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Mission Statement

The College Orchestra Directors Association is dedicated to the promotion and advancement of college and university orchestra programs through the collaborative assistance, insights, knowledge, creativity, resources and shared vision of its members.

CODA champions the art of teaching and performing orchestral music and strives to encourage and support the artistic, professional and personal growth of college orchestra directors and their students.

The association serves as an advocate for the crucial dual roles of the orchestra in the higher education community; namely, providing an essential component in the development of educated students of all majors, and refining the vocational and personal skills required of those preparing for various careers in music and other disciplines.
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President:

Dear CODA Colleagues,

I am thrilled to announce Volume XI of the CODA Journal! The Journal, established in 2007, is the only peer-reviewed publication specifically geared toward the college orchestra conductor. You will find that it is chock-full of insightful, well-written topics of interest to you. The Journal’s success is really a microcosm of CODA’s increasing reach and relevancy in the academic world of orchestra conducting - we just reached 300 members! More and more of our colleagues are discovering that CODA is essential to what they do.

I would like to introduce our wonderful new editor, Christopher Dobbins, from Washington and Lee University. Christopher brings a wealth of experience and passion for the conducting profession, especially the research side of things. He and his assistant editors have put together a stellar volume filled with rigorous research by our members. I hope you will read it.

Please circle February 7-9, 2019 on your calendars for our next CODA National Conference in Boston, co-hosted by Boston Conservatory at Berklee and Massachusetts Institute of Technology. Highlights include a concert by Boston Symphony Orchestra and Andris Nelsons, as well a keynote speech by Peter Schickele. It promises to be another informative and inspiring conference. Come join us...and tell your friends!

All the best,

Joel Neves, CODA President

Editor:

Greetings, CODA Members!

It is my pleasure to pen my first note to you as editor of the CODA Journal. It was an honor to be asked to follow in Jon Mitchell’s footsteps and to build upon what he began and nourished over ten years ago! There are many exciting changes afoot that will eventually include such perks as a searchable index and searchable journal articles, active hyperlinks, a more open formatting and style, and much more!

Thanks to all who submitted their scholarly work for this volume, and congratulations to Travis Jürgens, Marguerite Richardson, Luis Vizquez, and Benjamin Bergey for having their work selected. I would be remiss if I didn’t thank our wonderful editorial team, Matthew Brooks and David Kozamchak for their help in reviewing articles, helping with editorial problems, and just generally providing great support!

Be on the lookout for our call for submissions shortly after the first of the year, as well as be aware of our new submission deadline of June 1. We’re hoping that a submission date
following the spring semester will better enable more members to use their “free” time (as if there is such a thing!) to finish up articles and get them submitted. We’ll then publish new volumes in mid-August to help begin the excitement of the new academic year!

I hope you enjoy this volume, full of wonderful and varied articles by our contributors. Each article contains new information and ideas as well as plenty of excitement to start your academic year off right!

Kind regards as you begin your academic years,

Chris Dobbins, Editor
The Genesis of Gustav Mahler’s Third Symphony and the Inspirations of Nature, Philosophy, and God

Gustav Mahler’s Symphony No. 3 in D Minor has a diverse origin, but is mostly inspired by God, nature, bird songs, and philosophy. The purpose of this article is to describe the genesis of the work through many different quotes and explore Mahler’s philosophical influences. Mahler uses many quotations of other works, art songs, and allusions to bird songs as an expressive device in this symphony to send strong messages about life’s problems and struggles. The first performances and publications along with the reception of Mahler’s works will also be discussed.

Some background information is required before exploring this enormous work. Mahler was primarily a conductor and composed music on the side during his free summers. He had a number of small composing huts (or one-room buildings) he would live in during the summers. These huts were in rural areas and they served as retreats for him to dwell in nature and compose. His first important position was the Chief Conductor of the National Theatre in Prague for the 1885-86 season. Later he served as the conductor for the Vienna Court Opera around the turn of the century. He was a controversial character because he re-orchestrated and revised works for performances including Beethoven’s Symphony No. 9 in D Minor, Op. 125. Training for the art of conducting did not exist at the time, so Mahler was a self-trained conductor. His coursework at the Gesellschaft der Musikfreunde included counterpoint,
harmony, composition, and score-reading. However, he rebelled against the rigidly taught harmony and counterpoint classes.¹

Mahler first wrote the finale of Symphony No. 3 in D Minor in 1892, composed movements two through six in 1895 with references to the finale, and finished the first movement in 1896. After writing all of this he found that it would have been too long, so he decided to cut the finale and use it later. It became the finale to his Symphony No. 4 in G Major.

Mahler’s Symphony No. 3 in D Minor was partially performed twice before the entire work was premiered. The second movement was performed in Berlin on the 9th of November 1896, and movements two, three, and six were later premiered in Berlin on the 9th of March 1897. The full premier took place in Krefeld, Germany on the 9th of June 1902. The version used for this performance was published in Vienna in 1899. Later it was revised and republished in 1906.²

Mahler’s original program for this symphony was as follows:

1. Summer marches in
2. What the flowers in the meadow tell me
3. What the animals in the forest tell me
4. What the night tells me (the man)
5. What the morning bells tell me (the angels)
6. What love tells me
7. What the child tells me³

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After Mahler decided to leave off the last movement he changed the programmatic titles to the following:

- **Introduction: Pan Awakens**
- 1. Summer Marches In (Bacchus Procession)
- 2. What the Flowers in the Meadow Tell Me
- 3. What the Animals in the Forest Tell Me
- 4. What Humanity Tells Me (the Night)
- 5. What the Angels Tell Me (Morning Bells)
- 6. What Love Tells Me (God)\(^4\)

Mahler intended a progression from the ground up – from Earth to God. He shows this through his titles and also his use of the voice and song. It progresses from no voice in the beginning until movement four, when a solo voice enters as the voice of Humanity. Movement five has a children’s choir as the voice of the angels, and the final movement has no human voice. Perhaps Mahler intended this movement to be the voice of God, which he decided to depict by the sum of the parts of the orchestra. This sound has a wider variety of complex layers than a single human voice. Indeed, he may have intended this movement to sound like God’s complex depth of love, as shown through Christ’s sacrifice on the cross. The symphony also depicts a progression of philosophies – from the Schopenhauerian concept of the Will, to Darwin’s evolution theory, to Nietzsche’s view of Man, and finally to the love of Christ’s sacrifice.

Mahler’s conversion to Catholicism from ethnic Judaism officially took place on the 23\(^{rd}\) of February, 1897, which is shortly after this piece was written.\(^5\) However, religious conversions do not suddenly take place in a single day, and it is likely that the process of

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writing this symphony played a part in his conversion. The concept of the symphony requires much thought about the order of the universe, philosophy, and religion. Mahler was a very independent thinker, and ended up with a very eclectic worldview. He did not like the dogma of Catholicism, but he preferred to take important ideas with him rather than mechanical liturgies. He was an ethnic Jew, and unfortunately, anti-Semitism existed in Vienna at the time. Therefore, some believe that he converted to Catholicism to enable his appointment to director of the Vienna Hofoper. One may question the sincerity of Mahler’s faith, however, the sincerity of his faith is expressed through his music and the choice of themes for his symphonies. Mahler, himself, said the following regarding sincerity, artificiality, and art:

Natalie Bauer-Lechner recounted a conversation about honesty of expression during the summer of 1896 during which Mahler states: "Erst viel später bin ich zur vollen Wahrheit, Einfachheit und Schlichtheit durchgedrungen und habe erkannt, daß nur in dem ganz und gar Ungekiinstelten die echte Kunst zu finden ist," NBL, p.56; ("Only much later did I find my way to complete truth, simplicity and economy. Then I realized that genuine art is to be found only in what is absolutely free from artificiality.") NBLe, p.58.

The first three movements have no voices, but the instrumental solos are suggestive of the voices of the earth. For example, in the third movement, the posthorn solo interrupts the scherzo. Solvik [Olsen] has suggested that the melody comes from Franz Liszt’s *Rhapsodie espagnole* [1863]. This melody seems disjointed because of the change in musical texture and character, which also often happens when a composer adds a singer with text. Mahler marked the posthorn solo with “Der Postillon!,” which is the title of the poem by Nikolaus Lenau. In this poem, the postillion mourns his dead comrade and Mahler sets this as a quiet contemplative melody.

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The main theme of the Scherzo from the third movement (entitled “What the Animals in the Forest Tell Me”) comes from “Ablösung im Sommer,” which is an early Wunderhorn Lied that Mahler wrote in the late 1880’s. The text for this song speaks of a Cuckoo bird that has died. The animals in the forest trivialize the death of this bird by saying “Who is going to pass the time for us the whole summer long?” Therefore, in this movement, Mahler sets up two diametrically opposed views of death. Mahler reinforces these views by adding another quote from “Das irdische Leben” (The Earthly Life), which is Mahler’s own Wunderhorn setting of a song on the death of a child. In this song, the child is starving and asking for bread, but the mother keeps saying that tomorrow we will have bread. This interchange keeps going on for days until finally they bake the bread, but it is too late, and the child is dead. Examples 3a and 3b below, show the quotes from “Das irdische Leben.” Notice the similarities of the oscillating sixteenth notes (first minor seconds then perfect fifths) in 3a and the chromatically descending lines in 3b.
Solvik [Olsen] writes, “Mahler’s apparent covenant with nature reveals itself instead as an essay in alienation…. The fairy-tale world of the animals is tinged with a cold disregard for death.” Mahler himself said, “In this piece it is as if Nature herself were pulling faces and putting out her tongue. There is such a gruesome, Panic humour in it that one is more likely to be overcome by horror than laughter.”

In the fourth movement, Mahler introduces the solo voice, but the way he introduces it is quite remarkable. The voice enters on a vowel “O Mensch,” so it sounds at first like any other solo instrument. The treatment of the voice here is completely opposite from how Mahler introduced the posthorn solo. Instead of a change of texture and melody, the voice grows out of the orchestral accompaniment. Perhaps Mahler intended it to sound as though Humanity grew out of the animals. The text is adapted from Nietzsche’s *Also Sprach Zarathustra*. Mahler intended this movement to point toward Heaven. He quotes parts of the original finale he wrote, which is the orchestral setting of the *Wunderhorn* song “Das himmlische Leben” (The Heavenly Life).

This song is in direct contrast to “Das irdische Leben.” Both are from a child’s perspective, where on Earth, there is not enough food to eat, but in Heaven, there is always plenty of food to eat. The words for this movement speak of midnight, deep suffering, deeper joy, and desire for eternity. It also speaks of day and night in the sense that the world is deeper than the day had been aware. This reflects another Romantic period ideal that is also found in *Tristan und Isolde*: the idea of being liberated from the realm of “Day” to exist in the preferable realm of “Night.” Mahler originally wrote “Der Vogel der Nacht” (the Bird of the

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Night) on the score by the Oboe part in measures 31-35. One can also see this quote of the same bird song in Mahler’s song “Um Mitternacht” in measures 16-22. It consists of a rising third drawing upwards like the sound of nature, and then a dramatic fall, plummeting over 1.5 octaves (which corresponds to the falling/failing of the life-will motive introduced in the first movement). This Bird of the Night is reaching up to Heaven (rising third), desiring eternity, but not arriving in this movement (plummeting over an octave) [see Example 4b].

This is not the first time that Mahler has written out quotes of bird songs. In order to gain a better understanding of the importance of these bird songs, it is helpful to explore them in the following works. He also wrote “The Bird of the Apocalypse” as two flute parts in the Finale of his Symphony No. 2 in C Minor and the Cuckoo call in the clarinet in the beginning of his Symphony No. 1 in D Major. Mahler enjoyed nature very much and composed at several composing huts in rural areas, including Steinbach am Attersee, where both Symphonies Two and Three were written. He may have been inspired to write out bird songs by nature, and also because Beethoven wrote out the songs of the Nightingale, Quail, and Cuckoo in his Symphony No. 6 in F Major “Pastorale.” One can see Mahler’s written out bird songs of this movement in examples 4a-c below:

Example 4a (below): “Der Vogel der Nacht,” (The Bird of the Night)

Mahler, III / iv / 31-35

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Example 4b (below): Mahler, “Um Mitternacht,” mm. 16-22. Notice the plummeting interval in the Oboe, symbolizing failure.

Example 4c (below): Mahler, III / iv / 71-81
The fifth movement reveals two choirs (boy’s and women) as the voices of angels. This movement is a conversation between the female singer and the angels. The text is from the Poor Children’s Begging Song from *Des Knaben Wunderhorn*. The singer laments the fact that she has broken the Ten Commandments and weeps because of it. The angels console her and urge her to turn to the merciful God in prayerful repentance. By doing this and loving God forever, she will attain the heavenly joy prepared by Jesus – the eternal life that she was longing for in the fourth movement. One of the excerpts that foreshadows the original finale (now the finale of the Fourth Symphony) is the section of the text where she sings “Oh come and forgive me!” See examples 5a and 5b below:
Example 5a: Mahler III / v / 58-62
Example 5b:
(left and bottom)
Mahler IV / iv / 105-113
This is the third and final quote of this progression from the fifth movement of the Third Symphony. The previous two presentations were fragments (first the ‘a’ fragment is presented, and then the ‘b’ fragment). This time both ‘a’ and ‘b’ fragment are presented together. So many ‘3’s’ exist here that one can hardly deny the reference to the Holy Trinity: This is the 3rd time it appears...
Mahler also foreshadows the “slaughtering-of-the-lamb” material in the oboe. These figures are a clear reference to Christ’s sacrifice. The *Agnus Dei* liturgy of the Catholic Mass is translated:

Lamb of God, who takes away the sins of the world, have mercy on us.
Lamb of God, who takes away the sins of the world, have mercy on us.
Lamb of God, who takes away the sins of the world, grant us peace.

