

THE AMERICAN PEDAGOGY  
OF BYZANTINE CHANT

by  
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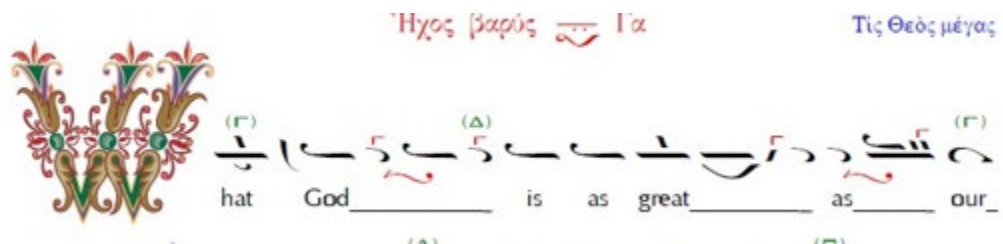
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## Glossary of Terms

- flow phonation:** The highest possible air flow with sufficient glottal closure.<sup>1</sup>
- flow finger:** A semi-occluded vocal tract posture which is used to encourage flow phonation increasing breath flow and widening the glottis. The singer places an index finger against their lips and blows air allowing the cheeks to puff out. At the same time, the singer produces a pitch, usually the one they are about to sing.
- glottal stop:** A form of plosive in which the closure is made by bringing the vocal folds together, as when holding one's breath.<sup>2</sup>
- glottis:** The opening between the vocal folds.
- harmonics:** Positive integer multiples of the fundamental frequency, if the fundamental is 10 Hz, then the second harmonic would be 20 Hz, and the third harmonic would be 30 Hz, and so on.
- hirmologic:** Style of Byzantine chant that has one note per syllable.
- ison:** A drone tone produced while the melody is being sung. It is usually one of the structural notes of the scale. It is shown above the staff in the following example, telling the ison singer to sing Γ and Δ respectively:



<sup>1</sup> Gauffin and Sundberg, "Spectral Correlates of Glottal Voice Source Waveform Characteristics."

<sup>2</sup> Hughes, Trudgill, and Watt, *English Accents and Dialects: An Introduction to Social and Regional Varieties of English in the British Isles*, 42.

- papadic:** Style of Byzantine chant that is mostly melismatic.
- pressed phonation:** A high subglottal pressure is accompanied by a low glottal flow.<sup>3</sup>
- sticheraric:** Style of Byzantine chant that has mostly one note per syllable, but also some moments of multiple notes per syllable.
- subglottic pressure:** the air pressure beneath the glottis

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<sup>3</sup> Proutskova et al., "Breathy or Resonant - A Controlled and Curated Dataset for Phonation Mode Detection in Singing - Goldsmiths Research Online."

## Introduction

The following document is written with two different communities in mind: the voice/voice science community and the byzantine chant community, including clergy and laity. This project began with the desire to learn about the pedagogy of Byzantine chant and to aid the byzantine chant community to achieve a sustainable voice practice. Another intention of this work is to help the voice community to gain knowledge about the pedagogy and function of the voice in a style of music which has yet to be studied.

The Byzantine chant tradition is almost as old as Christianity itself; as such, varying styles exist within this tradition that developed over time due to physical distance i.e., the Athonite tradition vs. the Constantinopolitan tradition. The focus of this document will be on a mixture of these styles as they occur in America. Despite the long history of this musical tradition and its rich beauty and depth, it lacks the knowledge of the voice and voice pedagogy that other musical traditions have acquired over time. As a result, many practitioners of this musical style, also known as cantors or psalti, complain of vocal fatigue. In my time as a professional vocalist, vocologist, and teacher there have been several people who have approached me with claims of vocal fatigue while chanting. Additionally, I have also heard of cantors outside of my personal sphere who experienced the same problem. One such example is Papa Ephraim, who is very well known in the Orthodox Christian community for his compositions of Byzantine hymns in English. During an interview for the podcast *A Sacrifice of*

*Praise*,<sup>4</sup> Papa Ephraim mentioned that he found his voice growing very tired from regularly chanting. Accordingly, he sought the help of a professional Western voice teacher and found that after studying and implementing the voice technique of the Western music tradition, his fatigue was eradicated. He also mentions that, despite learning vocal technique through a different music tradition, Western music, he was able to adapt it to his chant style without a problem. Unfortunately, most cantors do not seek lessons from what they dub a “Western style” voice teacher either because they fear it will hinder their ability to sing in the Byzantine chant style or because they are unaware that studying with a voice teacher is possible. This is especially troubling because psalti are required to use their voices on a large variety of repertoire and, at certain times of year, much more frequently than many opera singers.<sup>5</sup> As a result, any issues with their vocal health can be extremely detrimental to their overall longevity.

The aim of this study was to discover the cause of vocal fatigue among practitioners of Byzantine chant and to offer possible solutions to this problem as an aid to the overall vocal health of the chant community. Before beginning the discussion of the study, I would like to point out that vocal fatigue is often a sign of pressed phonation and/or vocal inefficiency. As I listened to Byzantine chant, I suspected that some practitioners were not using their resonance and breath flow to project their sound, but instead, pressed phonation. According to internationally known speech-language pathologists, Verdolini et al, “...resonant voice is defined as a voicing pattern involving oral vibratory sensations, particularly on the alveolar

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<sup>4</sup> Richard Barrett and Amy Hogg, “Composer Spotlight: Papa Ephraim,” MP3 Audio, *A Sacrifice of Praise*, accessed April 10, 2022, [https://www.ancientfaith.com/podcasts/sacrificeofpraise/composer\\_spotlight\\_papa\\_ephraim\\_part\\_1](https://www.ancientfaith.com/podcasts/sacrificeofpraise/composer_spotlight_papa_ephraim_part_1).

<sup>5</sup> During important liturgical periods such as Great Lent, psalti must chant in many services and with a greater variety of repertoire.

ridge and adjacent facial plates, in the context of what subjects perceive as "easy" phonation."<sup>6</sup> If practitioners of Byzantine chant are not perceiving "easy" phonation, but instead experiencing fatigue, it is possible that they are not singing in the most efficient and healthy way. The following document will therefore include a perceived phonatory effort and acoustical analysis of the audio recordings of two different cantors (one male and one female), as well as information about the training that each cantor received and the training of their teacher.

Since this document is intended for two different communities, the first chapter is dedicated to the history of Byzantine chant. The subsequent chapters will explain perceived phonatory effort, pressed phonation, vocal efficiency, and include an analysis of the acquired recordings as well as a discussion of the pedagogy from the interviews that were conducted during the study.

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<sup>6</sup> Katherine Verdolini et al., "Laryngeal Adduction in Resonant Voice," *Journal of Voice* 12, no. 3 (January 1, 1998): 315–27, [https://doi.org/10.1016/S0892-1997\(98\)80021-0](https://doi.org/10.1016/S0892-1997(98)80021-0).

## Chapter One: A Brief History of Byzantine Chant

The rich history of Byzantine chant is generally unknown to the average musician. This is mostly due to the fact that the history of Western music is deeply rooted in Gregorian chant and not its Eastern brother. Due to its interesting musicological possibilities, however, the history of Byzantine chant has been thoroughly researched and expounded upon in many scholarly articles, books, and student dissertations. As a result, the aim of this document is not to discuss its history, but rather to investigate the potential cause of vocal fatigue in cantors and the pedagogical tradition among cantors and their students. A general knowledge of the history of Byzantine chant is required to understand its pedagogy, therefore this document begins with a brief history of Byzantine chant.

Firstly, it is more accurate to call this tradition the “Psaltic Art” as musicians of the Byzantine empire called it thusly,<sup>7</sup> however, for the sake of consistency and clarity, this document will continue to use the terminology “Byzantine chant.” Byzantine chant is largely a monophonic singing style that is sung with a nearly straight tone<sup>8</sup> and occasional flutters to ornament the musical line. “The Psaltic Art is *strictly vocal*,”<sup>9</sup> as there are no instruments used in the Eastern Orthodox Church.<sup>10</sup> This was repeatedly supported by the Church Fathers,

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<sup>7</sup> Dr. Grammenos Karanos, “Introduction: A Brief Overview of the Psaltic Art,” in *Byzantine Music: Theory and Practice Guide*, First (8 East 79th Street, New York, New York: Greek Orthodox Archdiocese of America, 2011), iv.

<sup>8</sup> St. Antony’s Greek Orthodox Monastery, “Introduction to the Divine Music Project,” St. Anthony’s Greek Orthodox Monastery, 6, accessed April 10, 2022, <https://stanthonysonastery.org/pages/introduction-to-the-divine-music-project>.

<sup>9</sup> Dr. Grammenos Karanos, “Introduction: A Brief Overview of the Psaltic Art,” iv.

<sup>10</sup> Organs *can* be found in Greek churches in the diaspora, but this is an Americanization and not the true musical tradition of the Greek church.

influential theologians, and often saints<sup>11</sup> who believed that the “human voice is the best, most refined of all musical instruments.”<sup>12</sup> The Church Fathers used writings related to the scriptures to support their ideas. One example of this comes from St. Nicodemus who stated that, “as He (God) said through Amos: ‘Remove from me the sound of thy songs, and I will not hear the music of thine instruments’ - thenceforth we Christians execute our hymns only with the voice.”<sup>13</sup> As a result of such arguments, Byzantine chant remains unaccompanied to this day.

