again by the Count in his soliloquy at the opening of act III. During the recitative following 'Porgi, amor', Figaro says to the Countess:

> … Ecco il progetto:
> per Basilio un biglietto
> io gli fo capitar che l'avvertisca
> di certo appuntamento
> che per l'ora del ballo
> a un amante voi deste …
>
> Here's my plan: By Basilio I've sent a letter warning his lordship about an assignation which you've made with a lover for the time of the ball.

The sub-plot concerns an anonymous letter written to the Count by Figaro, alerting him to a romantic rendezvous between the Countess and an unknown lover. As part of this scheme, Susanna is to have her own rendezvous with the Count but send Cherubino in her stead (dressed as a woman). This scene instigates the ongoing sub-plot of the letter, but also demonstrates that Figaro has the measure of the Count and is resolute in his mission to prevent him from exercising his feudal right (or *droit du seigneur*). Summing up the drama thus far, act I introduces the characters and various tensions between them, but act II initiates the intrigue, confusion, conflict and comedy which ensues throughout the opera, all of which have come to be so well known and enjoyed. Essentially, although the business of the anonymous letter is just a sub-plot, its effect on and proximity to the main events of the opera are significant.

Omitting 'Conoscete signor Figaro' from the finale of act II leaves a loose-end in the chain of events, but it is unlikely to have been noticed by the audience. Entertaining the possibility that these bars were cut from the 1786 performances, as Edge suggests, one cannot affirm any immediate reason for cutting this section. Might this cut be the consequence of proportional awareness, covert or otherwise? Taking the 939 bars of the second act finale and removing the 69 of this section leaves 870 bars. Repeating the process of establishing positive and negative points of DEMR from this revised bar count yields quite a different result.

The negative point is found at bar 332, at four bars proximity to the beginning of the fourth section (bar 328). This is the exact bar at which Figaro enters for the first time since the recitative at the beginning of act II, in which he plots the aforementioned letter. His arrival is vital to the whole opera as it spurs the Count on to further his enquiries when, prior to Figaro's interruption, he was quite willing to leave it be. In section three leading up to Figaro's entry, the fury of the Count, threatening to kill Cherubino, is quickly converted into a plea of forgiveness for doubting the Countess's honour. Susanna and the Countess play on this guilt briefly, chanting phrases like 'Le vostre follie non mertan pietà' ('Your wild accusations do not deserve to be pardoned'). As the trio between Susanna, the Count and the Countess draws to a close they sing together 'Da questo momento quest'alma a conoscerla apprender potrà' ('From this moment my/his [the Count's] heart will learn to know her/me [the Countess] better'). This would-be conclusion anticipates the state of closure for the whole opera at the end of act IV: the Count is tricked and pleads forgiveness. Figaro's entry into this very scene escalates the drama into confusion and chaos by giving the Count an opportunity to query the situation rather than leave it be. As such, one might say this point of DEMR is significant.

The positive point of Golden Section of the revised 870 bar finale is bar 537.[29] Once again, the point of DEMR is at one bar's proximity to the section change into Andante 6/8 at bar 605, where Figaro claims that it was he who jumped from the window in an attempt to conceal the fact that Cherubino still has not left for Seville.

The crucial aspect of these instances of DEMR is their proximity to section changes. The prospect of Golden Section in music has always been a point of contention regarding how this might be experienced by a listener. As outlined already, DEMR was conceived geometrically. It is a visual aesthetic, observed and appreciated for its relation to the whole. Music exists within an axis of time, which means one cannot experience 'the whole' (be it a phrase, movement or full opera) until it is complete. In turn, this implies that any significant 'experience' at the point of DEMR cannot be possible as it is not yet known what

29 Taking into account the 69 bars removed prior to the point this 'new' bar 537 can be found at bar 606 in the score.

the whole is. In relation to Mozart's *Figaro*, one could argue that these points are experienced—whether consciously or not—due to their convergence with a section change, which brings both a change of circumstance in the drama and a change of meter, tempo and often tonality.[30]Adopting this stance presents its own difficulties, however: Are the section changes which occur at a point of DEMR any more significant than the others in this finale? Also, while the point of DEMR can be plotted through counting bars, the very core of Mozart's finale is the build up and joining of micro scenes, each with its own tempo and metre, so the 'whole' is distorted by the constantly changing unit of measurement (one bar) across the nine discrete sections.[31] This could have two contrasting ramifications. One possible consequence of the imperceptible experience of time would be to conclude that no significant proportional relationship can be felt. Due to how Mozart and da Ponte plotted the act II finale, one might expect to 'lose track' of the 'bigger picture' through the unfolding of various interruptions from characters and twists in the plot. Better known examples of DEMR in music are typically found among works in which the metre and tempo are unchanged, enabling a correlation to exist between the bar of DEMR in the score and its durational sonic equivalent. Such a correlation in this finale would be truly extraordinary, though is unlikely. The alternative and contrasting possibility is that the section changes enhance the experience and force the listener to acknowledge the manipulation of time and proportion as a key dramatic feature of Mozart's act II finale of *Le nozze di Figaro*.

In the seventeenth and eighteenth centuries it was commonplace to plan the duration and proportions of a work using the bar as a fixed unit, regardless of any changes in metre and tempo.[32] In his *Sytagma musicum* (1619), Praetorius demonstrates this practice existed long before the 1600s and, as Tatlow shows, the method was still in use in the mid 1700s. Its usage is primarily relevant to the tradition of church music; composers would plan the duration of a work based on, for example, the requirements of a particular service or the time of year, and they would use a set number of bars to achieve this (400 bars for a longer

30 Perry-Camp, 'Time and Temporal Proportion', 136–137

31 Nine sections are considered here as the prospect of DEMR depends on the cutting of Section Five.

32 See Tatlow, *Bach's Numbers*, 116–120 for a detailed overview of this practice from Praetorius up to Bach's era.

work in the summer, 350 for a shorter one in the winter).[33] Particularly due to its association with church practices, it is quite possible that Mozart would have known of this method of measurement. Sacred music was a prime part of Mozart's compositional activities during his Salzburg years and such a method may have been a core tool in his temporal strategy. As such, it is incidental that the bars in these finales are a variable duration because they may have been conceived of as a fixed unit.