See examples 6a and 6b below:

**Example 6a:** right
Mahler IV / iv / 57-59
Sound of lamb being slaughtered in oboe, coincides with the text: “Saint John lets his little lamb go, Herod, the butcher looks out for it! We lead a patient, innocent, patient, a

**Example 6b:** below
Mahler III / v / 40

In the final, sixth movement of Mahler’s *Third Symphony*, he leaves out all human voices. This, along with the original programmatic title “What Love (God) Tells Me,” suggest that Mahler believed that what Love and God told him was more than words can speak: God told him the loving, sacrificial actions of Christ and the gift of faith. Mahler, as a Jew who

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converted to Catholicism, adapted many Christian concepts without embracing everything fully. His views were still very much molded and challenged by the philosophers of the time, and Mahler struggled a great deal with the details of his faith.¹⁵

For example, the philosopher Arthur Schopenhauer greatly influenced him. Schopenhauer’s concept of “the Will” can be described as a force that drives all things – the blind pursuit of life. He saw music as the highest of all art forms because it is most removed from the visual (and therefore physical) realm of existence. Music, therefore, is the only art form that can overcome or transcend the Will and help people (momentarily) escape the grasp of the Will.¹⁶ Charles Darwin also challenged the views of Creation with his theory of Evolution. Nietzsche’s philosophy that God is dead and the light resides in each of us also challenged Christianity. Sigmund Freud wanted to make the unconscious more concrete and suggested that our dream world is actually more real than the waking world. All of these ideas greatly disturbed the conservative Viennese around the turn of the 20th Century, and Mahler was not unaffected.

The thematic material Mahler used in the sixth movement comes from many places. It is a quote of Beethoven’s String Quartet, Op. 135, and also the Faith motive from Wagner’s Parsifal. See examples 7a and 7b below:

Example 7a: left
Wagner’s Faith motive in Parsifal. Towards end of Act I a boys’ choir from lofty heights sings “Der Glaube lebt; die Taube schwebt, des Heilands holder Bote.” (The faith endures, the dove, the Saviour’s loving messenger, hovers.)

This motive is also an inversion of the contour of the life-will motive that was presented early in the symphony. The life-will motive was associated with striving and failing (ascending then plummeting contour). This transformed love motive of the sixth movement gently falls down and is lifted back up again. Mahler wrote at top of the sixth movement: “Father, look upon my wounds, let no being be lost.” This is a reference to Christ’s wounds and sacrifice; and the concepts of atonement and redemption, which are also very Parsifal-like. Perhaps Mahler used this in this movement to show us that we don’t have all of the answers and that faith is necessary to believe what love or God tells us. Even in this “happy ending,” there is still suffering, represented through many painful dissonances. However, it is now intentional suffering, that is, God’s suffering: bearing the sins of the world through love.

Mahler’s compositions were controversial until the last decade of his life. Some people saw his works as eccentric while others viewed them as expressions of the “New

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German” modernism which was associated with Richard Strauss. Finally in the last ten years of his life, he began to receive more support for his compositions. Unfortunately, Mahler’s compositions were not performed very often until the centenary of his birth in 1960.\(^{18}\)

Leonard Bernstein was influential in reviving Mahler’s symphonies. Mahler instinctively knew that his works would not be fully appreciated for what they were until after his death.\(^{19}\) Natalie Bauer-Lechner recorded Mahler’s thoughts on the first movement of the Third Symphony:

> Real horror seizes me when I see where it is leading, the path the music must follow, and that it fell upon me to be the bearer of this gigantic work. As sometimes a personal experience will illuminate and fully bring home to one the significance of something long known, so today it came to me in a flash: Christ on the Mount of Olives, compelled to drain the cup of sorrow to the dregs -- and willing it to be so. No one for whom this cup is destined can or will refuse it, but at times a deathly fear must overcome him when he thinks of what is before him. I have the same feeling when I think of this movement, in anticipation of what I shall have to suffer because of it, without even living to see it recognized and appreciated for what it is. For this really distances itself too far from all that is past to call it music anymore; it is, rather, a mystical, immense sound of nature.\(^{20}\)

To conclude, Mahler’s *Symphony No. 3 in D Minor* has a diverse origin, which was mainly inspired by God, nature, bird songs, and philosophy. Mahler’s quotes, use of songs, and allusions to bird songs create powerful music, which communicates deep, and far-reaching eternal concepts that cannot be expressed fully through words.


\(^{20}\) Ibid.
Works Cited


Connecting the Dots: Solving the Mysteries of String Articulations

Bowing and string articulations are difficult topics for music teachers and conductors, especially for those who do not play stringed instruments. Probably every orchestra director has some experience with strings—maybe a methods class or even some private lessons. The difficult thing is that most students, and for that matter, most teachers, tend to focus on the left hand, i.e. the notes, in a methods class or basic lessons, because the student can see progress more quickly. Bow technique, i.e. the right hand, is much more difficult to teach. Since the muscles are smaller and the technique more subtle, bow technique really was not taught as a separate skill until the early nineteenth century—about the time the bow design was making the final transition from Baroque to Classical to what is now considered the modern bow. Although this article is not meant to be a history of the violin (or viola or cello…) bow, in order to really understand, as an orchestra director, why certain bow articulation choices make sense for a given piece or composer, one needs to look at the history a bit, and also at the composers themselves. What instruments did they play? Does the notation of an articulation end up with a different meaning based on these factors? And does that meaning change over time?

Figure 1
In figure 1, there are examples of a Baroque bow (top), a transitional bow (middle) and a modern bow (bottom). It is hard to believe that what is called the “modern” bow was actually designed in the late 1700s. As shown in figure 1, the early design used less hair width and has a rather flat tip. Also, the stick is slightly bowed out. The Baroque bow is shorter and lighter than a modern bow, but does have a screw mechanism to adjust tension, which was a fairly early improvement from the earliest violin bows.¹

Articulations in the Baroque style were primarily either connected (e.g. sixteenth notes) or detached (e.g. quarter and eighth notes). Because of both the design of the bow and the rudimentary bowing technique of the day, the one thing the Baroque bow did not generally do was sustain.

Much like today, as the music began to change, so did the technology. The move from the contrapuntal Baroque style to the more sustained and lyrical Classical style demanded a different type of bow. There is no widely accepted “Classical bow” design; instead there are many “transitional bows.”

Figure 2

The modifications to the Baroque bow design began as early as 1725 and continued on until the end of the eighteenth century, with the French bow maker, François Tourte (1747-
1835), arriving at what would come to be known as our modern bow (see examples of transitional bows in figure 2).

Tourte’s primary changes were:

- Lengthening the bow stick
- Making the ribbon of hair wider and flatter
- Making the screw mechanism more precise
- Using Pernambuco wood (very hard wood, stronger than materials previously used, but flexible) from the Pernambuco tree (also Brazilwood tree—Pernambuco is the very core, or most dense wood of the tree)
- Lightening the weight of the tip and changing its shape (as shown in figure 3), resulting in more space between the hair and the stick

Figure 3

Tourte’s bows significantly changed the timbre of the instruments, making a fuller, louder sound. They also produced instant response instead of the swell (*messa di voce*)
associated with earlier bows. They allowed for a more full and powerful sound to fill concert halls and also could produce an evenly sustained phrase. Thanks to Tourte, the door was opened for a whole new technique to be taught specific to the use of the bow, since his design allowed for the production of a variety of articulations. Tourte is known as the “Stradivari of the Bow” since his bow design has stayed unchanged for the most part since his death in 1835.3

A good example of the new focus on bowing technique can be found in Etude no. 2 from *Forty-Two Studies* by Rodolphe Kreutzer (1766-1831),4 which was, sadly, made famous in a comedic routine by the late Jack Benny through his amusing, not-so-stellar performances (figure 4).

![Figure 4](image)

Interestingly, Kreutzer wrote eighty-one bowing variations for that one exercise because bowing technique as something to be taught separately was essentially a new concept (figure 5).
The relationship between articulation and notation is closely related to the development of the bow from the Baroque to the Tourte design. How did the design of the equipment that composers like Bach and Handel had at their disposal affect string articulation and the way it was notated?

Figure 6 presents an example from the first violin part to Bach’s Brandenburg Concerto no. 3 in G Major, BWV 1048. Bach himself was best known as a keyboard player and composer but was also a violinist and violist. As is so often the case in Bach’s music, very
little is indicated as far as articulation or dynamics. Other than an occasional piano or forte indication, the rest—dynamics, phrasing, improvisation—is left to the performer. We generally know this as performance practice.

Traditionally, this opening motive is played with a space after every eighth note, with the sixteenth notes played very connected. There are no staccato dots on the eighth notes, even though aural tradition tells us to interpret those notes to be short and have space after them. There was no need for Bach to indicate staccato dots on the eighth notes because the bow being used would not have had the capability of sustaining through. (Keep in mind that the keyboard instrument of the time—the harpsichord—also did not sustain.) The bow strokes in Baroque era compositions are for the most part played on the string, and in the middle portion of the bow.⁵

With the advent of the transitional bows, leading up to Tourte's design, composers began to indicate desired articulations. In the new French school of bow technique, new strokes were born, such as staccato and martelé, both of which were strokes done in the upper part of the bow. Bouncing, thrown, or springing strokes--those which would typically be designated spiccato-- were not widely used until the middle to late nineteenth century. Most of the Classical period composers who wrote passages of sixteenth notes with dots on them would have expected them to be executed in the upper half of the bow and more on the string.⁶
Figure 7 shows an example of a sixteenth note passage from Mozart’s Symphony no. 35 in D Major, K. 385 (Haffner), composed in 1782. Mozart, like Bach, was a keyboard player who was well-known for his piano performances, and was also a violinist. In this example, the dots on the sixteenth notes indicate short articulation, which would likely have been played near the tip of the bow in Mozart’s day. It was the violinist Wilhelm Cramer (1746-99) who is credited with developing the bouncing, or what we know as the spiccato bow stroke. Despite his efforts to popularize his new style of playing, an article from 1803 states that not many violinists could adopt the new technique and even “ruined their previously good manner of playing after laborious effort to play with the middle of the bow, through too strong pressure on the strings. The bow hopped here and there, and the tone became unpleasant, rough, and scratchy.” (Anyone who has taught or conducted young players attempting spiccato is likely quite familiar with this sound.)

Because modern players enjoy the benefit of Cramer’s efforts in developing bouncing bow technique, it would be more typical to play these sixteenth notes in the middle of the bow and slightly off the string, rather than the more historical way of playing them lightly in the
upper half. It is worth noting that the notation of the dots on the sixteenth notes in this example is really more an indication of a short and light articulation rather than a suggestion of a part of the bow in which the passage is to be played. The dots are present in the manuscript, and Mozart even includes the word *sciolte* over the sixteenth note passage which means “loose.” Thus, the manner of execution of the articulation is somewhat left to the performer and the century in which he or she lives.

Figure 8

In Haydn’s Symphony no. 96 in D Major, Hob. I:96 (*Miracle*), composed in 1791, there are dots on the descending eighth notes in the passage, indicating a short articulation (figure 8). Unlike the Mozart Symphony No. 35 example, there are not dots on the sixteenth notes, only on the eighth notes. Would the eighth notes be played on or off the string? In the middle or upper half? It would depend on whether the interpretation is inspired by the eighteenth or twenty-first-century standards. The dots, again, are to indicate space between the notes—an articulation, not a bowing or place in the bow. Perhaps Haydn wanted to ensure that these notes would not be connected, since transitional or Tourte-style bows would have been widely used by this time, and would have allowed for both *legato* and *staccato* articulations. As a string player himself, Haydn would have been aware of the bowing styles that were being taught. Though the dots on the eighth notes do not continue at the end of the second line of the example, it is likely that the articulation was supposed to stay short. It was
not uncommon, after a few bars of an articulation, for publishers to no longer print the indication even though it was expected to continue. The reason? Simple economics. It saved ink. The articulations in this edition of the Haydn symphony are those indicated by H.C. Robbins Landon.

Figure 9

Moving on to Beethoven. The passage shown in figure 9 from Beethoven’s Symphony no. 9 in D Minor, opus 125 (composed 1824) presents a new bowing and articulation challenge: rapid eighth notes coupled with string crossings. The edition in figure 9 shows dots on the first several eighth notes, while other editions show caret accents (figure 10) and some show no indication.

Figure 10
Beethoven was himself primarily a pianist, though he did play viola, so he was familiar with both piano and string articulations. In his piano music, Beethoven sometimes used the dot on a note as a type of accent as seen in this passage from his Piano Sonata in A flat Major, opus 110. It does not indicate that the note with the dot is any shorter than any of the other notes (figure 11).^10

Figure 11

The string crossings in the passage from Beethoven’s Symphony no. 9 (figures 9 and 10) complicate matters because, typically, one would execute string crossings in the middle of the bow (near the balance point) instead of the upper half, for reasons of geometry. With a fulcrum and lever, such as a seesaw, the point of least movement is the fulcrum. The placement of the bow on a string results in a fulcrum and lever relationship. Placing the bow in the middle, or fulcrum, for string crossings requires the least amount of arm motion to jump from low to high strings. Therefore, it is unlikely this passage would have been executed in any other part of the bow.