To further understand this musical tradition, the following recording of the monks of Holy Transfiguration Monastery is provided to introduce the sound world of Byzantine chant to the reader: “[What God is as Great as Our God.](#)”<sup>14</sup> One notable part of this performance is that it does not exhibit a purely monophonic sound. This is due to the presence of the ison,<sup>15</sup> or drone tone, which was added to Byzantine chant around 1584.<sup>16</sup> The ison provides a richness and depth to the performance without impeding the listener’s ability to understand the text. In the Orthodox Church, music is used “as a means to express and illuminate the meaning of the text.”<sup>17</sup> Text intelligibility is the key reason for the long enduring monophony of this tradition. Other Eastern Orthodox traditions do however, practice homophony, i.e., the choral settings of the Russian Orthodox Church. There are traditionally no polyphonic examples which would

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<sup>11</sup> “Church Fathers,” OrthodoxWiki, accessed April 10, 2022, [https://orthodoxwiki.org/Church\\_Fathers](https://orthodoxwiki.org/Church_Fathers).

<sup>12</sup> Constantine Cavarnos, *Victories of Orthodoxy* (Belmont, Massachusetts: Institute for Byzantine and Modern Greek Studies, 1997), 70–71.

<sup>13</sup> St. Antony’s Greek Orthodox Monastery, “Introduction to the Divine Music Project,” 5.

<sup>14</sup> The Monks of Holy Transfiguration Monastery, *What God Is as Great as Our God?*, MP3 Audio, O Give Thanks Unto the Lord (Holy Transfiguration Monastery, Brookline, MA, 2015).

<sup>15</sup> The ison is a pillar note of the scale which is intoned while the melody line is being sung. It is often the primary note that the melody is moving around.

<sup>16</sup> Dimitri E. Conomos, “History of Byzantine Chant,” St. Anthony’s Greek Orthodox Monastery, accessed April 10, 2022, <https://stanthonysmonastery.org/pages/history-of-byzantine-chant>.

<sup>17</sup> Dr. Grammenos Karanos, “Introduction: A Brief Overview of the Psaltic Art,” v.

cause the text to become unintelligible. The significance of text in vocal music is not unique to Byzantine chant; instead, it is ubiquitous among most vocal styles. Any classical singer or teacher would say the same about music which has been set to the texts of great writers such as Goethe and Da Ponte.

As a result of the importance of text and the emphasis placed on only using the human voice in the church, vocal music was integral to the services of Christian worship from the beginning. Growing out of this, the chant of the Eastern Orthodox Church began in ancient Byzantium with the development of Constantinople in 330 A.D.<sup>18</sup> At this time it, “became the site of Roman Emperor Constantine’s ‘New Rome,’ a Christian city of immense wealth and magnificent architecture.”<sup>19</sup> At its greatest extent, the Byzantine Empire stretched from Italy to Turkey<sup>20</sup> and was extremely cosmopolitan. Due to this, historians claim that Byzantine chant was influenced by many different cultures and traditions.<sup>21</sup> In its early stages, the chant was primarily syllabic, but as the tradition grew and developed, it became increasingly melismatic resulting in the kalophonic style.<sup>22</sup> The kalophonic style is a florid style and, like bel canto, it means beautiful singing.<sup>23</sup> Today, Byzantine chant is characterized by a mixture of both syllabic and highly ornamental styles. For example, ornamental pieces are likely to be used at the

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<sup>18</sup> Conomos, “History of Byzantine Chant.”

<sup>19</sup> “Constantinople,” HISTORY, December 6, 2017, <https://www.history.com/topics/middle-east/constantinople>.

<sup>20</sup> “Byzantine Empire | History, Geography, Maps, & Facts | Britannica,” accessed April 10, 2022, <https://www.britannica.com/place/Byzantine-Empire>.

<sup>21</sup> Egon Wellesz, *A History of Byzantine Music and Hymnography*, Second Edition (Oxford: Oxford University Press, 1962), 31–32.

<sup>22</sup> Conomos, “History of Byzantine Chant.” 1.

<sup>23</sup> Maria Alexandru et al., “‘Traditional Innovation’ in Byzantine Chant: The Case of Kalophonia,” *Journal of the International Society for Orthodox Music* 3 (2018): 43.

following times during the service: during the communion of the congregation when the congregation approaches to receive the eucharist, after the dismissal while the laity are filing out, and during important and festal parts of the services. The other parts of the services mostly use heirmologic<sup>24</sup> hymns. Another reason for the diversity of music used today can be found in the great variety of composers who influenced the music and were "... saints and sinners, hymnographers, composers and scribes, teachers and disciples, patriarchs and painters, schoolmasters, and tailors."<sup>25</sup> One of the most influential of these was Bishop Chrysanthos, who made great reforms to the notation influencing the practice and teaching of Byzantine chant to this day.<sup>26</sup>

Although manuscripts are known to have existed prior to the 9<sup>th</sup> century,<sup>27</sup> Byzantine chant began as an oral tradition and was passed down from teacher to student for centuries. According to Dr. Grammenos Karanos, the teacher-disciple relationship "... has historically received the greatest emphasis by church musicians, as can be deduced from the thousands of references to teacher-disciple relationships in the manuscript tradition..."<sup>28</sup> At present, Byzantine chant is still an oral tradition since, unlike Western notation, modern manuscripts do not delineate what each note in the scale should sound like. In fact, understanding Byzantine notation is much less relevant to the sound of the hymns than mastering the oral tradition of the eight modes.

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<sup>24</sup> Heirmologic hymns are a style of hymn that contain one note per syllable.

<sup>25</sup> Dr. Grammenos Karanos, "Introduction: A Brief Overview of the Psaltic Art," v.

<sup>26</sup> Dimitri E. Conomos, "History of Byzantine Chant," 10.

<sup>27</sup> Wellesz, *A History of Byzantine Music and Hymnography*, 2.

<sup>28</sup> Grammenos Romanos, "Introduction: A Brief Overview of Byzantine chant," ix.

The record of Byzantine notation closely follows the developments of the chant itself. As composers became more creative and the chant began to mature, they needed a notation that suited their elaborations. Thus, the notation itself began to change. The evolving nature of the chant resulted in four main historical periods of chant which are subsequently described. In the early period, from around 950-1170, there were few neumes, but by the second period, 1177-1670, there were several signs that indicated time and motion, however, there still weren't enough to eradicate the necessity of memorization by the cantor. In the third period, from 1670-1814 more signs were added to help aid memorization, but memorization was still necessary. In the fourth and contemporary period, beginning in 1814, Bishop Chrysanthos of Madytos implemented notational reforms.<sup>29</sup>

In the time of Bishop Chrysanthos, the notation of Byzantine chant was very complex. As the chant became more soloistic and virtuosic, the notation became so intricate that only the very best cantors could understand it. Bishop Chrysanthos saw the need for a better method of teaching the music so that the tradition would not die out. This led him to develop a system of solmization based on the Western solfège system. The system, called *παραλλαγή*<sup>30</sup>, was meant to fit with the seven different notes of the scale based on the first six letters of the Greek alphabet, ΠΑ-ΒΟΥ-ΓΑ-ΔΙ-ΚΕ-ΖΩ-ΝΗ.<sup>31</sup> He also decreased the number of notational symbols to only 15, each with very clear functions. As a result of this "New Method"<sup>32</sup> of notation, the music became much easier to read and learn<sup>33</sup> and it is now the international standard.

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<sup>29</sup> Karanos, viii.

<sup>30</sup> Pronounced, parallage, the syllables are pronounced Nee, Pa, Voo, Ga, Thee, Keh, Zoh, Nee.

<sup>31</sup> Conomos, "History of Byzantine Chant," 11.

<sup>32</sup> Romanos, "Introduction: A Brief Overview of Byzantine chant," ix.

<sup>33</sup> Karanos, ix.

Although the New Method uses a solmization system and the neumes can be read note by note, Byzantine chant remains more of an oral tradition than its Western brother. This is due to three primary reasons: 1. The Byzantine solmization system does not change syllables depending on the fluctuating intervals of the scale. 2. The Byzantine scales are fluid and flexible and have certain pillar notes which other notes become attracted to and gravitate toward. This flexibility creates microtonal intervals.<sup>34</sup> 3. There is no musical instrument that can be used as a tonal guide to this system. To achieve the correct intonation, the student of Byzantine chant must listen to a chant instructor or recordings a great deal and practice replicating the very distinct motions of the Byzantine scale while a teacher checks for accuracy. Thankfully, there are now many recordings of the scales and modes available.

Due to the heavy emphasis on memory and the need for good examples to follow, as well as the need to be able to read Greek, Byzantine chant in America was experiencing a downward trend towards the end of the 20<sup>th</sup> Century. However, thanks to the efforts of various texts, schools, and online resources it is experiencing a resurgence. One resource that must be mentioned is the Divine Music Project of St. Anthony's Monastery in Arizona. This project, begun by Papa Ephraim, mentioned earlier, has set 6,000 pages of music in both Byzantine and Western notation to English and all are available online.<sup>35</sup> The music had to be slightly altered to fit the English text without wholly changing the tune. As Byzantine chant is written with

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<sup>34</sup> Karanos, v.