With Tatlow's detailed overview of DEMR, it would be very poor scholarship to claim that Mozart cut the 'Conoscete signor Figaro' section in order to allow certain section changes in the finale to correspond with DEMR. Tatlow's extensive research into contemporary dictionaries and other materials imply that, certainly within the musical community, DEMR was not a significant facet in eighteenth-century composition.[34] However, Euclid's division of extreme and mean ratio was well known amongst craftsmen. With its origins in stonemason guilds, Freemasonry attributes certain numbers and geometric ratios (including DEMR), with great significance.[35]

Mozart's association with Freemasonry is well known. In December of 1784 he was initiated as an Apprentice into the lodge *Zur Wohltätigkeit* ('Benevolence').[36] By January 1785, he had become Journeyman and was promoted to Master Mason 'shortly thereafter'.[37] Katherine Thomson describes the late-eighteenth-century Freemasons as 'closely-united men who, employing symbolical forms borrowed principally from the mason's trade and from architecture, work for the welfare of mankind'.[38] Freemasonry was primarily a product of the Enlightenment in which more rationalist and humanist beliefs were brought together. Though Masonic lodges often comprised a diverse range of individuals, *Zur Wohltätigkeit* was a relatively *bourgeois* lodge, members of which were leading intellectuals or part of

33 Ibid. 119

34 Tatlow, 'The Use and Abuse of Fibonacci Numbers and Golden Section in Musicology Today', 77

35 Perry-Camp dismisses the value of late eighteenth-century Viennese masonic sources because examples of DEMR pre-date Mozart's association with Freemasonry. 'Time and Temporal Proportion', 155

36 Thomson, 'Mozart and Freemasonry', 25–46

37 Solomon, *Mozart: A Life*, 321. The three degrees of Freemasonry (Apprentice, Journeyman, Master) appear to be consistent across the larger masonic community (reflective of its origin in craft guilds), though some Lodges seemingly offer more grades than just these three.

38 Thomson, 'Mozart and Freemasonry', 25

the Illuminati.[39] This was even more the case at *Zur wahren Eintracht* ('True Harmony'), another Viennese lodge which Mozart attended frequently.[40] While DEMR may not yet have been a widely known aesthetic quality, it seems likely that it would have been subject to dissemination by the Freemasons; a society for whom Euclid is regarded as 'immortal' for his writings on geometry, which is present in 'every mason's mind'.[41] Furthermore, this is a society that conceive of God as the 'Grand *Architect* of the Universe'.[42] The compass, which forms part of the Freemasons' symbol, is the very tool one would use to calculate DEMR. As Tatlow states in her case against Atlas's scholarship 'the golden section was indeed praised for its magical and divine qualities, but da Vinci and Pacioli found it through geometry, by means of compasses, and not through multiplication by a decimal'.[43] Nonetheless, eighteenth-century mathematicians were experimenting with numerical expressions of DEMR (which was termed the Fibonacci sequence in 1878 by Édouard Lucas).[44] Accounting for the circles in which Mozart was regularly associating, both as a notable member of the intellectual community of Vienna and as a Freemason, it is highly possible that he might have been exposed to the concept of DEMR as an aesthetic template for musical proportion. In addition to this, and even more crucially, Mozart's apparently advanced mathematical ability not only suggests that he would have been skilful enough to devise a method to apply this geometric ratio to music, using the bar instead of feet as his unit of measurement, but also that this might have appealed to his numerically-inclined mind.

A chance couple of occurrences of DEMR in the second act finale of *Le nozze di Figaro* cannot be the standard by which we assess the possibility of Mozart's application—intentional or not—of the so-called 'Golden Section'. For this prospect to be more convincing, one would expect there to be further examples of DEMR to assess. Putz puts forth 29 movements from the piano sonatas which adhere to DEMR, though he is adamant that these

39 Ibid. 27

40 Nettl, *Mozart and Masonry*, 13. This was the lodge Haydn was inducted into, and seemingly became Mozart's main lodge following Joseph II's decree to diminish the number of masonic lodges in Vienna.

41 Author unknown. Original source part of 'Short Bulletin Talk' 1934, series on Geometry and the Divine Ratio, Masonic Service Association of North America. Accessed online <http://www.masonicdictionary.com/geometry.html> on 17 September 2016

42 Ibid.

43 Tatlow, 'The Use and Abuse of Fibonacci Numbers and Golden Section in Musicology Today', 70

44 Ibid. 77

are not examples of DEMR. He suggests that, in order for a Golden Section to occur, it must satisfy the ratio of $a — b$ in addition to $b \div (a + b)$.[45] Setting out his data statistically, he concludes that (on average) the latter ratio occurs 99% of the time, while the former only 93%, and therefore Mozart cannot have used Golden Section in his piano sonatas.[46] I take issue with this analysis. His assessment is based on averages, taking a statistical trajectory and barely accommodating a very small margin of variability within that. Effectively, Putz disregards the concept that Golden Section (DEMR) is primarily an *aesthetic* division of property. In short, I believe this is not something which can only be dealt with in exact terms, and certainly not with an accuracy percentage chart.

Further evidence of this type of proportionality can be observed in the act II finale and other chain finales by Mozart. Graphical examples of these are presented in appendix 2. If the division of the whole at points of DEMR builds an aesthetically attractive proportional quality, what about divisions of other dimensions within the whole? Might these points of division seem equally compelling if they coincide with a section change, as in the case of the two instances already mentioned? Working in whole numbers, we have established both the negative and positive points of DEMR in act II. As anybody familiar with DEMR might expect, the negative point of 870 (332) is also the positive point of 537 as a smaller whole.[47] Continuing with this reasoning, one could expect there to be another section change at the 'nested' negative DEMR of the 'whole' negative DEMR. This is exactly what occurs at bar 126, the beginning of section two, which becomes the negative point of DEMR from the beginning up until bar 332 (see appendix 2, example F). This section change heightens the Count's (and indeed the Countess's) shock as Susanna emerges from the cupboard. Having locked the doors and remaining at the Countess's side, the Count was adamant that this was his opportunity to catch Cherubino red-handed. This feature of DEMR within DEMR is highly intriguing, though it is not mirrored in the second half of the finale (as positive points of DEMR). This may possibly detract from the importance of the second point of

45 Putz, 'The Golden Section and the Piano Sonatas of Mozart', 277
46 Ibid.
47 $537 \times 0.618 = 331.866$

DEMR (537) and add to the first. Regardless, Susanna's entry at 126 anticipates Figaro's entry at a point of DEMR in bar 332. I will offer my thoughts on this particular relation in my conclusion.