Another suggestion as to the desired bow placement is Beethoven’s indication of fortissimo. Since, by 1824, players were getting more technically comfortable with the
Tourte-style bow, it is likely that the players were comfortable playing a passage like this more toward the middle of the bow. Modern players would likely use what is called the brush stroke for this passage.

Though most music dictionaries contain bowing terms like *spiccato*, *marcato*, *staccato*, and *ricochet*, they do not typically include “brush stroke,” even though it is in the common vernacular of string players. The brush stroke is a slightly off, but heavy stroke, which results in the *fortissimo* dynamic, but allows for clean string crossings. It is not a particularly vertical stroke like *spiccato*, and is commonly used in some Beethoven and, later, Romantic music.

After Beethoven, things get more complicated for string articulations in orchestral music, since symphonic composers tended to be pianists and dots in piano can be interpreted as touch rather than note length. Therefore, dots in the Romantic symphonies are sometimes rather long notes, especially if they are written under a slur.

Figure 12

If anyone doubts that Brahms’ slur indications are phrasings and not an indication of bowing need only look at the opening of Brahms’ Symphony no. 1 in C Minor, opus 68, composed 1855-1876 (figure 12). Clearly, he did not mean the long slurs to be the bow direction. Yet he did mean for the whole passage to be *legato*, requiring the bow changes to be as smooth as possible. Passages like this remind string players that bowings need to be dictated by the intention of the composer, not the player’s convenience.
In this passage from the second movement of Brahms’ Symphony no. 1 (figure 13), there is the use of dots under a slur. Like a pianist would interpret this *portamento* notation, these notes are long notes with a slight articulation on each one. They would be played on the string in order to produce the desired length. These dots are clearly indicated in the manuscript.  

This passage from the second movement of Tchaikovsky’s Symphony no. 4 in F Minor, opus 36 (beginning at the Tempo I, figure 14) demonstrates a number of different articulations and opens the door to many interpretations. Tchaikovsky’s indication of
*cantabile* for the entire passage would imply that, even though there are dots on a number of eighth notes (both separate eighth notes and under a slur), the length would not be particularly short. These dots seem to indicate more of a slight release between notes rather than short length, the way a pianist, like Tchaikovsky himself, would play it. Of course, the violin section would be aware that the oboe player has already established the interpretation of these dots earlier in the movement. Later in the example, there are dashes on quarter notes, which typically indicates long notes, but with a slight separation.

Figure 15

One little curiosity that has perplexed conductors and violinists for years is a bowing indication in Tchaikovsky’s *Dance of the Sugar Plum Fairy* from *The Nutcracker*, opus 71 (figure 15). As mentioned earlier, playing short notes in the upper half of the bow was quite common until the end of the nineteenth century. Playing at the frog, or at least in the lower half of the bow, is more of a twentieth century bow technique. Note the indication by Tchaikovsky at the pairs of sixteenth notes at letter B. Although most twenty-first century
violinists will play this passage short and in the middle of the bow, Tchaikovsky clearly intended for it to be played in the nineteenth century style: *a punto d’arco*, meaning at the tip of the bow.

Figure 16

As the Romantic period gave way to the twentieth century, a riot was brewing in Paris. The year was 1913 and the piece was Stravinsky’s *Rite of Spring* (figure 16). Not only were the music and choreography shocking, but a new bow technique was on the rise: repeated down bows at the frog. As mentioned earlier, any string player of good taste did not play at the frog, as the result of doing so would be “crisp, loud and noisy.”

This is exactly what Stravinsky was going for. Stravinsky’s orchestral works were on the cutting edge of bow technique, as the repeated down bows and the “thrown bow” or jeté stroke can be found in earlier works like *Firebird*. 
In 1928, only fifteen years after Stravinsky created waves in Paris with *Rite of Spring*, George Gershwin’s *An American in Paris* premiered in New York City. Gershwin was also a pianist, so his use of the dot as an articulation was used sometimes as a short note indication, as seen at rehearsal 3, marked *Vigoroso*, as well as at rehearsal 4, with the indication of “near the frog” (figure 17). He was very specific in both the articulation and timbre he was after, even using the frog of the bow to produce a *piano* dynamic.

However, four bars after rehearsal 64, the indication on the pairs of eighth notes is more like Brahms’ use of the pianist’s *portamento* articulation, indicating a slightly longer stroke (figure 18). Gershwin even wrote *legato* under the passage as an indication the notes are not to be played too short.
Following the legacy of Paganini, Rode and Kreutzer, and through the teaching of masters like Leopold Auer and later Ivan Galamian, bow technique has grown to include strokes of all kinds. During the twentieth century, mastery of all the bow strokes, and especially of controlling the middle to lower part of the bow, became essential for orchestral players. Knowing what was typical, and what was not, in earlier centuries is not as well known, both for players and conductors. It would not be possible to cover every articulation and every interpretation in this article, but hopefully the reader’s curiosity is a little piqued about the historical context of string articulations as well as the backgrounds of the composers themselves. Perhaps I have not solved all the mysteries of strings articulations, but, hopefully, you will find yourself never looking at a dot in quite the same way.

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Silvestre Revueltas and His Works for Chamber Orchestra: A Conductor’s Analysis of “Ocho Por Radio”

The culmination of the nineteenth century and the outset of the twentieth century brought an ideal moment for the emergence of national styles throughout areas that were not previously included in the study of western music history. During this time, the rising of regional styles in countries outside of Europe revealed how the predominant Romantic and Post-Romantic styles were outside of the western world. These styles merged with idiosyncratic music traditions, such as folkloric rhythms and tunes, unusual musical instruments and diverse circumstances for music creation, performance and instruction. The Modern Latin American musical style demonstrates how regional colors and customs combine with European Classical and Romantic influences coming from Spain, France, Italy, and Africa, due to the cultural exchanges that occurred in the Colonial period and beyond.

Representing the line of prominent Latino American composers from the early twentieth century, Silvestre Revueltas (1899-1940) has been studied as one of the most salient Mexican musicians. Despite living for a brief period of time, Revueltas stands out as one of the most prolific Latin American composers whose repertoire includes a vast variety of pieces written specifically for chamber orchestral settings. The purpose of this discussion is to survey the works for chamber orchestra by Revueltas, including a discussion on the conductor’s implications of his miniature work Ocho por Radio.
Biographical Notes about Silvestre Revueltas

Silvestre Revueltas was born in the state of Durango, Mexico, on December 31, 1889. His parents, José Revueltas (1871-1923) and Romana Sánchez (1883-1939), initially enrolled him in violin lessons with a local teacher during his early years in his hometown, Santiago Papasquiaro. Later, his wishes for pursuing a better musical instruction led him to relocate in Mexico City where he studied violin and composition at the National Conservatory of Music, under the tutelage of José Rocabruna (1879-1957) and Rafael Julio Tello (1872-1946).\(^1\)

Soon after he began his studies at the National Conservatory in Mexico City, Revueltas moved to Austin, Texas, where he enrolled in Saint Edward’s College to pursue piano studies with Louis Gazagne. Not satisfied with the instruction, Revueltas transferred to Chicago Musical College, where he studied violin, harmony and composition, and graduated in 1919. He then toured Mexico as a violin virtuoso and did further studies with renowned Czech violinist Otakar Ševčík (1852-1934). After learning about the death of his father in 1923, Revueltas returned permanently to his home country. He started a successful career as a soloist, having the opportunity to meet Carlos Chávez (1899-1978), who motivated him to keep with his compositional career and who also became one of his most important influences. Upon Chávez’s appointment as the Director of the Orquesta Sinfónica Mexicana and as the Chair of the National Conservatory of Music, Revueltas was invited to join the faculty at this institution, and from 1929 to 1935 he served as the Assistant Conductor of the Orquesta Sinfónica de México, a position that inspired him to continue with his composition activities. During the same time, Revueltas kept his links with North America, developing a strong friendship with Aaron Copland, who invited him to participate in the First Festival of

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Contemporary American Music in which Revueltas premiered his Second String Quartet, a work that gained him immediate recognition on an international stage.

In 1933, Revueltas was appointed as the Interim Director of the National Conservatory of Music in Mexico City, which, by that time, was politically divided between a group of veteran musicians that favored conservative musical tastes and a group of innovative artists – such as Chávez – aiming for new aesthetic styles. The tense environment at the Conservatory forced Revueltas to resign his position, putting an end to his relationship with Chávez.² Family anecdotes indicate that the professional and personal discrepancies between Chávez and Revueltas were strong and did not turn in a positive way: His sister Rosario recalled that Chávez would ask friends he had in common with Revueltas to take him out for drinks and then get him intoxicated, in order to make him unable to conduct performances he had scheduled for the following day.³

By 1936, Revueltas interest in politics increased and he joined the Liga de Escritores y Artistas Revolucionarios (League of Revolutionary Writers and Artists). This was an extreme-left organization founded in 1933, whose purpose was to disseminate revolutionary propaganda against the government censorship towards artists and to condemn the ideals of Hitler, Mussolini and the Spanish Civil War. On regard of the latter, Revueltas – as several other artists overseas – was highly impacted by the assassination of Spanish poet Federico García Lorca, who was sent to death by General Francisco Franco in 1936. As a tribute to the deceased poet, Revueltas wrote Homenaje a Federico García Lorca, one of his most regarded instrumental compositions which was premiered in 1937.⁴

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³ Jack Lee Dean, “A Discussion of the Background and Influences Affecting his Compositional Style” (DMA diss., University of Texas at Austin, 1992), 11.
⁴ Hernández, 19.
Contrasting to his prolific compositional career, his personal life had moments of significant inconsistency. He suffered mood swings and depression, and was married on two occasions. His first marriage occurred in 1920 with Jule Klarecy in Chicago, who gave birth to one daughter, Carmen, who died at an early age. He divorced Klarecy in 1927 and by 1930 he married one of his students, Angela with whom he had three daughters: Natalia, Alejandra – both also died during their childhood – and Eugenia, the only one who survived and the person who took care of the custody of his manuscripts. His uneven psychological and physical condition was weakened by severe alcoholism, which resulted in being hospitalized in 1936. Unfortunately, his alcohol abuse complicated the pneumonia which eventually caused his death on October 4, 1940. Revueltas was buried at the Panteón Francés and his remains were moved in 1976 to the Panteón Civil de Dolores in México City. After his death, his sister Rosaura – who originally did not have a close relationship with Revueltas – took a significant role in the publication of his works and took leadership for the diffusion of the legacy of her brother.

Overview of Musical Works

The music by Silvestre Revueltas features primarily short compositions and chamber works throughout his compositional catalog. He refused to write larger European-styled forms such as symphonies, symphonic poems, operas or sonatas. His works are mostly programmatic and portray scenes of the Mexican life through the vivid character of the folkloric dances he employed in his music. His most important chamber compositions include Batik (1926) for string trio, El Afilador (1929) for small wind ensemble, and Cuatro Pequeños Trozos (1929) for two violins and cello. From 1930 to 1932 he wrote his four string quartets. His last quartet, named Música de Feria, was written in 1932 along with his Three Pieces for

5 Dean, 13.
Violin and Piano. A couple of woodwind quintet pieces, Dos Piezas Serias, were written before his passing in 1940.

His most prominent large symphonic works are Itinerarios, Música para Charlar, Sensemayá – all written in 1938 – and also La Noche de los Mayas (1939). The latter was originally conceived as a film score which has been adapted by Paul Hindemith and José Yves Limantour. Revueltas wrote two ballets – El Renacuajo, (premiered the day of his death in 1940) and La Coronela, an unfinished work that was completed later by Mexican composers Blas Galindo and Candelario Huízar. Additionally, Revueltas is regarded as one of the most prolific film composers from Latin America. He wrote music for the movies: Redes and Vámonos con Pancho Villa (1935), Caminos and La Bestia Negra (1936), Ferrocarriles baja California, and El Indio were written in 1938. El Signo de la Muerte was written the following year and Los de Abajo and ¡Qué Viene Mi Marido! from 1940.