<sup>35</sup> "The Divine Music Project," St. Anthony's Greek Orthodox Monastery, accessed April 10, 2022, <https://stanthonysmonastery.org/pages/the-divine-music-project>.

musical formulae/θέσεις, rather than single notes, this was no small feat. A statement from the Divine music project has been provided for further understanding of this concept:

As a poetic act, composing music—*melopoiia*—carefully selects the signs that will notate and shape the musical ideas like successive musical arches, either small or large, that will raise the acoustical architectural structure of music. Each choice of the necessary signs and their appropriate combination is called a "formula" (θέσις). This is what Manuel Chrysaphes the Lampadarios taught and wisely explained in 1458: "A formula is called the combination of signs that constitutes the melody. Just as the combination of the twenty-four letters of the alphabet creates words when arranged in syllables, in the same way musical signs create the melody when artfully combined, and such a combination is then called a formula."<sup>36</sup>

Thankfully, Papa Ephraim has enough compositional knowledge to make the necessary alterations to the θέσεις while making sure the tune is still recognizable. As a result, the American population can more easily learn the chant in their native language. Below is an example of Papa Ephraim's work:

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<sup>36</sup> "Prologue to the Divine Music Project," St. Anthony's Greek Orthodox Monastery, accessed May 24, 2023, <https://stanthonyomonastery.org/pages/prologue>.

For Pascha, Thomas Sunday,  
Pentecost, and Nativity

80

Grave Mode

Intonation: #21

Ἦχος βαρύς Γα

Τὸς Θεὸς μέγας



hat God \_\_\_\_\_ is as great \_\_\_\_\_ as \_\_\_\_\_ our

\_ God? \_ \* Thou \_\_\_\_\_ art \_\_\_\_\_ God \_\_\_\_\_ Who \_\_\_\_\_ a -

- lone \_\_\_\_\_ work - - - est won - - - - ders.

Verses:

2. Thou hast made Thy power known among the people; with Thine arm hast Thou redeemed Thy people.
3. And I said: Now have I made a beginning; this change hath been wrought by the right hand of the Most High.
4. I remembered the works of the Lord; for I will remember Thy wonders from the beginning.

\* Finale:

Thou \_\_\_\_\_ art \_\_\_\_\_ God \_\_\_\_\_ Who a - lone \_\_\_\_\_

\_\_\_\_\_ work - - - est won - - - - ders.

Figure 1.1 An English setting of Byzantine chant composed by Papa Ephraim.



study and master Byzantine Music is among the highest callings in the Church's liturgical tradition.<sup>37</sup>

As such, the methods by which it is taught and sung should be more clearly understood.

It is with the hope of bolstering the longevity of this tradition that these subjects are pursued in this paper.

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<sup>37</sup> Metropolitan Gerasimos, "Letter from His Eminence, Metropolitan Gerasimos of San Francisco," in *Byzantine Chant: The Recieved Tradition- A Lesson Book* (Portland, OG: Cappella Romana Publishing, 2023), xiii.

## Chapter Two: An Investigation of Vocal Fatigue and Its Cause Among Cantors

As discussed earlier, one of the largest aims of this paper is to discover if there is a link between the vocal fatigue experienced by cantors and the pedagogy of Byzantine chant. Vocal fatigue can be described by patients' symptoms such as:

...feeling vocally tired after a prolonged period of talking accompanied by the sense that much effort is required to continue speaking. They (patients) may feel tightness in the throat and chest or experience varying degrees of dysphonia with the condition progressively becoming worse by the end of the day. It may be difficult for the patient to talk loudly, or they may find themselves talking in a monopitch.<sup>38</sup>

Vocologist Dr. Brian Gill also gives other signs of vocal fatigue in singers. These are: decreased flexibility/stability of the voice, voice cracking/excessive noise in the sound, a breathy sound, lack of clarity in the sound, and outward signs of strain.<sup>39</sup>

As was previously reported, the author has encountered many cantors who suffer from vocal fatigue. Though there may be other causes of vocal fatigue, one of the primary reasons for it is often hyper-functional, pressed, phonation. This type of phonation occurs when "a high subglottal pressure is accompanied by a low glottal flow."<sup>40</sup> High subglottal pressure is related to the vocal fold resistance level; the higher the resistance of the folds, the higher the subglottal pressure. Due to the fact that vocal fatigue is a sensation felt by the practitioner, it has been

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<sup>38</sup> Carol S. Eustace, Joseph C. Stemple, and Linda Lee, "Objective Measures of Voice Production in Patients Complaining of Laryngeal Fatigue," *Journal of Voice* 10, no. 2 (1996): 146–54, [https://doi.org/10.1016/S0892-1997\(96\)80041-5](https://doi.org/10.1016/S0892-1997(96)80041-5).

<sup>39</sup> Dr. Brian Gill, *Mindful Voice Training*, 2017.

<sup>40</sup> Polina Proutskova et al., "Breathy or Resonant - A Controlled and Curated Dataset for Phonation Mode Detection in Singing - Goldsmiths Research Online" (International Conference on Music Information Retrieval, Porto, Portugal: Goldsmiths Research Online, 2012), 590, <https://research.gold.ac.uk/id/eprint/9796/>.

hard to nail down the exact cause, but from the professional teaching experience of the author and various studies, a link between vocal fatigue and pressed phonation can be seen. For example, Greene explains, “Incorrect breathing, excessive tension in the larynx and an imbalance between glottic resistance and air pressure in individuals who use their voices considerably can cause a chronic laryngitis and weakness or *tiredness* of the muscles and laryngeal joints.”<sup>41</sup> Greene makes a connection between pressed phonation and vocal fatigue as pressed phonation is an “imbalance between glottic resistance and air pressure.”

Moreover, Koufman and Blalock conducted a study of what they coined “laryngeal-tension fatigue syndrome.” They concluded that professional voice users often experience vocal fatigue due to muscular tension.<sup>42</sup> With increased proprioception, many voice students will describe the feeling of pressed phonation as “strained” or “tense.” This can be confirmed by the fact that a strained voice will employ a high subglottal pressure, proving it to be pressed phonation. Pressed phonation is exhibited in a spectrum when the fundamental frequency is low compared to the second harmonic.<sup>43</sup> After investigating the link between pressed phonation and vocal fatigue, additional research is warranted to determine if pressed phonation is the only cause of fatigue among cantors.

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<sup>41</sup> Margaret C. L. Greene, *The Voice and Its Disorders*, 3rd ed. (New York: Pitman Publishing Company, 1972), 112.

<sup>42</sup> James A. Koufman and P. David Blalock, “Vocal Fatigue and Dysphonia in the Professional Voice User: Bogart-Bacall Syndrome,” *The Laryngoscope* 98, no. 5 (1988): 493–98, <https://doi.org/10.1288/00005537-198805000-00003>.

<sup>43</sup> Johan Sundberg, “Objective Characterization of Phonation Type Using Amplitude of Flow Glottogram Pulse and of Voice Source Fundamental,” *Journal of Voice* 36, no. 1 (January 1, 2022): 4–14, <https://doi.org/10.1016/j.jvoice.2020.03.018>. Harmonics are positive integer multiples of the fundamental frequency. On a spectrum the fundamental is the first peak that can be seen, and the second harmonic is the next one that can be seen.

Another possible cause of vocal fatigue among cantors is vocal inefficiency. Vocal efficiency occurs "...when only those muscles necessary for task completion are used, with appropriate timing and coordination across muscles. Inefficiency, involving the recruitment of more muscles than needed for task performance or "incorrect pattern" of muscle activation, will lead to greater energy demands for task performance."<sup>44</sup> If vocal inefficiency causes greater demands in energy, it can be deduced that an inefficient or untrained singer will experience fatigue more easily than an efficient or trained one. Since many Byzantine cantors fall into the category of untrained singers, they might be experiencing fatigue from these inefficiencies.

In conclusion, it is likely that pressed phonation and vocal inefficiency are two causes of the fatigue among Byzantine cantors as demonstrated by the case of Papa Ephraim, mentioned earlier. His fatigue was so severe that he found it necessary to seek the expertise of a Western voice teacher.

The relationship between pressed phonation and vocal inefficiency, along with perceived phonatory effort will be further examined to understand vocal fatigue in the Byzantine chant population. "Effort is a perceived exertion an individual feels from within. It is characterized by the cognitive, kinesthetic, and dynamic bodily response to physical activity."<sup>45</sup> Perceived phonatory effort (PPE) typically refers to the effort level the singer feels in the throat or body when producing sound. High perceived phonatory effort is often an indication that the

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<sup>44</sup> Chayadevie Nanjundeswaran, Jessie VanSwearingen, and Katherine Verdolini Abbott, "Metabolic Mechanisms of Vocal Fatigue," *Journal of Voice* 31, no. 3 (May 1, 2017): 378.e1-378.e11, <https://doi.org/10.1016/j.jvoice.2016.09.014>.

<sup>45</sup> Elizabeth Ford Baldner, Emerald Doll, and Miriam Ruth van Mersbergen, "A Review of Measures of Vocal Effort With a Preliminary Study on the Establishment of a Vocal Effort Measure," *Journal of Voice* 29, no. 5 (September 2015): 530-41, <https://doi.org/10.1016/j.jvoice.2014.08.017>.

singer is using pressed phonation or using their voice in an inefficient way. This is problematic because it leads to vocal fatigue as well as larger phonatory issues such as polyps, nodules, and hemorrhages with prolonged use.<sup>46</sup>

PPE can be observed by an experienced teacher or listener. To make this information viable to the Byzantine chant community, the different ways to hear vocal inefficiencies and pressed phonation will be discussed.

One way to potentially hear pressed phonation is through timbre. Timbre is defined as:

The character or quality of a musical or vocal sound (distinct from its pitch and intensity) depending upon the particular voice or instrument producing it, and distinguishing it from sounds proceeding from other sources; caused by the proportion in which the fundamental tone is combined with the harmonics or overtones (= German *Klangfarbe*).<sup>47</sup>

The portion of this definition that states that timbre is caused by the “proportion in which the fundamental tone is combined with harmonics and overtones” is incredibly relevant to the topic at hand. It has been found that the amplitude of the fundamental frequency can increase with greater peak to peak airflow.<sup>48</sup> The fundamental frequency is the lowest tone that is produced when the human voice phonates. Therefore, an increase in the amplitude of this frequency, F0, creates a warmer timbre as perceived by the listener. The opposite can be said of hyper functional, pressed, phonation.<sup>49</sup> In a more recent article by the same author it was

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<sup>46</sup> Jan Gauffin and Johan Sundberg, “Spectral Correlates of Glottal Voice Source Waveform Characteristics,” *Journal of Speech, Language, and Hearing Research* 32, no. 3 (September 1989): 556–65, <https://doi.org/10.1044/jshr.3203.556>.