In extending the musical durations to dimensions outwith the whole, further instances of DEMR are uncovered in both the finales. These are found by considering two halves of each finale and establishing the DEMR of the half. It must be acknowledged, however, that there are no section changes at the mid-way point in either finale. As such, I offer these further instances as mere curiosities rather than as evidence.

If the act II finale is considered in two halves of 435 bars each, the first half of the finale has its own point of DEMR at bar 166, the very moment of transition from the second to third sections of the finale. As with the embedded instance of DEMR mentioned above, there is no further mirror of this in the latter half of the finale. (See appendix 2, example G)

The act IV finale, as a whole, does not divide at points of DEMR. Though, similarly to the instance at bar 166 of act II above, there is one instance where DEMR occurs at an important section change. Taking the 521 bars of the act IV finale and dividing by two (260.5), the point of DEMR in the second half of the finale occurs at bar 421, the beginning of the Andante section.[48] This section change marks the very moment the whole opera has been catapulting towards: the moment of realisation for the Count that he has been outwitted and too involved in his own agenda. His final option is to right the wrongs established throughout the plot and plead for forgiveness from the Countess. It is fitting that this final occurrence of DEMR in *Figaro* should correlate to the negative DEMR of act II which, as stated above, very nearly anticipates this moment of peace between the Count and Countess. (See appendix 2, example H)

Further examples of DEMR exist outwith *Le nozze di Figaro* too and are presented in appendix 2. The most striking example is in the act I finale of *Don Giovanni*.

48 $((521 \div 2) \times 0.618) + (521 \div 2) = 421.489$

### 3.3 — Conclusion

Tatlow claims that she wrote her paper 'in the hope that it will contribute to halting the perpetuation of such misconceptions, and even stimulate new and historically-accurate studies of this aesthetically-intriguing phenomenon'.[49] By way of offering a conclusion, I will end this chapter with a reflection on my findings.

One is inevitably curious as to why Mozart would cut section five from the act II finale. This chapter presents an outcome, but not necessarily a motive. Evidence might yet come to light which would explain this, though that does not mean to say it would render the outcome of DEMR as invalid. According to Tatlow's broad survey of music-related literature, Mozart could not have known of this proportion or conceived of it as significant. This I do not question. Taking Tatlow's lead in attempting to 'stimulate new and historically-accurate' studies of DEMR in music, however, I present the following considerations: First, given the strong symbolic regard with which Freemasons hold geometry, one cannot rule out that Mozart might have been exposed to this proportion as an active Freemason himself. Second, a much more thorough investigation into symbolism in the late eighteenth-century masonic community needs to take place in order to further this line of enquiry. Because of the edict issued by Joseph II in 1785, we know who was meeting and when,[50] but primary sources concerning the dissemination of masonic symbolism in Mozart's Vienna are somewhat limited. More information on this could confirm whether or not Mozart might have been introduced to the concept of DEMR.

Based on the evidence we have, it is likely Mozart was completely unaware of DEMR. This would render its presence in the act II finale a complete fluke. This in itself is significant as it demonstrates a natural, unconscious inclination towards a proportion which in various forms of art was aesthetically iconic and which would later populate proportionality in western music. Supposing Mozart was aware of DEMR, is it likely that he would decide to apply the proportion in his music? Given his apparent fluency with mathematical problems

49 Tatlow, 'The Use and Abuse of Fibonacci Numbers and Golden Section in Musicology Today', 70
50 Thomson, 'Mozart and Freemasonry', 27

and the established practice of using a bar as a unit of measurement, the possibility is there but again, where is the motive? Once more, my observations relate to Freemasonry.

Taking the two principal points of DEMR in the act II finale (bars 332 and 537), the first bears greater significance in the plot of the opera than the second. Figaro's entry disperses the quasi-resolution between the Count and the Countess, plummeting the scenario back into confusion and mistrust. This DEMR (332) marks Figaro's entry and changes the metre from **𝐂** to 3/8. Furthermore, the point at which DEMR is nested within the first principal point (126 within 332) marks Susanna's entry and also changes the metre from **𝐂** to 3/8. This metre is not used on any other occasion in *Le nozze di Figaro* and its usage is uncommon in Mozart's output. Therefore, it may be significant that the entries of both Susanna and Figaro are marked by a point of DEMR and a change to 3/8. Three is a number of particular importance in masonry,[51] so perhaps Mozart was bestowing a masonic message on Susanna's and Figaro's entry by using 3/8 metre and DEMR, commenting that the servants' relationship is deeper, stronger and purer than that of the feuding nobles'. This we will never know for sure. Regardless, I feel this beckons further exploration.

Returning to the quotations which open this chapter, I believe that Mozart's potential use of DEMR in the finale of act II *is* more audible than Davies's use of knitting patterns. Due to its convergence with changes in tempo and metre, the listener experiences a transformation in the way they are engaged with time, whether they are consciously aware of it or not. That does not mean to say that one realises *what* it is. This may be the point; it is a subliminal, clandestine idea. Supposing this is indeed the case, I would argue that it is significantly more profound than Davies's use of knitting patterns. One is a structural blueprint, the other is a message and symbol.