Music in México and Latin America During the First Decades of the 20th Century

By the turn of the twentieth century, the incorporation of nationalistic elements was an emerging feature in the development of the musical language of Latin American composers. Their music had been highly influenced by the European tradition brought to their lands since the fifteenth century. Throughout the nineteenth century, the construction of national theaters and opera houses began in the most important cities from South America. Those venues mainly hosted European companies who brought celebrated singers and instrumental virtuosos from Italy and Spain that were crucial in the development of music education in countries such as Guatemala, Costa Rica, Argentina or Brazil. These virtuosos and impresarios instructed and employed local musicians to perform in the productions that were presented during the mid-1800s. Many of those musicians remained in those countries for

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longer period of times or even decided to relocate there. One example of such circumstances happened in San José, Costa Rica. Vargas explained the conditions of Spanish musicians who visited that country in the late nineteenth century:

While some of the musicians that arrived with the visiting lyric companies stayed for a relative brief time, others did it for a prolonged period or even decided to relocate permanently. Since there were no other musical institutions other than the concert bands they came up with ideas that allowed them to make a living from music: They offered private lessons at the public schools, became church musicians, organized schools of music and philharmonic societies, arranged or composed works for the existing music ensembles or even joined them. In all the cases, their contributions were crucial, as they had solid foundations and extensive expertise from their countries of origin.\(^7\)

European models of music remained a predominate influence in the region. As for the situation of music in Latin America, Béhague stated that European opera and zarzuela were the most direct influences that shaped the musical language of late nineteenth century Latin American composers.\(^8\) Another European influence was the emergence of virtuoso performers, especially pianists. Many of them wrote music for their own performances and created popular repertoire for salon-music, such as polkas, mazurkas or waltzes. In Mexico, Juventino Rosas (1868-1894) was regarded as the most prominent pianist composer of the end of the nineteenth century.\(^9\)

From 1876 to 1911, Mexico was governed under the dictatorship of Porfirio Díaz. Called the *Porfiriato*, this era was crucial in the transition from a rural society into a modern country. However, it was a moment in which the common population lived under repression and poverty as two classes – a wealthy society and a poor class consisted of mestizos and Indians – were clearly segregated. As a result, the Mexican Revolution started in 1910,

\(^7\) María Clara Vargas, *De las Fanfarrias a las Salas de Concierto: Música en Costa Rica, 1840-1940*, (San José: Editorial de la Universidad de Costa Rica, 2004), 50-51. Translated by the author.  
\(^9\) Ibid., 98.
enhancing a movement of awareness towards the ideas of social equality, and marking the beginning of a nationalistic movement that was called *El Renacimiento Azteca* (the Aztec Renaissance).\(^{10}\) As part of this trend, musicians became more aware of Indian or folkloric mestizo traditions employing their melodies, rhythms or instruments as sources of inspiration.\(^{11}\) Therefore, styles such as the *son, corrido, jarabe*, or *huapango* were included in academic music by composers including Manuel Ponce (1882-1948), Carlos Chávez (1899-1978), or Jose Pablo Moncayo (1912-1958).

By the time of the Mexican Revolution, the reaction of artists towards the political tension was imminent. Many of them joined associations or ideological societies in order to promulgate their position towards the oppression and censorship exerted by Díaz and his adherents. A wave of populist nationalism inspired painters and muralists to found their works in aboriginal topics.\(^{12}\) Identified with his mestizo background, Revueltas took an important part in the political revolution by joining the Board of Directors of the *Liga de Escritores y Artistas Revolucionarios* in 1936. Roberto Kolb, one of the most well-known scholars of the music of Silvestre Revueltas, explained how the composer had a crucial role in such an organization:

> In the aftermath of its Revolution, Mexico was agitated by political and ideological turmoil among its artists and intellectuals. Revueltas shared with his fellow artists the belief in popular cultural expressions as the ideal foundation for the development of a "new revolutionary culture." In fact, he was at one time the chairman of the League of Revolutionary Writers and Artists. His much better-known contemporaries, the painters Diego Rivera, Frida Kahlo, José Clemente Orozco and David Alfaro Siqueiros were also actively militant, but they knew how to exploit their political exoticism to gain prestige, popularity, international connections and commissions. In Revueltas' case, however, his deep-felt convictions - in combination with his natural tendency towards withdrawal and solitude - left him in political isolation.\(^{13}\)

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\(^{11}\) Béhague, 125.

\(^{12}\) Sparks, 4.


Silvestre Revueltas as a Conductor

Silvestre Revueltas not only had an active career as a performer and a composer, he also was one of the most regarded Mexican conductors from the early 20th century. His activities as a conductor not only helped him to gain recognition among the important musicians of his country but also provided him the opportunity to write a vast number of compositions for symphonic and chamber orchestra. Revueltas was appointed as a faculty member of the National Conservatory of Music in Mexico City from 1929 to 1935, upon accepting an invitation from its director, Carlos Chávez. His duties there included teaching violin lessons, conducting the Conservatory Orchestra and serving as the Assistant Conductor of the Orquesta Sinfónica de Mexico, an opportunity that allowed him to premiere several of his own compositions.14

By 1930, the emergence of Mexican radio stations was an important musical revolution for that country and Revueltas took advantage of this new medium by writing and directing small orchestra compositions to be broadcasted live such as Ocho por Radio, written for the Orquesta de Cámara de la SEP. Major political changes in the administration of the National Conservatory of Music replaced Carlos Chávez with Estanislao Mejía, one of the strongest opponents to Chávez. Among those changes, the name of the Conservatory Orchestra was changed for Orquesta Sinfónica Nacional to compete against Chávez’s Orquesta Sinfónica de México. In 1935, Revueltas accepted Mejía’s invitation to become the Music Director of the renamed orchestra, a situation that put an end to the friendship between Revueltas and Chavez.15

http://www.peermusicclassical.com/composer/composerdetail.cfm?detail=revueltases
say

14 Hernández, 15.
15 Ibíd., 17.
Not only active in his own country, Revueltas lead performances of his own music in Spain during the trips he made to Barcelona and Madrid in 1937 with the *Liga de Escritores y Artistas Revolucionarios*. On September 17, he made his European conducting debut presenting *Janitzo, Colorines, Caminos, El Renacuajo Paseador,* and *Homenaje a García Lorca* with an orchestra called *Unión General de Trabajadores* (General Workers Union Orchestra).\(^{16}\) A few weeks afterwards, on October 7, he conducted *Redes, Caminos,* and *Janitzo* at the Palau de la Música Catalana in Barcelona. Here he had the opportunity to work with the musicians of that orchestra led by celebrated Spanish cellist and conductor Pablo Casals (1876-1973). He received rave reviews from audience and musicians alike from his Barcelona performance, as humbly described by Revueltas in a letter to his wife Angela:

> The place where we performed is stupendous, with magnificent acoustical conditions. It is the Palau de la Música Catalana, especially designed for concerts. All the great European conductors have walked in that stage. I felt very proud in front of my orchestra. I was applauded a lot. People say that I have entered to the European musical life throughout very big doors.\(^{17}\)

Revueltas’ thoughts about the craft of conducting were publicly known in his country because of his press declarations to the *Frente a Frente* newspaper in 1937. On regard of his philosophy regarding the craft of conducting and the role of the conductor he said:

> I do not sympathize with the fake art of conducting. I believe that the current emphasis in the praising the role of the modern orchestral conductor rests merit to the work of the orchestral musician. The modern symphony orchestra is a group of perfect individual abilities (…). The contemporary conductor must develop the potential of each member of the orchestra to the maximum. He has to be a tireless, dynamic and disciplined worker.\(^{18}\)

Revueltas mentioned that he liked to conduct as a personal discipline and not as an ambition and compared how the word *conductor* in English is more suitable than its Spanish

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\(^{17}\) *Revueltas*, 114.  
\(^{18}\) Ibíd., 31-32
equivalent of director, as it reflects more what a music director does, as the conductor “conduces and coordinates the ensemble.” He believed that the modern orchestra has been comprised of a group of soloists since Beethoven’s times. In his opinion, the ideal conductor is the one who can balance and coordinate those soloists in the best ways possible.\(^{19}\)

\[\text{Image 1: Silvestre Revueltas in 1930.}\]

\(^{19}\) Ibíd.
Revueltas’ Music for Chamber Orchestra

For this discussion, the term “chamber orchestra” will be assigned to the compositions by Silvestre Revueltas that were conceived for a small ensemble of less than twenty musicians that includes any type of orchestral string and wind instruments. In the catalogue of works by Revueltas, there are ten works written in such format, to be discussed hereafter in chronological order.

*Alcancías* (1932)

This piece in three movements is scored for piccolo, oboe, E-flat clarinet, B-flat clarinet, horn, trumpet, trombone, strings and percussion. The English equivalent of such unusual title is “clay piggy banks”. A relevant aspect of this piece is the absence of cellos from its orchestration and the employment of two high woodwind instruments that double strident brass passages aiming to portray the sound of mariachi bands. Revueltas’ intentions to portray the folkloric elements of his country into his musical language has been called a “Mestizo-realism” style by Otto Mayer-Serra, who stated that Revueltas’ compositional technique is unique due to his incorporation of ancient Mexican folk elements in his complex compositional language.\(^{20}\) The rhythm of the *huapango* is also prominent in this composition, as the binary hemiola against the compound meter are used throughout the movement to exemplify the main features of this traditional folk dance derived from the *Son*, another 6/8 metered dance with has an emphasis in the second beat.\(^{21}\)

*Colorines* (1932)

This piece has a similar instrumentation to *Alcancías* – the only difference is that the former does not feature bassoons. This piece is structured in three contrasting parts, in which a slow section, played by just the wind instruments, divides the two outside sections that

\(^{20}\) Dean, 63.

\(^{21}\) Hernández, 42.
feature dance rhythms. It is notorious that, due to the absence of the violoncello section, the bassoons and contrabasses not only fulfill a harmonic role, but also have a prominent rhythmic participation. Their line is also doubled by the maracas – noted as sonajas in this piece - and the bass drum (See Example 1), and generally it is seen that Revueltas aims to reinforce the dance-like mood in the rapid parts of the piece by the usage of such instruments. 

_Toccata sin Fuga_ (1933)

This composition for solo violin and chamber winds was dedicated to Inacencia Cervantes. In this piece, the use of woodwind instruments is prominent and the overall festive mode is reflected in the extensive use of the rhythm of the _huapango_ due to its alternations between 6/8 and 3/4 bars. This piece is structured in three parts in which the first and third one feature contrapuntal textures. Because of its vivid character, this piece has been associated with Stravinsky’s _Octet for Wind Instruments_ as both share similar styles. The influence of the Baroque _toccata_ is seen in the technically-demanding solo violin part, as this form was used for virtuosic display in the late Renaissance and in the Baroque era.

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22 Sparks, 33.
Planos (1934)

Planos is scored for clarinet, bassoon, trumpet, two violins, violoncello, contrabass, and piano. This piece was dedicated to Mexican architect Ricardo Ortega, a friend of the
composer who was also Revueltas’ initial point of contact with Carlos Chávez.\textsuperscript{23} During the same year \textit{Planos} was later published as a large orchestra composition entitled \textit{Danza Geométrica} (Geometrical Dance). The following entry from Revueltas’ diary explains the programmatic aspect of this piece:

It was played last year. The opinions were divided. Some people thought that it was Stravinsky. Who knows what Stravinsky would have thought. The way it uses two pianos and some gongs, the chords at the beginning and the end remind me one of the sonority of the final chords of \textit{The Wedding} by Stravinsky. Nevertheless, they aren’t the same notes or the same intervals, which probably gives them more similarity. Planos: ‘functional’ architecture that doesn’t exclude sentiment. The melodic fragments bring forth a similar impulse, a similar emotion, to those of other works of the same author. They sing within an obstinate rhythm, always in motion, within a sonority that is perhaps strange, unusual, but is their mood. Materials of construction, such as rhythms and sonorities, may be reminiscent or resemble other rhythms and sonorities, or they are the same, but they are different in feeling, form and expression.\textsuperscript{24}

In \textit{Planos}, Revueltas made use of four different compositional procedures that, according to Leclair, are prominent in most of his chamber compositions: short motivic playing for one or two instruments, overlapping of motives played by several instruments, division of the ensemble in groups performing polyrhythms against each other and a solo melody with a supported ostinato bass.\textsuperscript{25} The form of the piece features a tri-sectioned structure, in which an extensive middle section in a fast tempo is juxtaposed between two passages of recurrent tempo changes in which a fast tempo measure is inserted within the slow parts of the beginning and conclusion of the piece (Example 2).

\textsuperscript{24} Revueltas, 212-213.
\textsuperscript{25} Leclair, 50.
Example 2: Planos, three bars before Rehearsal 2.

*El Renacuajo Paseador* (1936)

*El Renacuajo Paseador* (The Wandering Tadpole), originally written as a ballet in 1933, was inspired in the tale *Rin Rin Renacuajo* by Colombian writer Rafael Pombo (1833-1912). The piece was originally intended to be part of the incidental music for a puppet play that was set at the Teatro del Niño (Children’s Theater) in the same year. However, critical reception suggested the piece was not suited for being performed as incidental music, the reason for which Revueltas decided to remove it from the play and then to revise it three years
afterwards.\textsuperscript{26} The original scoring is for piccolo, E-flat clarinet, B-flat clarinet, two trumpets, trombone, percussion, two violins and bass. For the 1936 version, Revueltas expanded the instrumentation by adding one tuba, four first and four second violins and two basses. With a duration of almost eight minutes, the sarcasm and humor is evident throughout the piece. It includes a sarcastic quotation of Mendelssohn’s \textit{Wedding March} from \textit{A Midsummer Night’s Dream}. The original version of \textit{El Renacuajo Paseador} was finally premiered as a ballet score during the night that Silvestre Revueltas passed away on October 4, 1940.