<sup>47</sup> “Timbre, n.3,” in *OED Online* (Oxford University Press), accessed February 11, 2023, <https://www.oed.com/view/Entry/202089>.

<sup>48</sup> Gauffin and Sundberg, “Spectral Correlates of Glottal Voice Source Waveform Characteristics,” 561-65.

<sup>49</sup> Johan Sundberg, “Vocal Fold Vibration Patterns and Modes of Phonation,” *Folia Phoniatica et Logopaedica* 47, no. 4 (1995): 221, <https://doi.org/10.1159/000266353>.

confirmed that a fundamental frequency with a low amplitude is indicative of pressed phonation.<sup>50</sup> This type of phonation, which can be seen on a spectrum, can sound strident or brassy.

An auditory example of vocal inefficiency can be heard in the onsets and offsets of sound. If the beginning or end of a sound is not smooth, but rather hard sounding, this is an example of vocal inefficiency. When singing, the singer must produce a “sweet attack” which is the simultaneous occurrence of air flow and the closure of the glottis.<sup>51</sup> This type of onset is not obviously audible but produces clarity of sound. The hard attack, or glottal stop, however, is clearly audible. In a hard attack the vocal folds come together forcibly. A glottal stop is defined as “a form of plosive in which the closure is made by bringing the vocal folds together, as when holding one’s breath...”<sup>52</sup> Perpetual use of this type of attack can contribute to vocal fatigue.<sup>53</sup>

In order to exemplify vocal inefficiencies and pressed phonation, audio samples from popular culture as well as samples from Byzantine chant have been included along with spectrums to indicate areas of pressed phonation. The first example is from a recording by the popular singer Adele. Many people love Adele’s music, but it is also well known that she has had issues with vocal fold polyps.<sup>54</sup> Polyps are frequently caused by long term misuse of the

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<sup>50</sup> Sundberg, “Objective Characterization of Phonation Type Using Amplitude of Flow Glottogram Pulse and of Voice Source Fundamental.”

<sup>51</sup> Barbara M. Doscher, *The Functional Unity of the Singing Voice*, Second Edition (Lanham, Md., & London: The Scarecrow Press, Inc., 1994), 59-61.

<sup>52</sup> Arthur Hughes, Peter Trudgill, and Dominic Watt, *English Accents and Dialects: An Introduction to Social and Regional Varieties of English in the British Isles*, Fourth Edition (Great Britain: Hodder Education, 2005), 42.

<sup>53</sup> Doscher, *The Functional Unity of the Singing Voice*, 61.

<sup>54</sup> “Adele Opens up about Vocal Cord Surgery,” February 8, 2012, <https://www.cbsnews.com/news/adele-opens-up-about-vocal-cord-surgery/>.

voice.<sup>55</sup> The following recording is a clip from *Rolling in the Deep* from Adele's album 21: [Rolling in the Deep, clip](#).<sup>56</sup> This clip covers the chorus of the song; if one listens closely, they will hear a bit of a punch into the sound on "all" which is indicative of hard onset or glottal stop. In this example, Adele also dips into vocal fry, another type of vocal inefficiency, which is defined as, "... a rough or creaky quality in very low-pitched speech or utterance; a register of the voice or manner of speaking characterized by this."<sup>57</sup> Also, a particular brassy-ness or bite to Adele's sound on "all" can be heard. This timbre is often indicative of pressed phonation which is shown by a lowered fundamental frequency. In this case, it is proven to be pressed phonation by Figure 1.3.

Figure 1.3 shows the amplitude of the harmonics on the word "all" from the recording. The amplitude of the fundamental is -49 dB while the second harmonic is at -22 dB; the disparity between the two is therefore 27 dB. This is large enough to argue that pressed phonation occurred on the word "all." After pointing out some of the many instances of vocal inefficiencies and pressed phonation in this example, it is not surprising that Adele experienced vocal issues and found singing difficult; she even complained of voice fatigue by saying that her song *All I Ask* is difficult to sing live.<sup>58</sup>

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<sup>55</sup> "Vocal Cord Nodules and Polyps," American Speech-Language-Hearing Association (American Speech-Language-Hearing Association), accessed February 11, 2023, <https://www.asha.org/public/speech/disorders/vocal-cord-nodules-and-polyps/>.

<sup>56</sup> Adele, "Rolling In The Deep (Studio Acapella) (HD) + Download," July 22, 2011, <https://www.youtube.com/watch?v=n84uLQanjBg>.

<sup>57</sup> "Vocal Fry, n.," in *OED Online* (Oxford University Press), accessed February 15, 2023, <https://www.oed.com/view/Entry/224274>.

<sup>58</sup> "Adele Performs All I Ask and Admits to Finding It Difficult to Sing Due to Vocal Surgery | Daily Mail Online," accessed September 11, 2023, <https://www.dailymail.co.uk/tvshowbiz/article-3361332/Adele-performs-moving-rendition-ballad-Ask.html>.

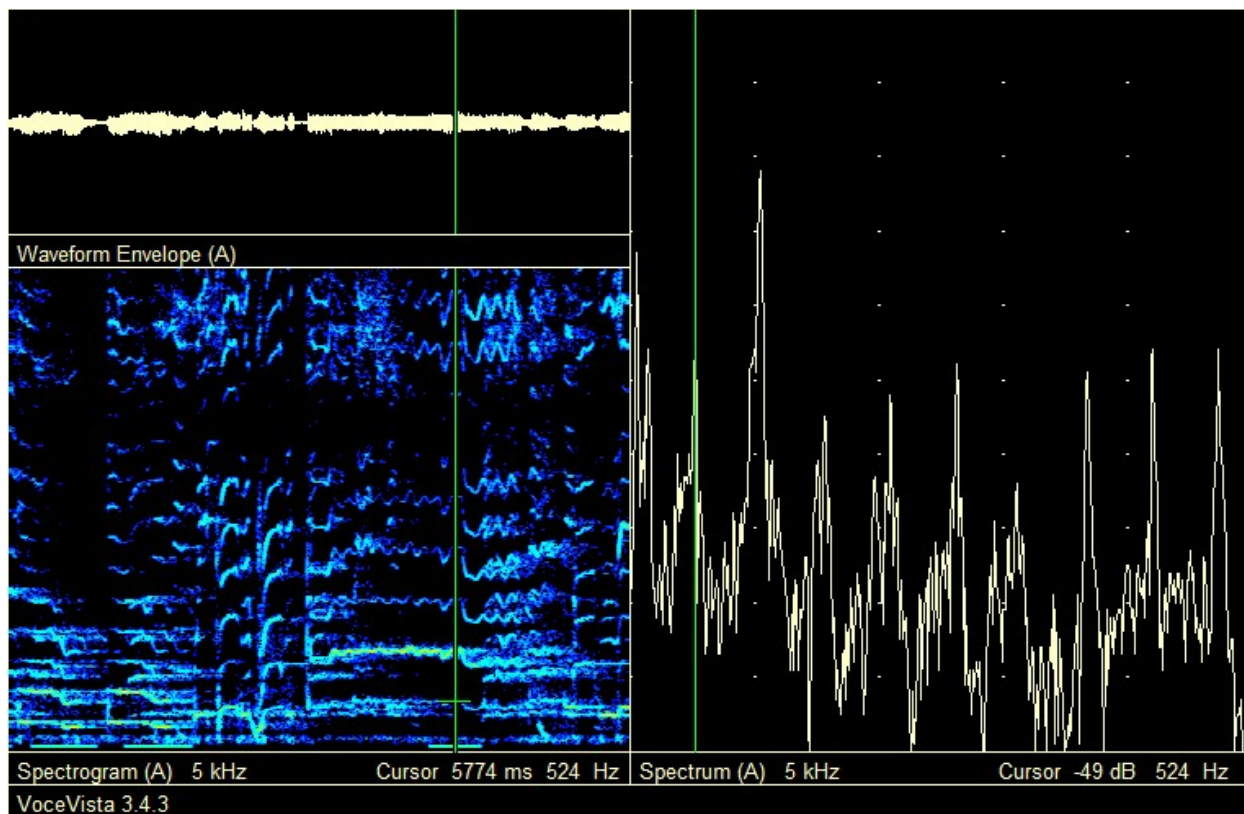


Figure 1.3 The amplitude of the harmonics on the word “all” from the recording.

To further exemplify vocal inefficiencies and pressed phonation, an example of a male voice, Steven Tyler of Aerosmith will be used. He has publicly appeared discussing his issues with vocal fold hemorrhaging, which is another pathology linked with pressed phonation.<sup>59</sup> In this clip of Steven Tyler singing *I Don't Wanna Miss a Thing*,<sup>60</sup> the reader can perceive what vocal inefficiency and pressed phonation sound like in the male voice.

In this clip of the chorus, various creaks in the sound can be heard, as well as an overall gravelly sound to the voice. As a reminder, vocal creaks generally come from vocal fry. Additionally,

<sup>59</sup> “Hemorrhage | Sean Parker Institute for the Voice,” accessed March 9, 2023, <https://voice.weill.cornell.edu/voice-disorders/hemorrhage>; Steven Tyler and Dr. Steven Zeitels, “The Today Show,” August 12, 2014, <https://www.youtube.com/watch?v=nFYnyAd2rro>.