Breidenstein's unequivocal dismissal of significant proportions in Mozart's music epitomises why there is such a dearth of scholarly writing on the subject. Arising from Mozart's affiliation with Freemasonry, it is apparent that there are still avenues of DEMR-related research yet to be explored which remain rooted in 'historical accuracy'. Through this chapter I have

51 Ibid. 29

aspired to demonstrate that such proportionality may have been central to Mozart's control and manipulation of time and that—though we might never reach a conclusion—surely there is much to be gained in reopening this area of scholarly discourse on Mozart's music.

## An inconclusive conclusion

Through the course of this dissertation the two chain finales of Mozart's *Le nozze di Figaro* have been subject to examination from a multitude of perspectives. In this final chapter I will assess the implications of my research and suggest ways forward. The title of this conclusion may at first seem superficially defeatist, though this should hardly come as such a surprise to the reader. It has never been the aim of this work to present a grand, definitive take on the tempo indications of Mozart, nor to prove the presence of proportion. Rather, my ambition has been to present possibilities which may be useful as one approaches these volatile finales. The goal of this thesis has been to reposition eighteenth-century music theory and a re-evaluation of Mozart's possible environment at the centre of considerations, both of which—even in this era of historically informed performance—I feel have been significantly overlooked in recent years of performance practice.

The studies of tempo and proportion have been achieved through very different methods: one relies heavily on eighteenth-century music theory while the other requires a more expansive survey of what I call Mozart's intellectual curiosities, his interest in number theory, for example. Exploring these two elements exposes a dialogue between the external, phenomenological qualities of these finales, i.e. what the listener experiences, and their internal clandestine qualities, i.e. the composer's possible hidden use of DEMR. Both contribute to furthering our understanding of how Mozart manipulates our perception of time in order to signify certain events.

By reviewing treatises concerning tempo and metre by Quantz, Kirnberger and Koch, it is evident that Mozart did not have a governing system in mind while composing these finales. Despite this, each theory and method illuminates its own take of the ingredients of the late eighteenth-century musical *milieu*. Quantz provides a valuable starting point through which one can establish tempo using the human pulse. Kirnberger presents us with the concept of *tempo giusto*, an inherent and intuitive tempo associated with the combination of metre and rhythm. Koch's incipient theory then indicates that *tempo giusto* might have been superseded, introducing a more familiar and modern take on metre which is

less reliant on pre-existing metric inflection. From this I conclude that the late eighteenth century was a dynamic period in the practice of and theorisation about tempo and metre, and that the way Mozart uses tempo and metre in *Le nozze di Figaro* are a product of this tangible shift. Arising from this study is the possibility that Mozart exercises a much more elegant and considered approach to his use of metre and tempo, one which captures retrospective aspects of eighteenth-century music theory while also demonstrating progressive qualities.

Taking this more sophisticated application of metre and tempo in tandem with the possibility of proportional planning and DEMR, I suggest that the manipulation of the perception of time was a key consideration for Mozart, but how do these two elements come together? In a basic sense, the suggestion made by a number of composers and theorists that, while experiencing music, one occupies a 'virtual' time which leaves 'actual' time unobserved, is a useful starting point.[1] Perry-Camp draws the comparison between 'virtual' time in music and 'virtual' space in a painting; measuring the inches of a canvas is not necessary in order to experience the 'virtual' space occupied by a painting.[2] Extending this notion, one could argue it is no more important that we are aware of proportionality than we are of, say, harmony for us to experience it. With this view, I suggest that tempo and proportion are complementary facets of Mozart's use of time. Like the notion of *thesis* and *arsis* in the human pulse, tempo and proportion are separable and yet they constitute one element. Through this thesis, I present the possibility that this 'one thing' exists through both introvert and extrovert qualities.

I would like to conclude by offering are a number of observations regarding Mozart's temporal strategies.

The evidence which suggests that the 'Conoscete signor Figaro' section was cut from the second act finale in the original 1786 production of *Le nozze di Figaro* is compelling. Despite this, there is not a shred of documentation to illuminate why this might have been the case.

1 Perry-Camp, 'Time and Temporal Proportion', 136. See endnote 6 for a list of individuals who have asserted similar notions.

2 Ibid.

This dissertation presents one possible reason, but one has to consider that—regardless of DEMR—in making this cut Mozart was consciously altering the dramatic shape of the finale. This cut renders the finale more 'Allegro-heavy' and, as a result, makes the deliberation of how to grade these quicker tempos even more necessary. In this sense, tempo is intrinsically linked with the temporal proportionality of each section.

If DEMR was an aspect of Mozart's temporal strategy, why does it feature so heavily in the act II finale and not in the act IV finale? Surely such a significant proportional presence would be better suited to the dramatic conclusion of *Le nozze di Figaro*, with its theme of love and forgiveness? Appendix 2 illustrates further instances of DEMR in Mozart's chain finales. It is particularly interesting that, as in the case of *Figaro*, it is the central finale rather than the concluding finale which features DEMR more prominently, most notably in *Don Giovanni*, which demands its own research entirely. This does not prove that Mozart was consciously aware of what he was doing. Instead it suggests that, however Mozart conceived of the sectional proportions of these finales, there must have been some form of subconscious instinct which drew him to this aesthetic divide. This in itself is an exciting and stimulating possibility. As the ideal of Kant says; 'a work of genius is perfectly natural'.[3]

Finally, I present a tenuous possibility, which I stress does *not* form the basis of my conclusions, but rather strengthens the thesis that Mozart's use of tempo and proportion forms a significant part of his temporal strategy and furthers my call for additional critical inquiry.

The points of DEMR occur at bars 332 and 537 (bar 606 in the score) which are each at very close proximity (within 1–3 bars) to the beginnings of sections four and seven respectively. One would look for the durational occurrence of DEMR at the same point in order to see whether a connection exists between the choice of tempo and how they present proportion. Following the tempos established through the methods of Quantz and Kirnberger, this does not happen. The durational occurrences of DEMR are at 8 minutes 52

3 Perry-Camp, 'Time and Temporal Proportion', 162

seconds (negative) and 14 minutes 21 seconds (positive). This places both squarely in the middle of sections three and six and nowhere near to the section changes.