\textit{Homenaje a Federico García Lorca} (1936)

The horrors of the Spanish Civil War (1936-39) became more prominent to the world with the news of the assassination of Federico García Lorca (1898-1936). The international reaction led to a series of protests and numerous tributes to the defunct poet, including Revueltas writing an homage composition on his memory. \textit{Homenaje a Federico García Lorca} is scored for piccolo, E-flat clarinet, two trumpets, trombone, tuba, tam tam, xylophone, piano, two violins, and double bass. The lack of violas and cellos portray the high-pitched sound of Mexican folk bands, as noticed in the instrumentation of the previously studied pieces.\textsuperscript{27} \textit{Homenaje a Federico García Lorca} was premiered on November 14, 1936 under the direction of the composer.\textsuperscript{28} In the following year, Revueltas traveled to Spain with a group from the \textit{LEAR} (League of Revolutionary Artists and Writers) to protest against the Fascist Movement. During his time in Madrid, he conducted a performance of this piece on September 17, 1937 at the Salón de Actos de la Asociación de Amigos de México. The piece was highly acclaimed and praised as a revolutionary composition by the Spanish press.\textsuperscript{29} In

\begin{itemize}
\item \textsuperscript{26} Eduardo Contreras, \textit{Silvestre Revueltas: baile, duelo y son}. México City: CONACULTA, 2000, 42.
\item \textsuperscript{27} Dean, 83.
\item \textsuperscript{28} Hernández, 19.
\item \textsuperscript{29} Hess, 286.
\end{itemize}
one of his letters to his wife Angela, Revueltas described the environment of the rehearsals and performances:

One day, during one of our dress rehearsals I was impatiently waiting for the arrival of my musicians. It was passed eleven thirty and our rehearsal was supposed to start at eleven. No one got there yet. I thought it was a sabotage and got really mad. Then they arrived little by little and said ‘Maestro, we weren’t able to pass by La Gran Vía nor by Alcalá. The blockades were strong (...)’ I heard the bombing from the place of the rehearsal. I got there way ahead of time as usual, but didn’t give it so much importance as the bombings were recurrent there. When they explained that to me I was so embarrassed of being mad...Then, we rehearsed for the afternoon’s performance. We gave some concerts in Madrid, all very successful and my works: Janitzo, Caminos, Homenaje a García Lorca, El Renacuajo Paseador, Colorines were programmed on it. The theaters were full of soldiers and people from the villages... They were delirious.30

Despite the elegiac concept of this piece, the use of instrumental color resembling folk elements and a high sense of sarcasm are present throughout the piece. Revueltas evokes comic passages with the use of glissandi and staccatisimo tonguing contrasted by pesante articulation in the melody, as seen in Example 3.

30 Revueltas, 121.
Example 3: *Homenaje a Federico García Lorca*, one before Rehearsal 28.

Sensemayá: *Canto para Matar una Culebra* (1937)

Based on the homonymous poem by Cuban Nicolás Guillén (1902-1989) that narrates an aboriginal ritual of murdering a snake, *Sensemayá* was originally scored for piccolo, E-flat clarinet, B-flat clarinet, bass clarinet, bassoon, two trumpets, trombone, percussion, piano, two violins and double bass. The second version of this piece was completed in March, 1938 and is orchestrated for a larger ensemble that includes twenty-seven wind players, full strings and fourteen different percussion instruments. Both versions share the same structure, however for the later one the composer developed more of the music materials from the original chamber piece. The tied music-text relationship with the poem is seen in the way
Revueltas associated the first phrase of the poem – *mayombe-bombe-mayombé* – with a particular rhythmic motive throughout the piece. It appears penciled in the score (Example 4).

In order to understand the text-meaning in *Sensemayá*, Peter Garland explained:

Version one of Revueltas’ *Sensemayá* has the same basic structure as version two, although the latter does significantly expand and elaborate on the former. What constitutes a lucky find for someone attempting an analysis of the piece, is that in two places in the score of version one Revueltas himself penciled in the syllables or text of the poem underneath the musical themes or sections that correspond to them. With these two clues given by the composer himself, the whole structure of *Sensemayá* falls into place quickly, and with surprising similarities and structural affinities with the poem. The text-music relationship is indeed more literal than simply an “evocation”.


*Sensemayá*’s programmatic discourse is represented by constant motor rhythms, contrasting textures, and instrumental color that resembles the musical features of Stravinsky’s *The Rite of Spring*. The ostinato in the bass clarinet part (Example 5) represents the movement of the serpent. The main theme is presented by the trumpet and is heard later in duo with the E-flat clarinet in dissonant intervals. As seen in other pieces, this instrumental combination is preferred by the composer because of its contrasting tone quality. According

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to Sparks, this piece evokes Revueltas’ “hard-lived personality” by the use of violent rhythms and contrasting instrumental colors and is also a display of his interest in the Mexican aboriginal heritage prior to the Spanish Conquest.  

Example 5: Sensemayá, opening bars.

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**A Conductor’s Analysis of Ocho Por Radio**

Written in 1933, *Ocho por Radio for Chamber Orchestra – Eight Musicians*

Broadcasting - is an octet scored for clarinet, bassoon, trumpet, two violins, cello, double bass and percussion (including maracas, Indian drum, and cymbal). Revueltas himself provided an intrinsic description of the piece in his self-written book:

Ocho x Radio: Algebraic equation without possible solution, at least for one who possesses profound knowledge of mathematics. The author has intended to resolve the problem by means of musical instruments, with mediocre successes, that a critic knowledgeable in the matters of numbers could judge with his usual impartiality.  

33 Sparks, 53.
34 Revueltas, 212. Translated by Charmaine Leclair.
Despite the sarcastic description provided by the composer, it is obvious how the title clearly relates to the number of musicians of the piece as *ocho*, the Spanish equivalent of *eight*. With the increase in the number of radio broadcasting stations in the decade of the 30s, Revueltas took advantage of this technology by writing audience-friendlier works of smaller instrumentation suitable for radio studios.

*Ocho por Radio* is in the key of G major. Its form consists on a tripartite musical structure that juxtaposes fast-slow-fast tempi. The outside parts are both in the key of G major. The first one expands from the beginning up to Rehearsal 12, where a three-bar transitional bridge prepares the middle slow section which is in the key of F major that starts in Rehearsal 13, extended throughout Rehearsal 17. At this point another brief bridge leads into the fast tempo and resumes the key from the beginning of the piece. The third section covers from Rehearsal 18 up to Rehearsal 27, where a ten-bar Coda concludes the piece. Overall, the metric aspects serve as elements of contrast between the sections of the piece, as the middle one features an even 4/8 meter with less metric changes as it occurs in the outsider parts where mixed meters abound.

Even though this composition is brief, it possesses a clear form and its music has a delightful character. *Ocho por Radio* represents major challenges to be addressed by the conductor in the rehearsal process. Practical considerations on how to address issues involving rhythm, tone and articulation are included as follows:

*Rhythmic Stability*

The eighth-note is the main rhythmic figure in *Ocho por Radio*, as it serves as a constant motor-rhythm throughout the piece. Therefore, it is important that any instances of repeated eighth notes shall be performed without rushing or dragging the tempo. Example 6 represents one of these sections, as it happens in the beginning of the piece. Note how the
double bass and violin parts emphasize instances of a $3/4$ hemiola, where the musicians should keep the eighth note subdivision as precise as possible.

Example 6: *Ocho por Radio*, Rehearsal 1.

In order to achieve a consistent continuity of the eighth note rhythms, the conductor could ask the percussion player to place an accent at the beginning of each bar. Another way to obtain rhythmic stability is by requiring the cello player to enunciate more the beginning of the slurs and over-emphasize the accents. A normal tendency of compressing slurs – which can easily occur in the cello line - should be avoided in such passages. A similar situation should be avoided in the slow section, Rehearsal 14, where the conductor could ask the violin players to not over articulate the bow changes and also to not compress the slurred eighth notes, as seen in Example 7.
Example 7: *Ocho por Radio*, two bars before Rehearsal 14.

*Tone Quality and Articulation*

In this piece, replicating the tonal attributes of the Mexican mariachi band is an aesthetical challenge for both the musicians and the conductor. In general, the tone of the wind instruments should be bright, quasi-metallic and projected and accented vibrato could be used as well. For the *forte* passages, the strings may play with a heavier bow stroke and closer to the bridge. Example 8 shows a section of the piece where these techniques could be applied.
In order to portray the sound quality of the Mexican folk bands and mariachis, the separated notes – regardless if they are written staccatos, accents or with no articulation markings – should be shortened. Ties should not be sustained and a space between articulated notes could be requested in order to stress the hemiolas. Accents should be performed louder and with a decay at the end of them, and more finger pressure could be requested of the strings in order to obtain stronger pizzicatos.
Baton Technique Considerations

The conducting challenges in *Ocho por Radio* demand an absolute accuracy of the baton technique due to its constant meter changes. In this piece, the most crucial technical demand for the conductor is to restrict the rebound in the conducting pattern, as bigger conducting gestures can create confusion in the mixed-meter passages. Excessive rebound may cause visual uncertainty for the musicians, as they could be unable to identify the strong and weak beats of the bar regarding the conducting pattern.

When conducting mixed meters, it will be helpful for the conductor to allow more resistance to the ictus that corresponds to the part of the bar which contains the larger count of eighth-note subdivision. For example, if the grouping of a 5/8 meter is 3 + 2 and conducted in two, there should be more resistance in the first beat of the pattern. Another aspect to consider in order to provide clarity in the conducting pattern is to start the baton motion always from the wrist, avoiding stiffness in the forearm. Sometimes, rigid conducting patterns may create excessive rebound in the elbows, generating additional visual points that could create metrical confusion for the ensemble. Example 9 represents an excerpt of the piece where the mentioned conducting principles could be applied.
In this example, special attention should be given to the third and sixth bars after Rehearsal 8, where a common tendency is to conduct the 3/8 bar with a sudden rebound. In those type of places, the ictus should be conducted with more resistance, without allowing the baton to come up suddenly. Otherwise, the musicians could feel encouraged to rush the tempo.

There are four passages in the piece in which conducting in a subdivided pattern may be helpful in order to keep the rhythmic cohesion in the ensemble. The first one is one bar before Rehearsal 13 (Example 10), in which conducting “in three” instead of “in one” would help to match the sforzados of the winds with the last note played in the cello and bass part. The second passage that could be conducted in a subdivided way appears two bars before Rehearsal 14 (Example 11) in which the trumpet part and contrabass pizzicatos can be kept
together in a better way if those bars were to be conducted “in three”. One bar before Rehearsal 14 does not need to be beat “in six”. Instead, the conductor may explain to the ensemble that he will treat the second eighth note of the bar as a fermata, staying on the right side of the conducting pattern while counting the remaining beats of the bar.

Example 10: *Ocho por Radio*, two bars before Rehearsal 13.
Example 11: *Ocho por Radio*, two bars before Rehearsal 14.

The transition into Rehearsal 17 (Example 12) is a spot that may require lots of rehearsing. In order to unify the *molto ritardando* one bar before Rehearsal 17, the conductor may conduct this measure “in four”. However, there is no way to prepare the new tempo change. The conductor shall rely on the players’ tempo memory in order to get back into the tempo of the first section. While conducting Rehearsal 17, it is important to restrict the rebound of the first beat and to place the second beat of the conducting pattern as clear as possible. It is this second beat that will project the new tempo.
Example 12: *Ocho por Radio*, four bars before Rehearsal 17.

Example 13: *Ocho por Radio*, three bars before Rehearsal 28.

A final conducting suggestion is to beat the last two bars of the piece “in three” as if they were to comprise a 3/4 time signature. Since Rehearsal 28 is conducted “in two”, keeping
the same beat unit (eighth note equals eight note) may unify the sixteenth notes in the string parts and will help to line up the final Indian drum stroke in a better way, as seen in Example 13.

**Conclusions**

The music for chamber orchestra by Silvestre Revueltas is an example of how composers of Latin America developed their own musical style by the mixture of folk elements with European musical traditions. In the case of Revueltas, there are two musical elements that characterize his compositional language: on one hand, the contrasting orchestral tone quality emulates the sound of Mexican folkloric street groups, achieved by the employment of high wind instruments such as the piccolo, E-flat clarinet, or trumpet. In some cases – as it is exemplified in *Ocho por Radio* – Revueltas omitted the violas in his orchestration in order to favor the higher tessituras of the ensemble. The second one is the abundance of metric variety, featuring hemiolas, constant superposition of binary versus ternary subdivisions and mixed meters. In Revueltas’ music the rhythm is rich and, despite evoking the traditional rhythms of *Huapango*, *Son*, or any aboriginal-originated influences, reflects his personal innovative intent.

*Ocho por Radio* clearly exemplifies this feature in Revueltas’ music. The challenges in rhythm and articulation require detailed attention throughout the rehearsal process of this piece. The constant meter changes make this piece a great conducting etude and could be used as a good pedagogical piece for teaching and learning instrumental conducting. Possessing a skillful baton technique is required by the conducting student, not to mention crucial aspects regarding the craft of conducting such as clarity and knowledge of the score. Without reservation Revueltas can be referred as the “Latin American Stravinsky” due to the rich and varied rhythmic language and instrumental tone color that is evident throughout his music. These musical attributes have allowed him to become one of the most frequently programmed
Latin American composers of the first half of the 20th century, whose music is still widely performed in the American continent and beyond.
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Stravinsky and Tempo: A survey of Stravinsky’s use of tempo modulation through metric relationships in his early Russian ballets—The Firebird, Petrushka, and The Rite of Spring.

The purpose of this study is to survey Stravinsky’s early Russian ballets for the use of tempo modulation through metric relationships in contiguous sections. The concept of tempo modulation is used to find pivot relationships between an ending tempo and a new tempo, to help the conductor and musicians navigate many tempo changes with ease and accuracy. The application of this study is to determine if Stravinsky used mathematics in this way, and then to demonstrate how these modulations can be performed accurately and consistently in keeping with what the composer intended.

Stravinsky’s early Russian ballets, The Firebird, Petrushka, and The Rite of Spring, are suitable for this research as they are categorically similar—being written in the same half-decade—and they have an emphasis on rhythm and meter. Not only are they staples in the orchestral repertoire, they are also seminal works in the ballet repertoire. As such, the ability to execute these works with accuracy and consistency is critically important when accompanying ballet. This study intends to add to the literature with information in order to aid in the performance of these works.