<sup>60</sup> Aerosmith, “I Don't Wanna Miss A Thing (Solo Voz/Vocals Only),” May 8, 2019, <https://www.youtube.com/watch?v=doIv3UJZd58>.

when he stops singing, a glottal motion or hard offset can be heard. Lastly, pressed phonation can be heard in many areas of this song. In the figure below, the disparity between the fundamental and the second harmonic was 28dB.

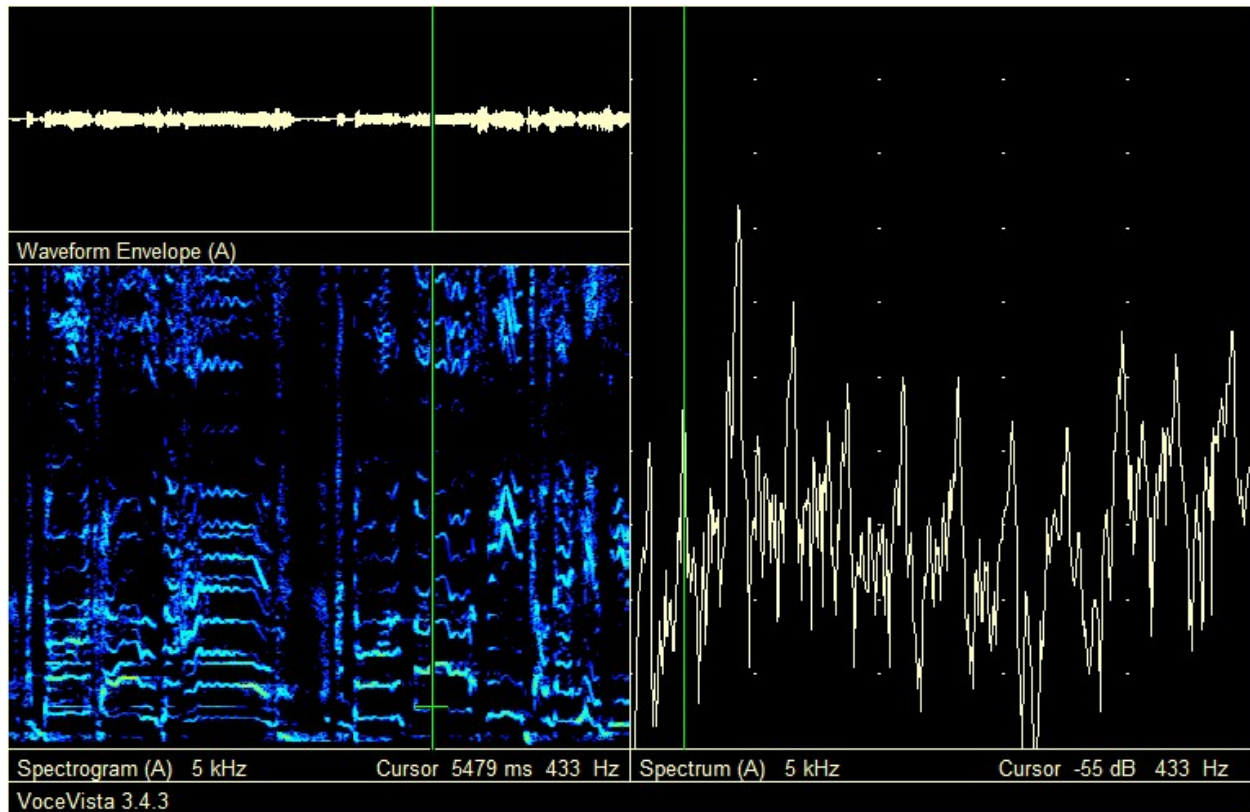


Figure 1.4 Steven Tyler's voice in a moment of pressed phonation.

Finally, in order to exemplify both pressed and flow phonation as well as vocal efficiency and inefficiency and their differences, the author has included examples of herself singing in both ways. [Pressed Phonation Example](#) This example approaches pressed phonation, but the author reached a level of discomfort that did not allow her to continue into pressed phonation. Regardless, a few similarities can be observed between this recording and Adele's: the sound might be described as having a quality of weight, as if it could not simply float up as high as possible, the sound is brassy, and the onset of the sound is not clean. Additionally, the

spectrum below shows the low amplitude of the fundamental frequency, 17 dB lower than the second harmonic, evidence of nearly pressed phonation in the recording.

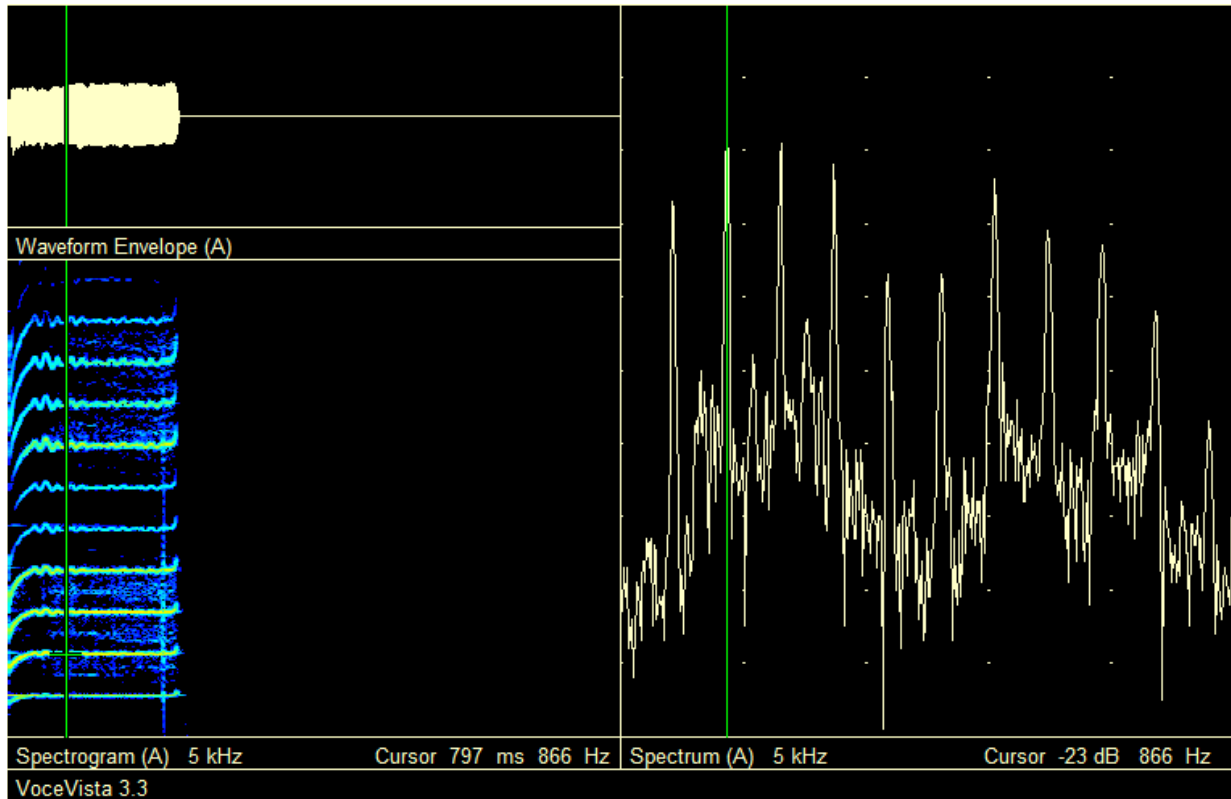


Figure 1.5 The author's example of pressed phonation.

The example of flow phonation has been sung on the same pitch, A 440, to create a clear comparison. Flow phonation is nearly the opposite of pressed phonation; it is the highest possible air flow with sufficient glottal closure.<sup>61</sup> [Flow Phonation Example](#) In this example, there is no quality of weight to the sound, and although the sound is somewhat bright it has a warm quality that cannot be described as brassiness, it also sounds as if the singer could go as

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<sup>61</sup> Gauffin and Sundberg, "Spectral Correlates of Glottal Voice Source Waveform Characteristics."

high or as low as possible in her range without difficulty. The sound heard at the beginning of the flow phonation recording is a tool called the “flow finger” that encourages flow phonation.<sup>62</sup>