Adopting quicker tempos for sections one, three and six, in light of Mozart's use of the minim as the pulse rather than the crotchet in Allegro **C** as well as Koch's theory of *Takteille* (chapter 2.5), brings the durational and numeric points of DEMR closer to alignment. The revised tempos stem from the theories used and the tempos reached in part 2.2: Using the 'mean' between 108 crotchets and minims per minute yields a new Allegro tempo of 81 minims per minute. In order not to surpass the tempo of the Allegro molto, this is adjusted to 90 minims per minute which pre-empts the closing tempo of 90 semibreves per minute. The new durational points of DEMR would occur at 7 minutes 14 seconds and 11 minutes 42 minutes. (See tables 2 and 3 below.) Once again, the timings do not fall on the desired tempo changes and the nested DEMR of bar 126 is nowhere near its durational equivalent. Nonetheless, the new durational layout of the two principal instances of DEMR is particularly striking.

| Sections | Tempo / Metre | BPM | Time | Cumulative Time |
|---|---|---|---|---|
| 1 | Allegro / **C** | 𝅗𝅥 = 108 | 4'36" | - |
| 2 | Molto andante / 3/8 | 𝅗𝅥. = 54 | 0'45" | 4'36" |
| 3 | Allegro / **C** | 𝅗𝅥 = 108 | 6' | 5'22" |
| 4 | Allegro / 3/8 | 𝅗𝅥. = 54 | 0'58" | 11'22" |
| 6 | Allegro molto | 𝅗𝅥 = 72 | 3'49" | 12'20" |
| 7 | Andante / 6/8 | 𝅗𝅥. = 54 | 3'24" | 16'09" |
| 8 | Allegro assai / **C** | 𝅗𝅥 = 108 | 1'35" | 19'33 |
| 9 | Più allegro / **C** | 𝅗𝅥 = 144 | 1'43" | 21'08" |
| 10 | Prestissimo / **C** | 𝅝 = 90 | 0'21" | 22'51" |
| | **Finish:** | | | **23'12"** |

**Table 2**: Tempos and durations from chapter 2.2

| Sections | Tempo / Metre | BPM | Time | Cumulative Time |
|---|---|---|---|---|
| 1 | Allegro / **c** | 𝅗𝅥 = 81 | 3'05" | - |
| 2 | Molto andante / 3/8 | ♩. = 54 | 0'45" | 3'05" |
| 3 | Allegro / **c** | 𝅗𝅥 = 81 | 3'58" | 3'50" |
| 4 | Allegro / 3/8 | ♩. = 72 | 0'58" | 7'48" |
| 6 | Allegro molto | 𝅗𝅥 = 90 | 3'04" | 8'46" |
| 7 | Andante / 6/8 | ♩. = 54 | 3'24" | 11'52" |
| 8 | Allegro assai / **c** | 𝅗𝅥 = 108 | 1'35" | 15'16" |
| 9 | Più allegro / **c** | 𝅗𝅥 = 144 | 1'43" | 16'52" |
| 10 | Prestissimo / **c** | 𝅗𝅥 = 90 | 0'21" | 18'35" |
| | **Finish:** | | | **18'57"** |

**Table 3**: Tempos and durations with minim Allegros

It is through mutual enhancement and the opening of possibilities that the two strands of my research are able to coalesce. The amalgamation of the theories and methods of Quantz, Kirnberger and Koch sets out the prospect that in some cases Mozart utilises pre-existing metric patterns and conforms to established eighteenth-century music theory, while in other instances he requires a more malleable strategy of metre. As already demonstrated, the synthesis of the three music theories could facilitate the otherwise hidden proportional relations to come to the surface.

My research poses more questions than answers. In conclusion, I make one final assertion: Mozart's use of time—his temporal strategy—was clearly a central part of his compositional method and that further research may increase our understanding of this incredible man and his music.

# Appendix 1

Deutsch's *Mozart: A Documentary Biography* and Töpelmann's recent thesis both indicate that Mozart did not own anything relating to tempo and metric theory at his death in 1791. However, both suggest that the Mozart family owned Giovenale Sacchi's *Della divisione del tempo nella musica nel ballo e nella poesia*, published in Milan in 1770.[1] This particular volume is now extant in the Euing Collection in the Special Collections department at the library of the University of Glasgow, and which I examined as part of my research. The signature 'Mozart mpia' (mpia being contracted from 'manu propria', meaning 'by my own hand') features at the foot of the title page. Upon examining this volume in person, it was clear that the signature was not that of Mozart's usual signature. As the University of Glasgow's Special Collections department have not yet had this signature verified, I obtained permission to consult with Cliff Eisen, Simon Keefe and Dexter Edge, leading Mozart scholars who are familiar with the composer's manuscripts. Both Eisen and Keefe recognised this signature as that of Leopold's. Edge also suggested this was likely, though felt it could still be Wolfgang's on the basis that it is not wholly consistent with Leopold's signature. Looking for similarly dated signatures from both Wolfgang and Leopold is surprisingly difficult without access to original sources. The ongoing online Digital Mozart Edition provides the complete correspondence reproduced in text and, in most cases, with an accompanying facsimile. Leopold's typical sign-off was 'Mzt mpa' and example facsimiles where full name signatures appear in this period are currently limited online. Nonetheless, similarities can be drawn with a number of signatures by both Leopold and Wolfgang from their time in Italy in 1770. Examples 9a–g demonstrate the range of similarities and differences across a number of sources dated around 1770.