Definitions

It is important to define certain concepts that are crucial to the understanding of this study. First and foremost, the definition of tempo modulation is moving from one tempo to another with a common metric relationship. That is, there are two metric units that continue at the same speed across two different tempos. While many also use the equally valid term metric modulation, this study will continue with tempo modulation since metric modulation often
connotes the same metric unit being used within changing meters. The word *modulation* is often associated with changing harmonies, which is very similar in concept. As a key shifts, there is often some note that is shared between both keys, called a pivot note. Likewise, in tempo modulation, there is some metric unit within the previous tempo that continues into the new tempo in a new way.\(^1\)

The easiest way to understand and navigate tempo modulations is by converting metric durations to metronome marking equivalents. For example, if the given tempo is \(\frac{\text{bpm}}{\text{min}} = 60\) beats per minute (bpm), we can give metronomic speeds to all the metric divisions. To find the speed of the \(\frac{\text{h}}{\text{min}}\), one divides it by 2 because they occur half as often. Therefore, the \(\frac{\text{h}}{\text{min}}\) has a pulse of 30 bpm. A \(\frac{\text{o}}{\text{min}}\), containing four \(\frac{\text{h}}{\text{min}}\), would be the \(\frac{\text{h}}{\text{min}}\) pulse of 60 divided by 4, for a rate of \(\frac{\text{o}}{\text{min}} = 15\) bpm. Moving to smaller divisions, the \(\frac{\text{e}}{\text{min}}\), being twice as fast as a \(\frac{\text{q}}{\text{min}}\), is 120 bpm. The \(\frac{\text{e}}{\text{min}}\), twice again as fast is 240 bpm.

From here, it is useful to understand the triplet and quintuplet divisions of these larger notes. For example, with three \(\frac{\text{h}}{\text{min}}\) occurring in the span of a \(\frac{\text{h}}{\text{min}}\), one multiplies the \(\frac{\text{h}}{\text{min}}\) pulse of 30 by 3, yielding \(\frac{\text{h}}{\text{min}} = 90\) bpm. Likewise, the \(\frac{\text{h}}{\text{min}}\) is found by multiplying the \(\frac{\text{h}}{\text{min}}\) pulse of 60 by 3, for \(\frac{\text{h}}{\text{min}} = 180\) bpm. The same concept is true for quintuplets by multiplying by 5, giving \(\frac{\text{h}}{\text{min}} = 150\) bpm and \(\frac{\text{h}}{\text{min}} = 300\) bpm. Supermetrically, this can be done for the \(\frac{\text{h}}{\text{min}}\) by using the \(\frac{\text{o}}{\text{min}}\) as the base, generating \(\frac{\text{h}}{\text{min}} = 45\) and \(\frac{\text{h}}{\text{min}} = 75\). Finally, by finding the \(\frac{\text{o}}{\text{min}}\) pulse of 120, one can divide that by 3 to produce the \(\frac{\text{e}}{\text{min}}\) = 40, which is three times the duration of an \(\frac{\text{e}}{\text{min}}\). In essence, it is finding the common denominator between metric units, and it is particularly important within complex meter tempos. The chart below shows the regular metric units in the first row, with their submetric diminutions below them.

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Therefore, a larger note, or one of longer value, will have a smaller number of bpm, as there are fewer pulses per minute. Likewise, a faster note will have a larger number of bpm since there are more pulses per minute. This basic concept can be used to self-assess when finding metric relationships to ensure an accurate answer. To clarify, although these pulses are not necessarily the “beat” within the measure, the following numbers will continue to be measured in beats per minute—bpm.

In order to find metric relationships between two tempos, one needs to find the common pulse; that is, the two metric divisions that share the same metronome markings. To do this, it is easiest to list the metric divisions of both tempos and look for a common pulse. If two tempos are obviously related, using a proportion can be useful and time-saving. To find the proportion of the metric relationship, one simply takes the inverse of the tempo proportion. For example, in going from $\text{q}=80$ to $\text{q}=100$, a 4:5 ratio demonstrates that the metric divisions need to be 5:4. Therefore, a $\text{5q}=75$ in the ending tempo (5x80=400) becomes the $\text{q}=60$ pulse of the new tempo (4x100=400). This makes sense since the tempo proportion of 4:5 indicates going to a faster tempo, and a 5:4 metric proportion indicates going to fewer of those same pulses, making the beat shorter, thereby accelerating the tempo.

Once this metric relationship is found, one can mentally prepare the new tempo within the old tempo to make a seamless transition. For example, if the ending tempo is $\text{q}=60$ bpm, and the new tempo is $\text{q}=90$ bpm, we can find that the $\text{3q}$ of the previous tempo is equal to the $\text{q}$ of the new tempo, because 3 times the $\text{q}=60$ pulse of 60 = 180 and 2 times the $\text{q}=90$ pulse of 90 is also 180. Again, this is an example where the tempo proportion of 2:3 generates a metric proportion of 3:2, or $\text{3q}$ to $\text{q}$. If the tempo is going on at 60 bpm, one thinks in triplets, and uses
two of those pulses to become the new beat. Therefore, the previous $\frac{3}{4}$ pulse becomes the new $\frac{1}{2}$ pulse. This requires mental preparation and listening while performing, a skill that needs to be practiced.

The Composer

The topic of tempo modulation on works by Stravinsky is analyzed in this study in part due to his affinity with numbers and his mathematical skills. As Stravinsky said in his Dialogues with Schönberg, “numbers are things.” In Robert Craft’s book compiling some of their conversations, Stravinsky was asked if he regarded musical form in some degree mathematical. He responded, “It is at any rate far closer to mathematics than to literature—not perhaps to mathematics itself, but certainly to something like mathematical thinking and mathematical relationships.” Furthermore, when discussing The Rite of Spring, Stravinsky mentioned within his Chroniques de ma vie, “the most important thing…is the tempos and their ratios, it being impossible to form a notion of the piece without them.” And finally, in speaking about his decision to have some of his pieces transcribed for the Pleyela mechanical piano, he expressed his interest, since “The means enabled me to determine for the future the relationships of the movements (tempi) and the nuances in accordance with my wishes.” These quotes give credence to his intentional use of tempo modulation through metronome markings.

Stravinsky rarely used expression marks, or the term rubato, push and pull of tempo. Metronomic strictness was of the utmost importance. In fact, he stated he desires “metronomic strictness, no rubato. [The] ideal is of mechanical regularity.” To Stravinsky, the score had all

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6 As quoted in Albright, Modernism and Music, 287.
the information a conductor needed; therefore, he wanted a conductor to adhere accurately to the score, not interpret it. In his autobiography, he recalls how well the famous conductor Pierre Monteux conducted Stravinsky’s ballets at their premiers and throughout his life. At one point, Stravinsky mentioned,

[Monteux] was able to achieve a very clean and finished execution of my score [Petrushka]. I ask no more of a conductor, for any other attitude on his part immediately turns into interpretation, a thing I have a horror of. The interpreter of necessity can think of nothing but interpretation, and thus takes on the garb of a translator, traduttore-traditore [translator-traitor]; this is an absurdity in music, and for the interpreter it is a source of vanity inevitably leading to the most ridiculous megalomania.7

Stravinsky was an intentional composer. He composed every day, during normal working hours, sitting at the piano.8 Because of this dedication, regularity, and intentionality, he left very few unfinished works or scraps of ideas.9 This is in stark contrast to frantic, inspiration-driven composers who often leave many ideas and portions of works unfinished like Schoenberg.10 Stravinsky used many meter changes and tempos, so due to his intentionality and emphasis on accuracy, that evidence demonstrates that he intentionally used metric relationships.

Due to surprising and abrasive comments Stravinsky made in his autobiography, he is often infamous for his sentiment on musical expression, which helps give background on how Stravinsky thought.

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9 Ibid.
10 Ibid.
For I consider that music is, by its very nature, essentially powerless to express anything at all, whether a feeling, an attitude of mind, a psychological mood, a phenomenon of nature, etc. … Expression has never been an inherent property of music. That is by no means the purpose of its existence.\footnote{Stravinsky, \textit{An Autobiography}, 53.}

If anything, music was meant to simply express itself, where we as musicians or listeners should not verbally project meaning, affect, and expression outside of the purpose of the music. In 1962, Stravinsky appends this comment in a writing with Craft from \textit{Expositions and Developments}, “It was offhand and annoyingly incomplete, but even the stupider critics could have seen that it did not deny musical expressivity, but only the validity of a type of verbal statement about musical expressivity.”\footnote{As quoted in Albright, \textit{Modernism and Music}, 283.}

Stravinsky’s writings may lead the reader and conductor to conduct these works with strict rhythm and meter, hence the need for accurate tempo modulations. While not all of Stravinsky’s recordings show him with perfectly accurate tempos,\footnote{For more regarding studies on Stravinsky’s recordings, see Erica Heisler Buxbaum. “Stravinsky, Tempo, and \textit{Le Sacre}.” \textit{Performance Practice Review}. 1, no. 1 (1988). Also see a chart of tempo discrepancies across Stravinsky’s recordings in 9. Nicholas Cook, “Stravinsky conducts Stravinsky,” in \textit{The Cambridge Companion to Stravinsky}, ed. Jonathan Cross (Cambridge: Cambridge University Press, 2003), 188.} he felt he could achieve what he wanted by conducting these works. He goes on to mention,

With regard to the \textit{Sacre}, which I was tackling for the first time, I was particularly anxious in some of the parts … to give the bars their true metric value, and to have them played exactly as they were written. I lay stress on this point … [that] most conductors are inclined to cope with the metric difficulties of these passages in such cavalier fashion as to distort alike my music and my intentions.\footnote{Stravinsky, \textit{An Autobiography}, 137.}
Stravinsky saw his recordings as a useful tool to conductors, even authoritative from a performance standpoint. In this way, the recordings can be seen as an expansion of the composition. However, the fact that the tempos in his recordings differed from his score markings has been a point of contention after reading his quotes on metronomic strictness. This does not necessarily negate Stravinsky’s intentional use of tempo modulations or the fact that there was a particular speed and sound he sought to achieve. It rather demonstrates Stravinsky’s humanness as an artist, both through composition and conducting, where he was trying to make two worlds operate in exactly the same way. After more years of experience, Stravinsky realizes,

I have changed my mind … about the advantages of embalming a performance in tape. The disadvantages, which are that one performance presents only one set of circumstances, and that mistakes and misunderstandings are cemented into traditions as quickly and canonically as truths, now seem to me too great a price to pay.\(^\text{16}\)

The Ballets

It is useful to understand the background of these three early ballets and their placement in Stravinsky’s oeuvre, remembering that the reader needs to see these works not through the lens of the late Stravinsky, but of the composer who was developing his style and leading the way in modern music. Sergei Diaghilev began the *Ballet Russes* ballet company in Paris in 1909.\(^\text{17}\) Seeing the talent of young Stravinsky, Diaghilev commissioned him to write a ballet for


\(^{16}\) Stravinsky, *Themes and Conclusions*, 139.

the company. Stravinsky wrote *The Firebird* in 1910, which was a great success on that stage. He then began having thoughts of a puppet named Petrushka, as well as ancient pagan ritual scenes of Russia, which became the themes for his next two ballets. *Petrushka*, which he finished in 1911, was one of the most popular ballets on the Ballet Russes stage. Subsequently, he focused on the more rustic, rhythmically difficult piece, *The Rite of Spring*.

*The Firebird* and *Petrushka* were beautifully choreographed by Mikhail Fokine. *The Rite of Spring* was choreographed by the talented dancer, Vaslav Nijinsky. Nijinsky was the leading dancer from *Petrushka*, and Stravinsky commented through his writings how the brilliant dancer, Nijinsky, was the best Petrushka he had ever seen. However, Stravinsky did not believe Nijinsky was a talented choreographer. As Stravinsky explained, “[Nijinsky’s] ignorance of the most elementary notions of music was flagrant. The poor boy knew nothing of music.”\(^\text{18}\) He never learned musical notation, thereby creating choreography sometimes outside of the musical rhythm, which is difficult in a piece like *The Rite of Spring*. It is because of that choreography and the unsuccessful premier that likely led to Stravinsky professing the work as more of a concert piece, for orchestra alone.

All of the available editions for these three ballets were analyzed in this study. First, three versions of *The Firebird* were analyzed. Of these, the original 1910 edition was studied first, which was scored for a large orchestra and is what is performed when producing the entire ballet.\(^\text{19}\) Stravinsky quickly created a suite in 1911; however, due to its close similarity to the original ballet, it was left out of this study. The 1919 suite was then analyzed, which is a shorter orchestral suite, scored for a more standard orchestra size.\(^\text{20}\) The third version analyzed was the

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\(^{18}\) Stravinsky, *An Autobiography*, 40. To note, this is merely to show Stravinsky’s view of Nijinsky as a choreographer, and not to take away from Nijinsky’s importance in the development of modern dance.


1945 orchestral suite, which is closer to the original ballet in length and content, but again scored for a more standard orchestra.\textsuperscript{21}

Regarding \textit{Petrushka}, the only two editions that exist were analyzed, the original 1911 edition and the revised 1947 edition.\textsuperscript{22} The revised edition is much easier to read and perform as Stravinsky clarified and revised the rhythmic and metric aspects of the work. He had such complex ideas in his head about meter and rhythm which was difficult to express in notation in 1911 as he was leading the way in modern music. By 1947, it appears that he had figured out how to write it more understandably since many figures appear less convoluted. Furthermore, with a background and understanding in law, by writing these revised works, he was able to obtain proper royalties to works that had previously been complicated by Russian copyright laws.