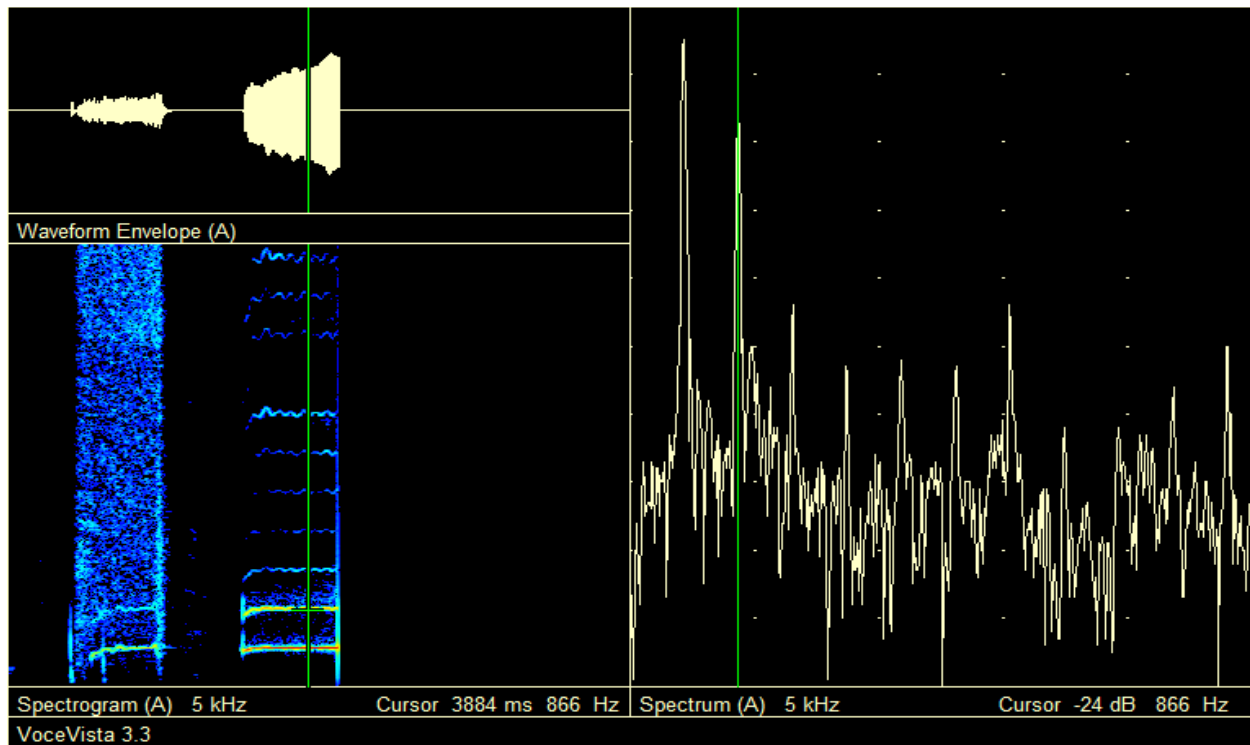


Figure 1.6 The author’s example of flow phonation.

The above spectrum shows flow phonation from the recording because the fundamental is 18 dB higher in amplitude than the second harmonic and high air flow has been proven to raise the amplitude of the fundamental frequency.<sup>63</sup>

Now that the auditory properties of perceived phonatory effort and vocal inefficiency have been discussed, the same observations can be made from recordings of Byzantine cantors of the past and from the contemporary Byzantine cantors that were recorded during this study.

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<sup>62</sup> Dr. Brian P. Gill, *Practical Voice Training*, 2018.

<sup>63</sup> Sundberg, “Objective Characterization of Phonation Type Using Amplitude of Flow Glottogram Pulse and of Voice Source Fundamental,” 11-12.



Figure 1.7. One of the oldest recordings of chant ever made. It is of the past Protopsaltis at the Patriarchate of Constantinople, Iakovos Nafpliotis. <sup>64</sup>

In this first recording, one can hear a brassiness to the sound as well as certain vocal breaks that occur during the pulsing motions in the voice. Additionally, at the very beginning of the recording, the slide up on the [ε] vowel sounds “heavy” and weighted as if it is difficult to ascend to the higher notes.

Also, of note, at around 2:15 during the recording, he ascends to a high note on an [o] vowel. Figure 1.6 shows this moment of pressed phonation with a disparity of 36 dB between the second harmonic and the fundamental.

It must be noted that the quality of the recording can affect the overall sound that one hears, however, the vocal breaks and heaviness of sound are not likely to have been influenced by the recording equipment.

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<sup>64</sup> Iakovos Nafpliotis, "Lenten Sunday Vespers (Byzantine chant, 1914-1926)," November 4, 2009, <https://www.youtube.com/watch?v=HMpvT3ojK4I>.

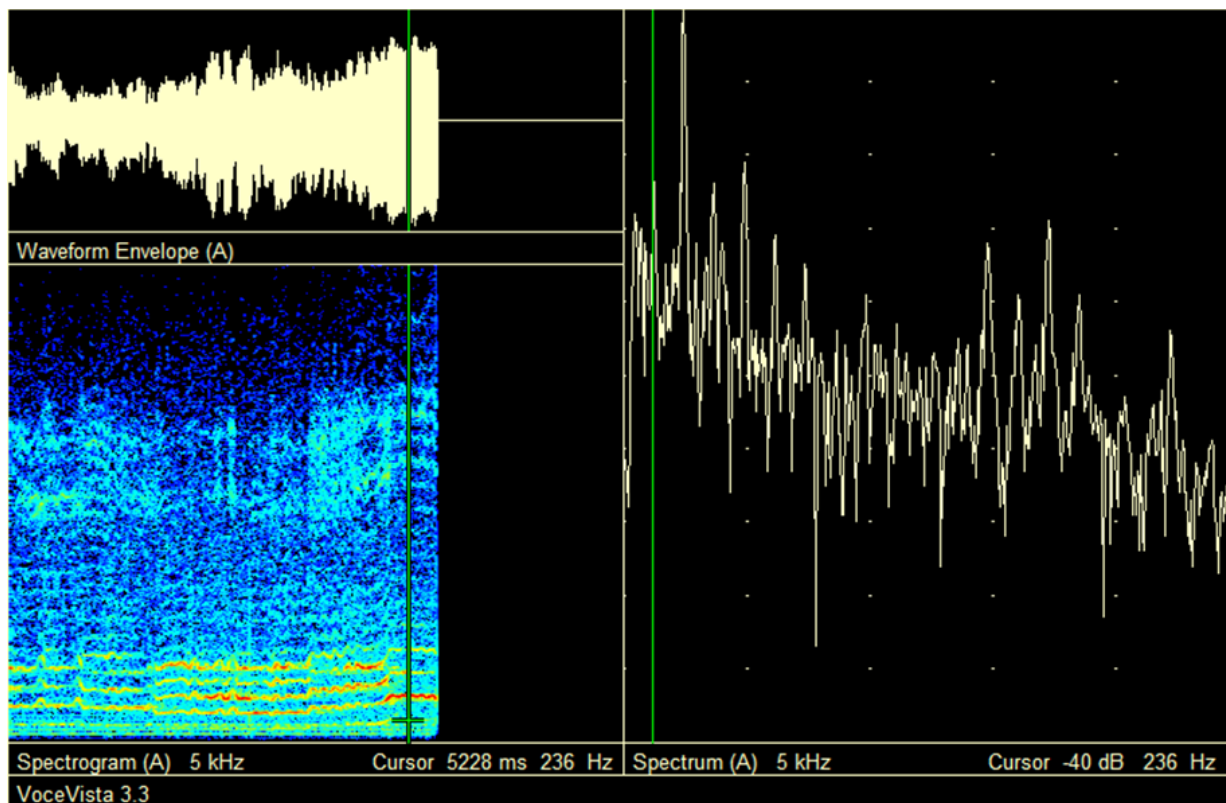


Figure 1.8 An example of pressed phonation in the recording of Iakovos Nafpliotis.

The next recordings that will be analyzed were recorded by the author. Two very important cantors, male and female respectively kindly agreed to be recorded and interviewed. First, examine a hymn sung by the male cantor: [Εξηγέρθη ὁ Κύριος, The Lord Awoke](#)<sup>65</sup> There are many things to glean from this recording. Firstly, the style, or yphos, used in this recording is Constantinopolitan. An important part of this Constantinopolitan style of singing is the pulsing that can be heard in the recording. The reader will notice a similarity between Nafpliotis and this singer. This alone shows this cantor's amazing ability to replicate sound from recordings.

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<sup>65</sup> Nicholas Roumas, *The Lord Awoke*, WAV, 2021.

When listening for potential signs of pressed phonation and vocal inefficiency throughout the recording, there are some dips into vocal fry and some creaks, as well as an occasional “brassy sound.” At around six minutes into the recording, the piece ascends to a higher register. At this point, a bit of muffling can be heard in the voice, the sound is coming out, but it sounds slightly trapped. This indicates that the back of the tongue is overly depressed, another type of vocal inefficiency. Lastly, at around 3:00, there is a moment where he ascends to a high note on an [a] vowel and the sound quality changes to a slightly strained quality. Looking at this moment in figure 1.7, the pressed phonation or strain can be seen in the disparity of 23 dB between the amplitude of the fundamental frequency and the second harmonic.