Examples 9b and 9d bear the closest resemblence, reinforcing Eisen's and Keefe's hypothesis that it is likely to be Leopold's signature on the Sacchi volume, as he was the author of this particular letter on 1 December 1770. The main inconsistency Edge refers to is the treatment of the letter 'z', which typically features a low swoop and bar as seen

1 See Deutsch, *Mozart: A Documentary Biography*, 604, Töpelmann, *The Mozart Family and* Empfindsamkeit, 120

in examples 9e and 9g. One can see through comparison of examples 9d and 9e that this treatment of the letter 'z' differs in the word 'Salzbourg' as well as the family name. These examples share the same wording for the addressee, so direct comparison is well facilitated. One can see that the pen travel for certain characters ('A', 'M', 'd' in particular) is near identical between the two examples, dated a year apart, so we can reasonably credit Leopold with both of these as the main correspondent on both occasions. The 'z' may have been a character Leopold penned differently on occasion. The most striking difference between the Sacchi signature and examples 9d and 9e is in how the 'rt' is drawn. In the former, the pen travel from the 'r' goes upward to commence the downward strike for 't', but the placement of the bar is lower than the join between the two letters. In the latter examples, the bar is placed above this join. With the exception of the 'z', this orthographic detail makes the Sacchi signature almost identical to that of Leopold's signature in 1764 (example 9g). In his correspondence, Edge suggests that the signature on the Sacchi volume may have been written in an italic style of handwriting, as opposed to the usual German *Kurrentschrift*, in which the 'z' would be the most obviously different.[2] Given the context being explored, with two German speakers in Italy, it is quite possible that this may have been the case. This could offer explanation for the discrepencies observed in this very small range of samples. However, further confusion is caused through example 9f, which is a reproduction of the first page of Mozart's *La Betulia liberata* K.118 of 1771. The signature here also closely resembles that of the one on Sacchi's *Della divisione del tempo nella musica* (the main difference being the 't'). This particular manuscipt was credited to Wolfgang by Nissen in the early nineteenth century, an identification which has remained unchallenged to this day. Immediately one can see that the 'A' and 'd' of 'Amadeo' are very different to those of Leopold's in examples 9d and 9e. However, the arching curve of the 'd' of 'di' which preceedes the composer's credit is more similar to those seen in examples 9d and 9e. However, one hardly has to look far in Mozart's mature handwriting to see that he liberally uses both the straight vertical 'd' and the arching 'd' quite randomly.[3] Taking Edge's theory that italic handwriting may have been employed on occasion, it is quite possible that the Sacchi signature could easily have been either Leopold or Wolfgang, as these samples are

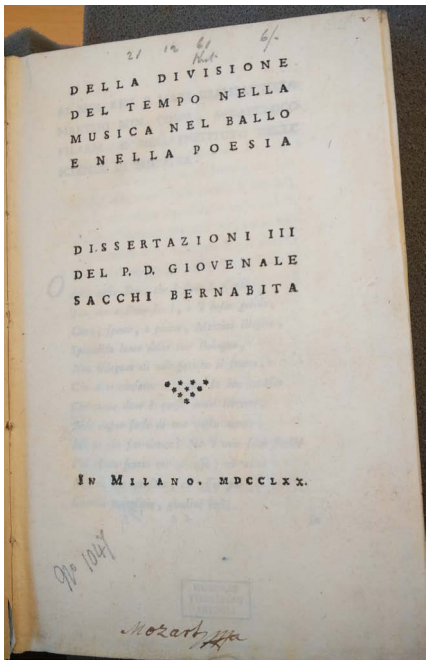
2 Edge, personal correspondence

3 See *Mozart's Thematic Catalog: A facsimile*, f.3, f.4, f.9, for example

much more similar to each other than their *Kurrentschrift* alternatives are (see example 9c for Wolfgang's 1770 signature in *Kurrentschrift*, which differs greatly to that identified by Nissen on *La Betulia liberata*).

Such orthographic examinations are useful in attempting to indicate whether the *Della divisione del tempo nella musica* was Leopold's or Wolfgang's. As noted, Leopold's interests in matters of music theory and practice are more evident than that of his son's. The family correspondence and documentary investigations by Deutsch and Töpelmann demonstrate that it was common for Leopold to obtain books of this sort. To an extent, he was a collector. However, one cannot assess how long this may have remained in the Mozart estate (whether Leopold's or Wolfgang's), nor how it came to be in the Euing Collection. Töpelmann supposes that the Mozarts met Sacchi in Milan in 1770, where he was professor at the Collegio dei Nobili.[4] It is also quite possible that the Mozarts came to this book through Padre Martini (Giovanni Battista) who was the dedicatee of *Della divisione del tempo nella musica* and who tutored Mozart in counterpoint in 1770. As asserted in the body text of my dissertation, I believe this was obtained for posterity due to its reference to Mozart and his talents rather than for any theoretical gain. See examples 10a and 10b for the citation of Mozart.

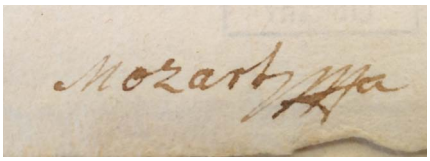
4 Töpelmann, *The Mozart Family and* Empfindsamkeit, 120


DELLA DIVISIONE
DEL TEMPO NELLA
MUSICA NEL BALLO
E NELLA POESIA

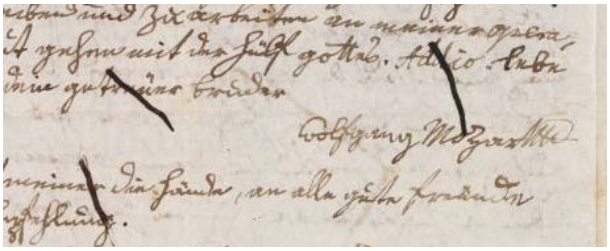
DISSERTAZIONI III
DEL P. D. GIOVENALE
SACCHI BERNABITA

IN MILANO. MDCCLXX.