\textit{The Rite of Spring} has a more complicated editorial past. The first published edition from 1922 was reviewed, which differs slightly from the edition used for the premier.\textsuperscript{23} Monteux conducted from Stravinsky’s original manuscript at the first performance in 1913, but Stravinsky continued to revise passages until it was published in 1922. He had been pressed for time to get it ready for the premier, and so there were many errors. Over time, Stravinsky and others corrected them for various editions. The revised 1947 edition published by Boosey & Hawkes was also analyzed.\textsuperscript{24} The final edition is the 2000 edition, published by Kalmus and edited by Philadelphia Orchestra librarian Clint Nieweg, which is considered to be the edition that has corrected the most errata.\textsuperscript{25}

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\textsuperscript{24} Igor Stravinsky, \textit{The Rite of Spring: Revised 1947} (New York: Boosey & Hawkes Music Publishers Ltd., 1997).
\end{flushright}
Methodology

The methodology to complete this survey was to study and compare credible resources on Stravinsky, tempo modulation, and modern music performance. The various scores of Stravinsky’s three ballets and orchestral suites were studied. Through the study of these ballets, each tempo change was analyzed that occurs contiguously with another passage, generally without pause, ritardando, or accelerando. The mathematics of tempo modulation was used to find any metric relationships, and determine how passages can be navigated using this technique. The results were collected to show how often a solution can be found, as well as to demonstrate the pivot relationships. Implications and conclusions were drawn to determine how consistently and effectively tempo modulations are used in these ballets. That information can be employed by conductors, choreographers, musicians, and dancers to make tempo transitions accurately.

For the purpose of this study, parameters were determined regarding whether or not a tempo modulation was considered successful or not, based on an acceptable margin of error. While a sliding proportional scale may have been more accurate, the following parameters were adequate for this study. When a relationship was using durations less than 60 bpm, it needed to be within 2 bpm. Between 60 and 120 bpm, it needed to be within 4 bpm. Between 120 and 240 bpm, it could be plus or minus 6 bpm. Anything related between 240 and 480 bpm needed to be within 8 bpm, and anything above 480 bpm within 16 bpm, since at that speed, a gap of 16 bpm is quite indiscernible.

Musical Examples

The following examples depict various instances of tempo relationships within the three ballets in this study. These results show the tempo relationships as well as how to pivot from the previous tempo to the new tempo. For a full list of each tempo transition, see Appendix A. In The Rite of Spring, from the “Spring Rounds” through the “Ritual of the Two Rival Tribes,” there are three tempo transitions. First, the initial tempo is \( \frac{\dot{1}}{\dot{2}} = 108 \) going to \( \frac{\dot{1}}{\dot{2}} = 80 \). To get there, one finds the \( \dot{1} \) of the old tempo, which is \( \dot{1} \) of 108 divided by 2=54bpm, then multiplying that
by 3, the \( \frac{3}{4} = 162 \). The \( \frac{1}{4} \) of the new tempo, which is \( \frac{1}{4} = 80 \times 2 \), is 160, so the \( \frac{3}{4} \) of the old tempo equals the \( \frac{1}{4} \) of the new tempo, as seen below. Therefore, in the last \( \frac{1}{4} \), one thinks in triplets, and two of those pulses become the new beat.

<table>
<thead>
<tr>
<th>Previous Tempo</th>
<th>New Tempo</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{1}{4} = 108 )</td>
<td>( \frac{1}{4} = 80 )</td>
</tr>
<tr>
<td>( \frac{1}{4} = 54 )</td>
<td>( \frac{1}{4} = 160 )</td>
</tr>
<tr>
<td>( \frac{3}{4} = 162 )</td>
<td></td>
</tr>
</tbody>
</table>

In the second transition, the \( \frac{1}{4} \) still equals 80, and the new tempo is \( \frac{1}{4} = 160 \). Easily enough, the \( \frac{1}{4} \) of the previous tempo also equals 160. This of course is a simple example of doubling the speed. In the third transition, the \( \frac{1}{4} \) goes from 160 to \( \frac{1}{4} = 108 \). The \( \frac{1}{4} \) in the old tempo, \( \frac{1}{4} \) of 160 \( \times 2 \), is 320 bpm; and the \( \frac{3}{4} \) of the new tempo, \( \frac{1}{4} \times 3 = 324 \), well within the parameters identified above. So from the old tempo, the conductor can take the \( \frac{1}{4} \) pulse and give three of those pulses to the new beat, slowing it down proportionally.

A second excerpt within *The Rite of Spring* occurs between “The Sage” and “Dance of the Earth.” The tempo of “The Sage” is \( \frac{1}{4} = 42 \), going to \( \frac{1}{4} = 168 \). The \( \frac{1}{4} \) in the old tempo, multiplying the \( \frac{1}{4} \) by 4, is exactly 168. Therefore, one mentally audiates or subdivides the \( \frac{1}{4} \), which becomes the new beat. This is an example of where Buxbaum describes a discrepancy in what Stravinsky originally notated versus what he preferred through his critiques of various recordings.\(^{26}\) Based on her analysis, Stravinsky found “The Sage” tempo to be too fast. Even though his recording was exactly correct, he still noted it to be too fast; and the other tempos, which were between 52-58, were nearly twice too fast according to his subjective critiques. Furthermore, the tempos of “Dancing of the Earth” were all under tempo, but the recording at 160 was considered the best. While the discussion above may be tangential to this study, it is important for conductors to realize the difference composers may feel between being “in the

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moment” of live music versus sitting down to write the music that is within the composer’s mind.

Within the “Mystic Circle of the Adolescents,” the \( \frac{3}{4} \) shifts from 60bpm to 80bpm. This is a straightforward transition since the \( \frac{3}{4} \) of the old tempo is 240 bpm, and the \( \frac{5}{4} \) of the new tempo is also 240. So by subdividing the previous pulse into four, three of those pulses become the new tempo, speeding up the tempo at a ratio of 4:3.

There is an interesting revision within Petrushka, seen at the beginning of the Third Tableau. In the original 1911 edition, the first tempo change goes from \( \frac{3}{4} = 144 \) to \( \frac{3}{4} = 112 \), with the relationship being 5:4. Therefore, the \( \frac{3}{4} \) from the previous tempo equals the \( \frac{5}{4} \) note of the new tempo. The next transition, goes from \( \frac{3}{4} = 112 \) to \( \frac{3}{4} = 48 \). There is no tempo transition within the parameters, which can be seen in the figure below.

\[ \begin{align*}
\text{Previous Tempo} & \quad \frac{3}{4} = 144 & \quad \frac{3}{4} = 168 & \quad \frac{3}{4} = 224 & \quad \frac{3}{4} = 280 & \quad \frac{3}{4} = 336 & \quad \frac{3}{4} = 448 & \quad \frac{3}{4} = 560 \\
\text{New Tempo} & \quad \frac{3}{4} = 48 & \quad \frac{3}{4} = 96 & \quad \frac{3}{4} = 144 & \quad \frac{3}{4} = 192 & \quad \frac{3}{4} = 240 & \quad \frac{3}{4} = 384 & \quad \frac{3}{4} = 560
\end{align*} \]

This example was chosen because in the revised 1947 edition, the opening of this tableau only has one tempo change instead of the two changes, which included an unrelated transition. In the revised version, this section begins at \( \frac{3}{4} = 126 \), modulating to \( \frac{3}{4} = 96 \). This relationship has the \( \frac{3}{4} \) (\( \frac{3}{4} \) of 63 x 3=189) being equal to the new \( \frac{3}{4} = 192 \). This is clearly an easier and more accurate transition than in the original version, showing an intentional and helpful revision. The subsequent tempo change is much more precise. The tempo goes from \( \frac{3}{4} = 48 \) to \( \frac{3}{4} = 144 \), where the \( \frac{3}{4} \) of the previous tempo (multiplying the \( \frac{3}{4} \) by 3=144) becomes the new pulse. Stravinsky gives the second trombone and tuba \( \frac{3}{4} \) leading into the new tempo, as is seen in the example below. One can take that pulse and make that the new \( \frac{3}{4} \).
The final transition goes back from 144 to 48, where the \( \frac{3}{4} \) of the new tempo is also 144. So three of the previous beats become the new beat, returning to \( \frac{3}{4} \) = 48.

One other section of note in Petrushka is in the Fourth Tableau, between rehearsals 121-123. At rehearsal 121, the tempo changes from \( \frac{3}{8} \) = 112 to a 5/8 measure=72 (or a \( \frac{3}{8} \) plus a \( \frac{3}{4} \)). To execute this modulation, one can determine that the \( \frac{3}{8} \) of the old tempo, which is the \( \frac{3}{4} \) of 224 divided by 3, equaling 74.7. Therefore, one takes the last three eighth notes of the preceding measure, which becomes the new 5/8 measure pulse. Stravinsky then goes between 5/8 and 6/8, then back again to 5/8, where the measure pulse remains at 72bpm in each measure. At rehearsal 123, the modulation goes from 5/8=72 to \( \frac{3}{8} \) = 180. To find this, it is helpful to determine the length of the \( \frac{3}{4} \) in the previous tempo, or 72 x 5=360bpm. This is equal to the \( \frac{3}{4} \) of the new tempo; therefore the \( \frac{3}{4} \) pulse remains the same through this transition.

Regarding The Firebird, more focus is given to the 1919 Suite, which is more widely performed. The opening of the ballet has a starting tempo of \( \frac{3}{4} \) = 108, modulating to the new tempo of \( \frac{3}{4} \) = 152. Dividing the old tempo by three, the \( \frac{3}{4} \) = 36. Dividing the new tempo by four, \( \frac{3}{4} \) =38. Since the old tempo can be conducted with the \( \frac{3}{4} \), at this tempo change half of that large beat becomes the new measure. A bit later, the tempo goes from \( \frac{3}{4} \) = 152 to \( \frac{3}{4} \) = 76. This is an easy change, since the \( \frac{3}{4} \) of the old tempo, or the entire measure since it is written in 2/4, is 76,

\[ ^{27} \text{Stravinsky, Petrushka (Dover), 81.} \]
equal to the new pulse. During the fermata pause, the conductor can take the measure pulse to be the new beat in 6/8.

The section of the “Khorovode,” or the Princess’s Round Dance, contains some interesting issues. It goes back and forth between $\frac{5}{4}$ and $\frac{3}{4}$. This is an example of a 5:4 relationship. The $\frac{5}{4}$ note of the former tempo is $72 \times 5 = 360$. The $\frac{3}{4}$ of the tempo at 92 bpm is 368. This can be considered a successful modulation by taking four of the previous quintuplets to be the new, faster beat. However, Stravinsky’s own recordings of this movement have him taking substantially different tempos than either of these markings. Furthermore, towards the end of the movement, he goes from $\frac{3}{4}$ to “approximately” $\frac{3}{4}$ = 58. This is the only instance in these three ballets that he uses the term environ, or approximately, leading one to believe one could play around with the tempo. This may be an instance where either he never quite settled on how to write it in the scores, or whenever he went to conduct it, he felt it, or “interpreted” it, differently. In this final transition, the relationship shows that the old $\frac{3}{4}$ of 184 is environ the new $\frac{3}{4}$ of 174.28

A final example from The Firebird that contains a set-up that facilitates a successful transition comes from the original 1910 edition. The previous tempo is $\frac{3}{4}$ = 63, going to $\frac{3}{4}$ = 168. The thirty-second note of the previous tempo ($63 \times 8$) is 504 and the $\frac{3}{4}$ of the new tempo, $168 \times 3$, is exactly 504. As seen below, in the final measure of the previous tempo, violins have thirty-second notes, followed by $\frac{3}{4}$ in the new tempo, both of which have the same speed. With practice, the conductor and performers can easily use this as a means of navigating this wide tempo transition with accuracy and consistency.

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Results

After tabulating all the tempo transitions in each of the ballet scores, a high percentage of related modulations emerged. The table below shows the edition used in the first column. The second column shows how many tempo changes there were within the aforementioned parameters. The third column shows the number of tempo changes with successful relationships, and their percentage to the total. The last block shows the number of tempo changes with successful set-ups and their percentages.

Figure 5. Table of results.

<table>
<thead>
<tr>
<th></th>
<th>Total within parameters</th>
<th>With relationship</th>
<th>%</th>
<th>With set-up</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrushka 1911</td>
<td>42</td>
<td>31</td>
<td>73.8%</td>
<td>22</td>
<td>71.0%</td>
</tr>
<tr>
<td>Petrushka 1947</td>
<td>33</td>
<td>27</td>
<td>81.8%</td>
<td>25</td>
<td>92.6%</td>
</tr>
<tr>
<td>The Firebird 1910</td>
<td>32</td>
<td>27</td>
<td>84.4%</td>
<td>25</td>
<td>92.6%</td>
</tr>
<tr>
<td>The Firebird Suite 1919</td>
<td>6</td>
<td>5</td>
<td>83.3%</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>The Firebird Suite 1945</td>
<td>12</td>
<td>9</td>
<td>75.0%</td>
<td>9</td>
<td>100.0%</td>
</tr>
<tr>
<td>The Rite of Spring</td>
<td>20</td>
<td>18</td>
<td>90.0%</td>
<td>15</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

29 Stravinsky, The Firebird (Dover), 100.
The Rite of Spring is only listed once, as each edition contains the same meter changes. Throughout its revisions, Stravinsky did not change the meters or metronome markings. In Petrushka, his 1947 revision reduced the number of tempo changes, and increased the percentage that have relationships and set-ups, as in the aforementioned example. The Firebird suites have fewer tempo changes as well, since they are shorter than the entire ballet, but still have a large percentage of relationships and set-ups.