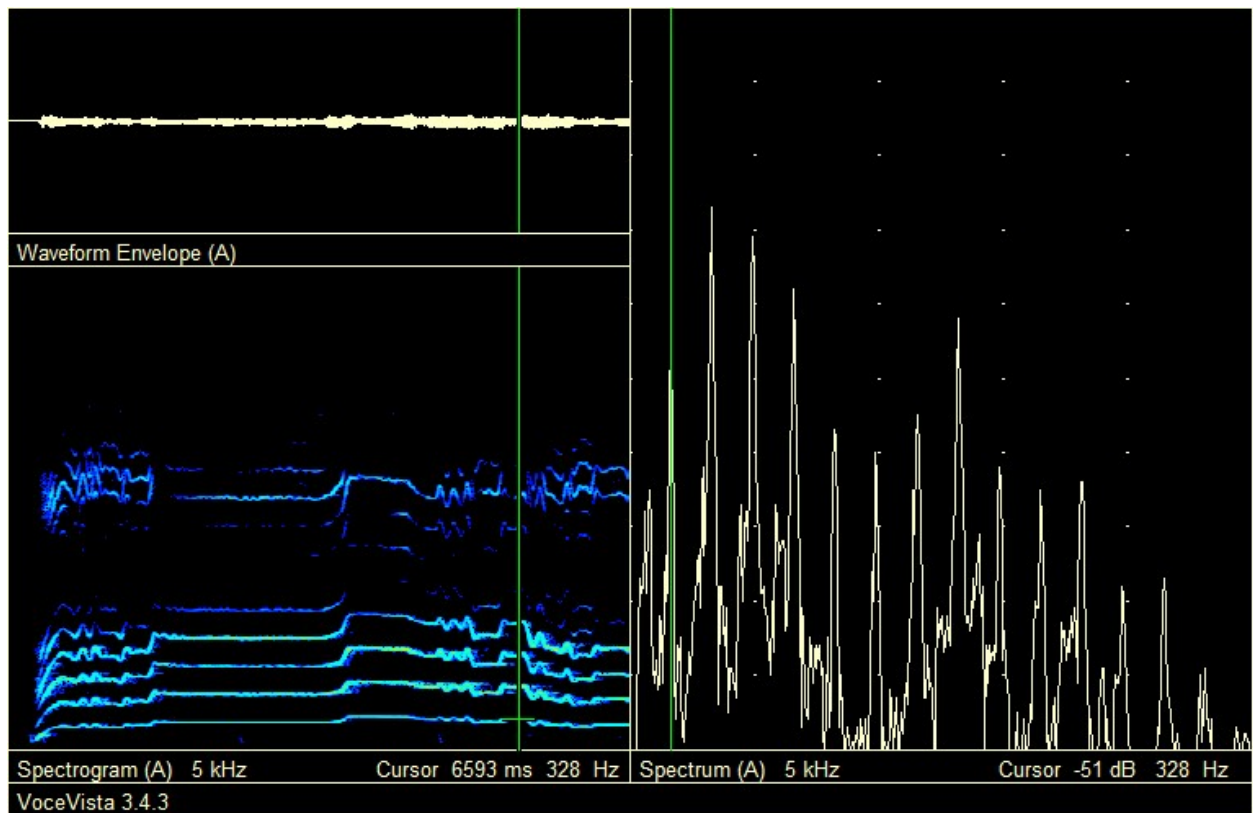


Figure 1.9 An example of the male cantor’s pressed phonation.

It is also highly important to note that this singer complained of vocal fatigue. The culmination of pressed phonation and other vocal inefficiencies are likely what led to this.

An aspect that cannot be understated is that pressed phonation does not always constantly occur in the voice of someone who presses, nor is there always the same amount of pressure. To expound upon these ideas, pressed phonation exists on a gradient, it occurs at different intensities and the subglottic pressure can measure anywhere between high pressure and low pressure. Also, there can be different times in the same song where the singer is obviously pressing and at other points is not. For example, in the above Byzantine chant examples, only certain moments were used to exemplify pressed phonation because it didn't occur throughout the entirety of the recordings. However, even if there is a slight bit of pressing occurring, the *frequency* of it has a great effect on vocal fatigue. For example, if a singer is pressing only a bit and singing only a little bit at a time, they probably won't experience vocal fatigue. However, in the case of the male voice cantor, his frequency of singing is extremely high, so even if he is only pressing a small amount, he will feel fatigued.

The last recording to examine is that of the female chanter. [Doxasticon of St. Nicholas](#) <sup>66</sup> In this piece some pulses can be heard in the voice, but the pulsing doesn't cause vocal creaks. Also, at times when the voice is ascending and it sounds like weight is being gathered and the voice cannot move any higher, the singer eventually switches registers to alleviate some of this difficulty. The inefficiencies that can be heard are hard attacks and/or creaks into the sound. There is no evidence of pressed phonation, and most importantly she did not complain of vocal

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<sup>66</sup> Sarah Roumas, *Doxasticon of St. Nicholas*, WAV, 2023.

fatigue. However, this singer was also trained in Western music and took voice lessons prior to learning chant, this may explain some of her vocal efficiency compared to other cantors.

The statements of vocal fatigue given by Papa Ephraim, the male cantor, the author's colleagues, the recordings, spectrums, and the signs of vocal inefficiencies should provide enough evidence to conclude that Byzantine chant can cause vocal fatigue among cantors. After this discussion, Papa Ephraim's statements about the Western vocal teacher who eradicated his vocal fatigue may cause questions to arise about the differences between the pedagogies of Byzantine chant and Western singing. Chant pedagogy could not eradicate his vocal fatigue, but Western pedagogy could. The next section will begin an investigation into the pedagogy of Byzantine chant in search of answers to these questions.

## Chapter Three: The Pedagogy of Byzantine Chant: An Interview with Fr. Romanos Karanos

Opening the discussion of Byzantine pedagogy, it is important to mention that in addition to a chant teacher, many cantors learn chant style from recordings. Again, because there is no musical instrument that is tuned to the Byzantine scales, cantors must resort to repeating what they hear. Since recording equipment can alter sound, it can cause chant students to mimic what wasn't there in the first place. Additionally, without knowing *how* the sounds in the recording are being made, students will resort to their automatic physical response in order to replicate the sound. This is very akin to anyone who hasn't undergone vocal training singing along to their favorite recordings. There is no telling what kind of vocal technique they will end up using and, as a result, many people end up experiencing vocal fatigue.

To truly understand the trajectory of a student of Byzantine chant, as well as what occurs in a chant lesson, expert cantors and teachers of Byzantine chant have been interviewed. The following chapters are dedicated to these interviews with some anecdotal information from the author.

Historically, Byzantine chant was taught from master to apprentice via oral tradition. A master would teach a protégé at the cantor's stand and when he retired the protégé would take his place. In some places, this tradition continues to this day; in others, the development of schools and classes for learning Byzantine chant have created an atmosphere where one head cantor is teaching many students at once. Similarly, classical singing was also taught from master to protégé until the development of conservatories. The difference between classical

singing and Byzantine chant, however, can be seen in the pedagogy itself. In classical music pedagogy there has long been a tradition of technical pedagogy. By the 18<sup>th</sup> century treatises on technique and pedagogy had already been written. One such example is Pier Francesco Tosi's *Observations on the Florid Song*, published in 1723. Classical music teachers were so devoted to learning more about the voice and technique that in 1854 Manuel Garcia II invented the first laryngoscope.<sup>67</sup>The laryngoscope used two mirrors to view the vocal folds with the sun as a light source. One mirror reflected the light into the throat and the other reflected an image of the vocal folds.<sup>68,69</sup> In Byzantine chant however, although it is a much older tradition, not much is written about the technique or method of vocal production required to produce the desired sound. One of the only samples of a written document on technique is from a recent book written by John Michael Boyer and published in 2023. This book is meant to be a lesson book of Byzantine chant and it is an excellent one, however, one of the limitations of this work is that it only includes one page about vocal technique.<sup>70</sup>

The following interviews will investigate the pedagogy more deeply to specifically discover what is missing in the education of cantors to cause so many of them to experience vocal fatigue. Each expert interviewee was asked about their individual paths to becoming

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<sup>67</sup> Judith A. Coe, "History of Vocal Pedagogy: Perspectives, Timeline and Resources, Acoustics, Anatomy, Physiology, and Function," August 31, 2006, [http://carbon.cudenver.edu/~jcoe/vocalped\\_timeline.pdf](http://carbon.cudenver.edu/~jcoe/vocalped_timeline.pdf).

<sup>68</sup> "History of the Laryngoscope," *ENTtoday* (blog), accessed September 12, 2023, <https://www.enttoday.org/article/history-of-the-laryngoscope/>.

<sup>69</sup> "Manuel Patricio Rodríguez García | Vocal Pedagogy," accessed September 12, 2023, <https://vocalpedagogy.com/vocal-pedagogue/manuel-patricio-rodriguez-garcia/>.

<sup>70</sup> John Michael Boyer, *Byzantine Chant: The Recieved Tradition-A Lesson Book* (Portland, OG: Cappella Romana Publishing, 2023).

cantors as well as information about their own advice to other cantors and what they think of vocal technique.

*Interview 1, Fr. Romanos Karanos*

The first expert who was interviewed is experienced in teaching many students in chant classes and in private study. Fr. Romanos Karanos is the director of the Byzantine Music program at Hellenic College Holy Cross, the only Greek Orthodox Seminary in the United States. He taught classes on what he dubs the Psaltic Art and is also an esteemed musicologist.

Fr. Romanos's journey to becoming a professional cantor began during his study of Byzantine chant in early life. During his time in elementary school, he learned to chant in the village church in Greece, but he claims, "this was not extremely serious study."<sup>71</sup> When he was 16, he learned Byzantine music theory and notation and began to learn to sing from cassette tapes of famous cantors. He states, "This was when I became more serious about the study of Byzantine chant."<sup>72</sup> His use of tapes exemplifies the use of recordings as an aid to learning the style and sounds of Byzantine chant which continues today.

It was not until later in life, in his adulthood, that he formally studied with Photios Ketsesis, who was his predecessor as the director of the Byzantine music program at Hellenic College, Holy Cross. While he was a banker, Photios was a client of the bank. He often saw Fr. Romanos there and eventually asked him why he wasn't formally studying chant. Fr. Romanos explained, "I was working as a banker while listening to chant and studying it on my own.

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<sup>71</sup> Karanos, Romanos. 2021. Interview by author. Zoom. June 8, 2021.

<sup>72</sup> Karanos, interview.

Then one day Photios said, ‘Why don’t you study with me?’<sup>73</sup> Then he studied with him for five years. Fr. Romanos’s interest in Byzantine music is not limited to performing; he has also received a doctorate from the University of Athens with a dissertation on 18<sup>th</sup> century collections of byzantine music.