**Example 9a**: Title page of Sacchi's book (Sp Coll F.c. 26)



**Example 9b**: Close up of signature (Sp Coll F.c. 26)



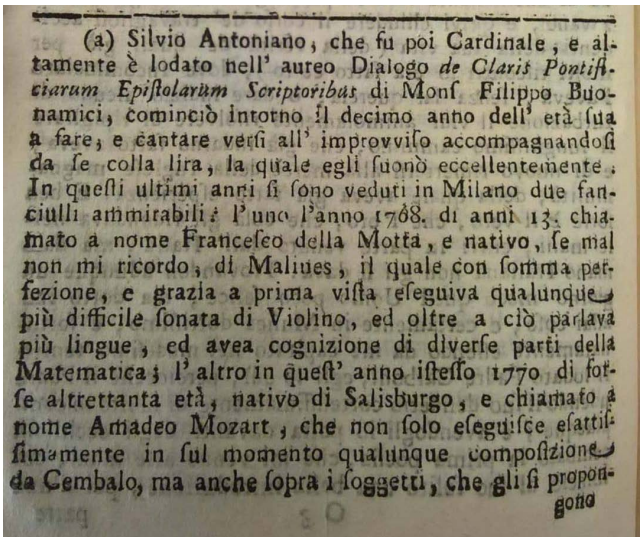
**Example 9c**: Wolfgang's signature in a postscript on a letter from Leopold to Maria Anna and Anna Maria. 1 December 1770


**Example 9d**: Seal and address. 1 December 1770


**Example 9e**: Seal and address. 14 December 1769

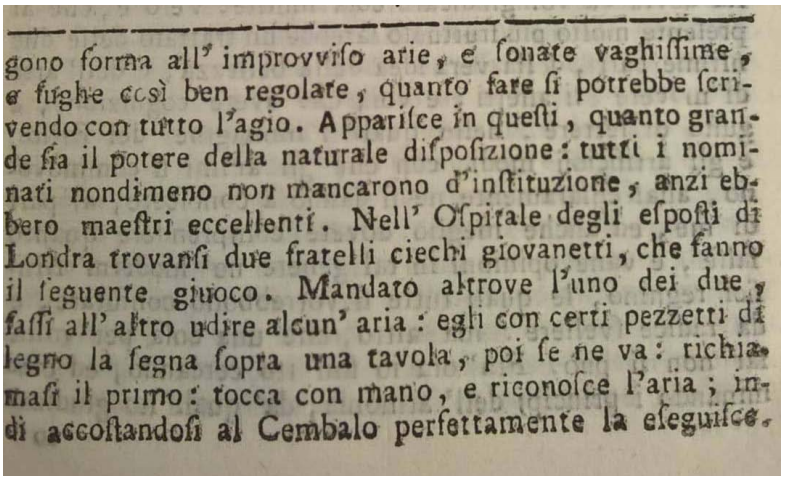
**Example 9f**: Mozart's signature on the opening page of *La Betulia liberata* (1771)

**Example 9g**: Leopold's signature on the final page of a published collection of Wolfgang's first keyboard and violin works, K.6&7 (1764)



(a) Silvio Antoniano, che fu poi Cardinale, e altamente è lodato nell' aureo Dialogo *de Claris Pontificiarum Epistolarum Scriptoribus* di Monſ. Filippo Buonamici, cominciò intorno il decimo anno dell' età ſua a fare, e cantare verſi all' improvviſo accompagnandoſi da ſe colla lira, la quale egli ſuonò eccellentemente. In queſti ultimi anni ſi ſono veduti in Milano due fanciulli ammirabili: l'uno l'anno 1768. di anni 13. chiamato a nome Franceſco della Motta, e nativo, ſe mal non mi ricordo, di Maliues, il quale con ſomma perfezione, e grazia a prima viſta eſeguiva qualunque più difficile ſonata di Violino, ed oltre a ciò parlava più lingue, ed avea cognizione di diverſe parti della Matematica; l'altro in queſt' anno iſteſſo 1770 di forſe altrettanta età, nativo di Salisburgo, e chiamato a nome Amadeo Mozart, che non ſolo eſeguiſce eſattiſſimamente in ſul momento qualunque compoſizione da Cembalo, ma anche ſopra i ſoggetti, che gli ſi propongono

**Example 10a**: Sacchi, page 214 (Sp Coll F.c. 26)



gono forma all' improvviſo arie, e ſonate vaghiſſime, e fughe così ben regolate, quanto fare ſi potrebbe ſcrivendo con tutto l'agio. Appariſce in queſti, quanto grande ſia il potere della naturale diſpoſizione: tutti i nominati nondimeno non mancarono d'inſtituzione, anzi ebbero maeſtri eccellenti. Nell' Oſpitale degli eſpoſti di Londra trovanſi due fratelli ciechi giovanetti, che fanno il ſeguente giuoco. Mandato altrove l'uno dei due, faſſi all' altro udire alcun' aria: egli con certi pezzetti di legno la ſegna ſopra una tavola, poi ſe ne va: richiamaſi il primo: tocca con mano, e riconoſce l'aria; indi accoſtandoſi al Cembalo perfettamente la eſeguiſce.

**Example 10b**: Sacchi, page 215 (Sp Coll F.c. 26)

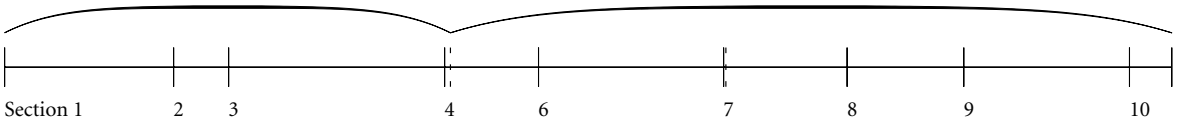
POSTSCRIPT: FEBRUARY 2018

The findings in this appendix contributed towards an entry in *Mozart: New Documents* about this Sacchi volume by David Black and Dexter Edge. This can be read here:

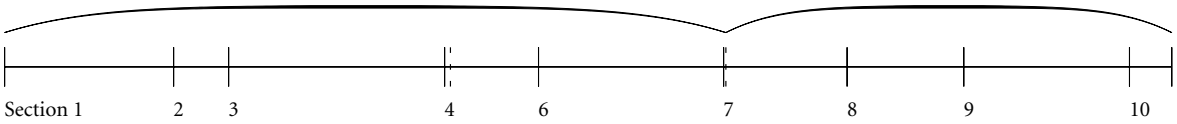
https://sites.google.com/site/mozartdocuments/documents/1770-sacchi