In general, tempos that had a difference of less than 15 bpm did not have tempo relationships, as they were too close together to find any helpful proportional pivot point. The average percentages of tempo changes having relationships for each set is 77.8% for Petrushka; 80.9% for The Firebird; and 90% for The Rite of Spring, for an overall average of 82.9%. Also, 92.7% of the time, there was some kind of set-up in order to make the transition possible.

Conclusion

While not every tempo change had a relationship or set-up, an average of 83% of the changes did. Furthermore, later revisions generally had more relationships, suggesting that Stravinsky had a growing tendency towards using them. In the case of The Rite of Spring, this work had the highest percentage of transitions, which is fitting based on Stravinsky’s writings and declarations. He notes how metrically accurate the work needs to be performed and even goes so far as to mention the existence of tempo ratios and relationships. Finally, some of the relationships appear to have such obvious set-ups, that they help to demonstrate his knowledge of tempo modulations and use of mathematics in this way.

For further research, Stravinsky’s other ballets can be analyzed for tempo relationships as well. Someone with an advanced mathematical background could likely generate a formula or algorithm to find the relationships between two tempos, taking into account the multiple variables involved. At the very least, a chart or table could be constructed to list many of the common relationships for standard tempos.
It is worth the time to discern tempo relationships within Stravinsky’s works as it assists conductors and choreographers in study, rehearsal, and performance. Conductors can use the following appendix to aid in studying and performing these ballets. This practice can also be applied to other recent composers. This concept can aid in having consistency in the concert hall, and particularly in ballet where consistency is a necessity. It is also helpful in understanding more about who Stravinsky was, along with his philosophy, intentions, and personality. While this is not necessarily a hard and fast rule that all conductors need to take, it is another tool conductors take into score study, performance, and musical understanding that can be employed at the discretion of the conductor.
Appendix

This appendix shows all tempo transitions within the aforementioned parameters for each edition of these three ballets. This excludes tempo transitions that are preceded by significant accelerando, ritardando, section breaks, or tempo headings without metronomic indication. Note, *The Firebird* 1911 Suite was omitted due to its similarity to the original ballet. Also, *The Rite of Spring* is only listed with one chart as all existing editions have the same tempo transitions. The main reasons for further editions were to correct errata, as well as gain royalty rights.

**The Firebird, original 1910 edition**

<table>
<thead>
<tr>
<th>Section</th>
<th>Rehearsal #</th>
<th>Previous Tempo</th>
<th>New Tempo</th>
<th>Relationship</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (^a)</td>
<td>(\frac{\pi}{2}) = 108</td>
<td>(\frac{\pi}{2}) = 36</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>Divide last (\frac{\pi}{2}) in 5, use three to new (\frac{\pi}{2})</td>
</tr>
<tr>
<td>3</td>
<td>(\frac{\pi}{2}) = 108</td>
<td>(\frac{\pi}{2}) = 144</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>(\frac{\pi}{2}) = 144</td>
<td>(\frac{\pi}{2}) = 54</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>(\frac{\pi}{2}) = 54</td>
<td>(\frac{\pi}{2}) = 88</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>(\frac{\pi}{2}) = 80</td>
<td>(\frac{\pi}{2}) = 69</td>
<td>NO</td>
<td>Double time</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>(\frac{\pi}{2}) = 72</td>
<td>(\frac{\pi}{2}) = 144</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>Half time</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>(\frac{\pi}{2}) = 144</td>
<td>(\frac{\pi}{2}) = 72</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>(\frac{\pi}{2}) = 72</td>
<td>(\frac{\pi}{2}) = 54</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>Think (\frac{\pi}{2}) in last (\frac{\pi}{2}), use 4 of those in new beat</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>(\frac{\pi}{2}) = 84</td>
<td>(\frac{\pi}{2}) = 84</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>(\frac{\pi}{2}) = 84</td>
<td>(\frac{\pi}{2}) = 52</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>(\frac{\pi}{2}) = 52</td>
<td>(\frac{\pi}{2}) = 72</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>(\frac{\pi}{2}) = 72</td>
<td>(\frac{\pi}{2}) = 92</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>(\frac{\pi}{2}) = 72</td>
<td>(\frac{\pi}{2}) = 92</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>(\frac{\pi}{2}) = 50</td>
<td>(\frac{\pi}{2}) = 120</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>(\frac{\pi}{2}) = 120</td>
<td>(\frac{\pi}{2}) = 120</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>(\frac{\pi}{2}) = 120</td>
<td>(\frac{\pi}{2}) = 80</td>
<td>(\frac{\pi}{2}) = (\frac{\pi}{2})</td>
<td>(\frac{\pi}{2}) pulse remains the same</td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>Pulse</td>
<td>Previous Pulse</td>
<td>New Pulse</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
<td>----------------</td>
<td>-----------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>Pulse remains the same</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>80</td>
<td>63</td>
<td>5</td>
<td>Add one more of previous 5 to get new pulse</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>63</td>
<td>168</td>
<td>3</td>
<td>3 used in previous measure, new measure has 3</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>168</td>
<td>63</td>
<td>3</td>
<td>Use last two beats to make 3, use 4 in new beat</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>100</td>
<td>50</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>118 -1/3</td>
<td>50</td>
<td>76</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>76</td>
<td>152</td>
<td>3</td>
<td>No helpful setup</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>152</td>
<td>168</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>168</td>
<td>152</td>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>169</td>
<td>168</td>
<td>84</td>
<td>84</td>
<td>Use last two beats to become new measure (in 3)</td>
<td></td>
</tr>
<tr>
<td>182</td>
<td>84</td>
<td>60</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>190</td>
<td>138</td>
<td>46</td>
<td>3</td>
<td>Use 3 previous beats to be new beat</td>
<td></td>
</tr>
<tr>
<td>191</td>
<td>46</td>
<td>92</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>195</td>
<td>92</td>
<td>72</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>197</td>
<td>72</td>
<td>54</td>
<td>3</td>
<td>Subdivide beat into 3, use 4 in new beat</td>
<td></td>
</tr>
<tr>
<td>206</td>
<td>208</td>
<td>104</td>
<td>104</td>
<td>Half time</td>
<td></td>
</tr>
</tbody>
</table>
The Firebird, 1919 Suite

<table>
<thead>
<tr>
<th>Section</th>
<th>Rehearsal #</th>
<th>Previous Tempo</th>
<th>New Tempo</th>
<th>Relationship</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro</td>
<td>6</td>
<td>6(\cdot)=108</td>
<td>6(\cdot)=152</td>
<td>6(\cdot)=(\cdot)</td>
<td>Conduct last measure in 6(\cdot). Half of those beats is new 6(\cdot).</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>6(\cdot)=152</td>
<td>6(\cdot)=76</td>
<td>6(\cdot)=(\cdot)</td>
<td></td>
</tr>
<tr>
<td>Ronde</td>
<td>2</td>
<td>6(\cdot)=72</td>
<td>6(\cdot)=92</td>
<td>5(\cdot)=(\cdot)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>6(\cdot)=72</td>
<td>6(\cdot)=92</td>
<td>5(\cdot)=(\cdot)</td>
<td></td>
</tr>
<tr>
<td>Berceuse/Final</td>
<td>11</td>
<td>6(\cdot)=60</td>
<td>6(\cdot)=54</td>
<td>NO</td>
<td>Pulse just slows a bit</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>6(\cdot)=208</td>
<td>6(\cdot)=104</td>
<td>6(\cdot)=(\cdot)</td>
<td>Half time</td>
</tr>
</tbody>
</table>

The Firebird, 1945 Suite

<table>
<thead>
<tr>
<th>Section</th>
<th>Rehearsal #</th>
<th>Previous Tempo</th>
<th>New Tempo</th>
<th>Relationship</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro</td>
<td>6</td>
<td>6(\cdot)=108</td>
<td>6(\cdot)=152</td>
<td>6(\cdot)=(\cdot)</td>
<td>Conduct last measure in 6(\cdot). Half of those beats is new 6(\cdot).</td>
</tr>
<tr>
<td></td>
<td>9</td>
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<td>do last 4 measure in 1, subdivide in 3(\cdot) which are new (\cdot)</td>
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<tr>
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<td>Half time</td>
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**Petrushka, original 1911 edition**

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<tr>
<th>Section</th>
<th>Rehearsal #</th>
<th>Previous Tempo</th>
<th>New Tempo</th>
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<th>Notes</th>
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<td>7</td>
<td>♩ =138</td>
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<td>Notation at the beginning is quite convoluted</td>
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<td>While the 7/8 modulations are mathematically correct, they have no set-ups</td>
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<td>Value</td>
<td>Value</td>
<td>Value</td>
<td>Tromb have ( \frac{3}{4} ) bars, which becomes new beat</td>
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Last measure is in \(\frac{3}{4}\), new measure is in \(\frac{5}{4}\); measure pulse stays same in the midst of time sig change
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<th>Previous Tempo</th>
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<th>Relationship</th>
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<td>Measure before is ¾, which becomes ♩</td>
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<td>Same measure pulse to the ( \frac{1}{2} )</td>
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<td>( \frac{1}{2} ) = ( \frac{1}{2} )</td>
<td>Half time</td>
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**The Rite of Spring**

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<th>Section</th>
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<td>( \frac{1}{2} ) = ( \frac{1}{2} )</td>
<td>Double time</td>
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<td>( \frac{1}{2} ) =132</td>
<td>( \frac{1}{2} ) = ( \frac{1}{2} )</td>
<td>Mentally subdivide ( \frac{5}{8} ), use 3 in new beat</td>
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<td></td>
<td>49</td>
<td>( \frac{1}{2} ) =108</td>
<td>( \frac{1}{2} ) =80</td>
<td>( \frac{3}{8} ) = ( \frac{3}{8} )</td>
<td>Split ( \frac{1}{2} ) in ( \frac{3}{8} ), use as ( \frac{3}{8} ) pulse</td>
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<td>54</td>
<td>( \frac{1}{2} ) =80</td>
<td>( \frac{1}{2} ) =160</td>
<td>( \frac{3}{8} ) = ( \frac{3}{8} )</td>
<td>Double time</td>
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<td>( \frac{1}{2} ) =108</td>
<td>( \frac{3}{8} ) = ( \frac{3}{8} )</td>
<td>Use 3 ( \frac{3}{8} ) from previous for new beat</td>
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<td>57</td>
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<td>( \frac{1}{2} ) =166</td>
<td>( \frac{3}{8} ) = ( \frac{3}{8} )</td>
<td>Split last beat in 3, use 2 for new pulse</td>
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<td>72</td>
<td>( \frac{1}{2} ) =42</td>
<td>( \frac{1}{2} ) =168</td>
<td>( \frac{3}{8} ) = ( \frac{3}{8} )</td>
<td></td>
</tr>
<tr>
<td>Part 2</td>
<td>89</td>
<td>( \frac{1}{2} ) =48</td>
<td>( \frac{1}{2} ) =60</td>
<td>( \frac{5}{8} ) = ( \frac{5}{8} )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>( \frac{1}{2} ) =60</td>
<td>( \frac{1}{2} ) =48</td>
<td>( \frac{5}{8} ) = ( \frac{5}{8} )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>91</td>
<td>( \frac{1}{2} ) =48</td>
<td>( \frac{1}{2} ) =60</td>
<td>( \frac{5}{8} ) = ( \frac{5}{8} )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>93</td>
<td>( \frac{1}{2} ) =60</td>
<td>( \frac{1}{2} ) =80</td>
<td>( \frac{5}{8} ) = ( \frac{5}{8} )</td>
<td></td>
</tr>
</tbody>
</table>

The Rite of Spring Section Rehearsal Previous Tempo New Tempo Relationship Notes
<table>
<thead>
<tr>
<th>Measure</th>
<th>Quarter Note</th>
<th>Eighth Note</th>
<th>Third Note</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>97</td>
<td>80</td>
<td>60</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>120</td>
<td>144</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>121</td>
<td>144</td>
<td>144</td>
<td>2</td>
<td>Double time</td>
</tr>
<tr>
<td>128</td>
<td>144</td>
<td>52</td>
<td>3</td>
<td>Last measure is in $\frac{3}{4}$, that measure becomes half of new beat</td>
</tr>
<tr>
<td>142</td>
<td>52</td>
<td>126</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>174</td>
<td>126</td>
<td>126</td>
<td>2</td>
<td>Double time</td>
</tr>
<tr>
<td>180</td>
<td>126</td>
<td>126</td>
<td>3</td>
<td>Half time</td>
</tr>
<tr>
<td>181</td>
<td>126</td>
<td>126</td>
<td>3</td>
<td>Double time</td>
</tr>
<tr>
<td>186</td>
<td>126</td>
<td>126</td>
<td>3</td>
<td>Half time</td>
</tr>
</tbody>
</table>
Bibliography


Index to CODA Journal, Volumes I-XI


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    Chamber Orchestra
    College-community Orchestras
  New works
    Composer perspectives
    Little-known works
    Arranging/editing music

Conducting
  Conducting problems in major works (a la Max Rudolf)
  Technique
  Score study
Development and maintenance

Research
   Historical
   Annotated listings
   Composers
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   Auditioning
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If accepted, the article will be published in the appropriate section, depending on its inherent nature.

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