# Appendix 2

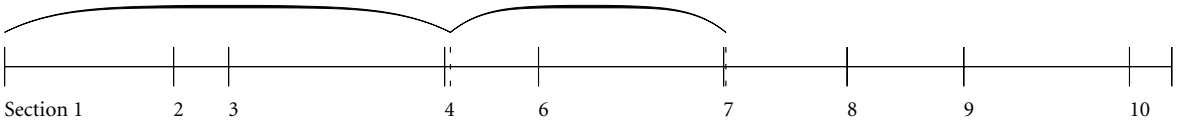

**Example A:** *Le nozze di Figaro* act II finale, 939 bars and no DEMR convergence



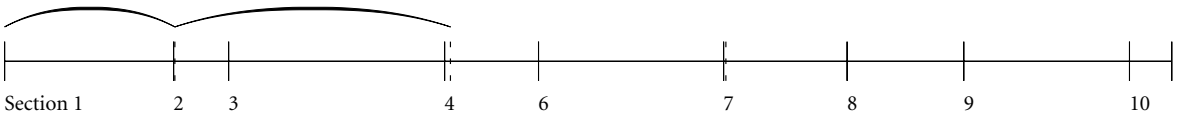

**Example B:** *Le nozze di Figaro* act II finale, 870 bars, possible negative DEMR



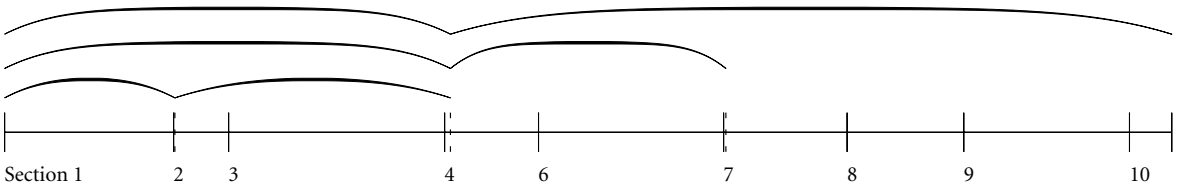

**Example C:** *Le nozze di Figaro* act II finale, 870 bars, possible positive DEMR



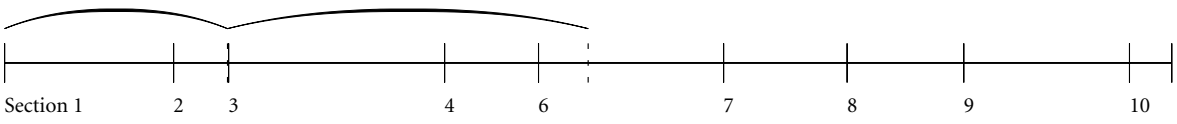

**Example D:** *Le nozze di Figaro* act II finale, 870 bars, DEMR within DEMR



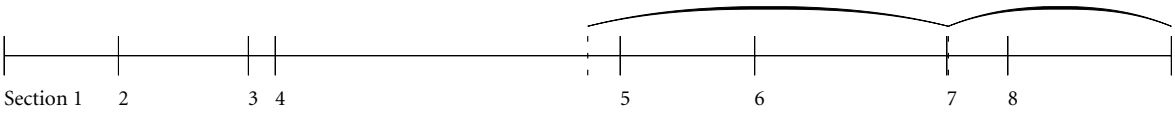

**Example E:** *Le nozze di Figaro* act II finale, 870 bars, 'nested' DEMR



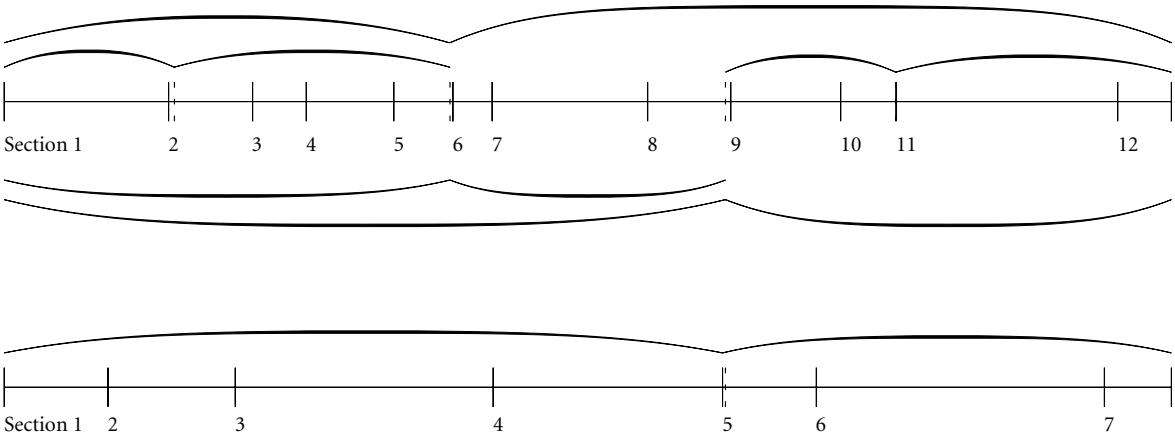

**Example F:** *Le nozze di Figaro* act II finale, 870 bars, all DEMRS



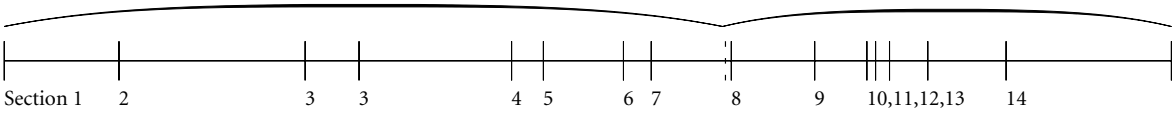

**Example G:** *Le nozze di Figaro* act II finale, 870 bars, DEMR of the half




**Example H:** *Le nozze di Figaro* act IV finale, 521 bars, DEMR of the half




**Example J:** *Così fan tutte* act I finale, 697 bars, single DEMR




**Example K:** *Così fan tutte* act II finale, 671 bars, single DEMR

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