**Author:** Did you learn any vocal techniques while being taught Byzantine chant?

**Fr. Romanos:** I wasn’t taught technique and traditionally vocal technique is not taught. It is important to remember that chanting is first and foremost a form of prayer. But I did take Western voice lessons at Harvard where I learned to breathe diaphragmatically.<sup>74</sup>

This description of breath is a bit antiquated because it is not possible to breathe without the diaphragm, but the author assumed that he meant he learned to breathe more deeply. It is possible that not truly understanding the breathing mechanism might lead to vocal fatigue, however, a very important part of what he said is that prayer is the primary purpose of chanting. Therefore, most cantors should be more focused upon praying than singing, so that even if they become fatigued, they will continue to chant in service of God. This is a beautiful and meaningful sacrifice. The author does not wish to diminish this sacrifice but hopes to aid the process of chanting in becoming more sustainable so that the people who make this sacrifice can be granted relief.

Fr. Romanos states, “Chant can be learned primarily by listening to recordings of many different cantors.”<sup>75</sup> Recordings are not negative overall, and students may glean much

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<sup>73</sup> Karanos, interview.

<sup>74</sup> Karanos, interview.

<sup>75</sup> Karanos, interview.

knowledge from them, but the act of listening to them and copying them does not appear to be enough to cause students to consistently produce chant with healthy and informed execution.

**Author:** Did you learn about the sensations of resonance when learning to chant?

**Fr. Romanos:** I didn't necessarily incorporate those techniques, but by imitating other cantors, I eventually developed my own style. In my early days, I even went so far as to imitate the lisp of one cantor I listened to.

**Author:** Were you even concerned with being loud enough?

**Fr. Romanos:** No, in the late 90's mics were introduced into the churches.

From these statements it may seem that, overall, Fr. Romanos does not think very much about vocal technique when chanting. However, in the following observations he points to things that relate to technique.

**Author:** What do you think is the potential cause of vocal fatigue among cantors?

**Fr. Romanos:** I think the issue is pitching things too high. A psalti needs to know the range of the hymn, but he often doesn't, and he needs to start on a pitch that will be optimal for his range and the range of the other people he is chanting with.

Since Byzantine chant is unaccompanied, it is easy to begin on any pitch. Fr. Romanos's assessment of pitching shows that he intuitively understands some things about the voice. Pressing can occur when a singer tries to access the higher part of their range; without training, they might strain to reach a high note, thus resulting in vocal fatigue. Additionally, the pitch on which the hymn begins affects the overall tessitura<sup>76</sup> of that hymn. If a cantor has a different

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<sup>76</sup> Tessitura is the average area of notes where a song sits or lives. So, a high tessitura would sit high in the range.

range from the one giving the pitch, they may have to remain in an area of their range that is either too high or too low for a long period of time which can also cause fatigue.

Fr. Romanos also mentioned “When you’re listening to psalti and watching them chant, it’s important to pay attention to the shape of their mouth.”<sup>77</sup> This is a relevant observation because changes in mouth shape affect the cavity resonance which can create different timbres as a result.<sup>78</sup> It is also proven that an elongated and rounded mouth can reduce pressure at the vocal fold level by a passive widening of the airways.<sup>79</sup> Many singers seem to be vaguely aware that mouth shape affects vocal color, but not that it can affect their subglottal pressure. This is something that a teacher can impart to their students which in turn creates a more effective and efficient pedagogical method.

When discussing vocal color and style it is important to mention that slightly different aesthetic and stylistic approaches appear in the different locations where Byzantine chant is performed. For example, Fr. Romanos mentioned that the Athonite monks<sup>80</sup>, “... claimed that the voice is the ‘vehicle to the divine’ and they would emphasize the importance of the text.”<sup>81</sup> The Patriarchal tradition, however, had more “stately and majestic” settings.

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<sup>77</sup> Karanos, interview.

<sup>78</sup> “Cavity Resonance,” accessed January 30, 2023, <http://hyperphysics.phy-astr.gsu.edu/hbase/Waves/cavity.html>.

<sup>79</sup> Ingo R. Titze et al., “Vocalization with Semi-Occluded Airways Is Favorable for Optimizing Sound Production,” *PLOS Computational Biology* 17, no. 3 (March 29, 2021): e1008744, <https://doi.org/10.1371/journal.pcbi.1008744.6>.

<sup>80</sup> Mt. Athos is an ancient home of Orthodox monasticism. It contains 20 different male monasteries of the Eastern Orthodox tradition. It is located on an eastern peninsula in Greece, and it has a fairly independent system of governance from the mainland.

<sup>81</sup> Karanos, interview.

These differing styles can be heard in the following recordings, the first is of Panagiotis Neochoritis the current Protopsaltis at the Patriarchate of Constantinople:<sup>82</sup>



Figure 1.10 Panagiotis Neochoritis chanting.

The second is a recording of much of the chanting done on Mount Athos<sup>83</sup>:



Figure 1.11 Chanting on Mount Athos.

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<sup>82</sup> Neochoritis, "Την Γαρ Σην Μήτηραν-Παναγιώτης Νεοχωρίτης//Tin Gar Sin Mitran," April 21, 2020, <https://www.youtube.com/watch?v=N2BovmJn7Co>.

<sup>83</sup> Holy Mount Athos, "Orthodox Chanting. Monks from Mount Athos - Greece," March 15, 2022, <https://www.youtube.com/watch?v=2GKQKPVg6pQ>.

From these two examples, it can already be seen that there is an aesthetic or stylistic difference between the chant from different regions. For example, in the first recording the different melismatic passages are produced with a pulsed tone instead of smooth tone as in the Athonite recording. Also, the Athonite recording has stronger syllabic stress which goes along with Fr Romanos's statement about their emphasis of text. These stylistic differences are called yphos<sup>84</sup> by the Byzantine chant community. One could say that Byzantine chant has an overall yphos and that within Byzantine chant there occur different yphoses.<sup>85</sup> For our purposes, we can think of yphos as the desired timbre and performance styles that are unique to Byzantine chant. These styles may impact fatigue differently, for example, pulsing can cause the cantor to use glottal attacks and to become fatigued as a result.

Fr. Romanos also developed his own chant style over time, and he recommends that everyone find their own style eventually. Therefore, Byzantine chant in America has some

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<sup>84</sup> Alexander Konrad Khalil, "Echoes of Constantinople: Oral and Written Tradition of the Psaltes of the Ecumenical Patriarchate of Constantinople" (Ph.D., United States -- California, University of California, San Diego, 2009), 4,

<https://www.proquest.com/pqdtglobal/docview/250832157/abstract/DEF26D66A2224DF1PQ/1>.

<sup>85</sup> An in-depth discussion of yphos can be found in the dissertation, "Echoes of Constantinople: Oral and Written Tradition of the Psaltes of the Ecumenical Patriarchate of Constantinople," by Alexander Khalil.

uniformity by sounding Byzantine overall, but it may also have slight differences depending on how each student learned and from whom.

This discussion of yphos (style) displays that cantors like Father Romanos are concerned with their overall sound and whether it matches Byzantine style. As a result, cantors appear to have some, albeit superficial, thoughts about the voice. Fr. Romanos's interview provided new ideas about the approach to Byzantine chant that had not been foreseen by this author. These include the information on pitching and mouth shape which display good intuition about the voice and ways to use it efficiently. Additionally, some conclusions from the wisdom of Fr. Romanos may be drawn; Byzantine chant is primarily taught through listening and replication, prayer is an important component of Byzantine chant, a chant teacher does not necessarily teach vocal technique, and a large emphasis is placed on the importance of the words. To find a way to balance vocal health and prayer life, the author continued to investigate vocal fatigue in the following interviews.

## Chapter Four: Interview with Dr. Nicholas Roumas

Currently, Dr. Nicholas Roumas teaches at the Archdiocesan School of Byzantine Music.

This consists of teaching individual chant lessons to a variety of students online. He has also found that many people in the area where he now lives desire to learn chant. He graduated with a master's in theological study from Holy Cross Hellenic College where he also studied Byzantine chant.

**Author:** What do you think of the term Byzantine chant?

**Nick:** The traditional psaltes I've met, meaning people who do things the old way, their primary impetus behind their chant, their primary motivation is what they have heard and what they're doing in church, not a study of it. But those people don't have a name for this, but if you say psaltiki or just church music they know what you're talking about.<sup>86</sup>

**Author:** When did you begin to study this type of music?

**Nick:** I don't like to divorce different types of cantoring from each other; I think they are all really one thing in many expressions. I first discovered more about this expression of chant when I was 13, on a bishop's visit. When I got into college and had the cathedral down the street, I sat down and learned the theory. I had to do this several times, because I was learning that you really do have to glue your butt down and do this. One summer, I ended up spending the whole summer learning the raw, raw basics. These were the notation and some basics of execution. Then, once I had done that, I started studying the Anastasimatarion.<sup>87</sup> Following someone's advice, I got the Katsoulis<sup>88</sup> tapes, which I highly recommend. That Holy Week, I went up to the psaltirion (cantors stand). I had a friend who I got to invite me so that I had permission to go up. Then I just got worked into the system there (at the cathedral down the street) and stood behind the old guys and learned. That was where I learned how to *really* do it, plus studying a lot of recordings. But the important thing I say people should take away from that is, it was important to be really discerning about what I was listening to. When you are a beginner, and you are faced with learning some

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<sup>86</sup> Nicholas Roumas, interview by author, Zoom, December 6, 2022.

<sup>87</sup> This is a book containing the parts of Vespers and Matins that come from the Ochtoechos, which has the texts from hymns for each of the eight modes which rotate weekly.

<sup>88</sup> These recordings can be found here: <https://analogion.com/site/html/Katsoulis.html>.

complex kind of music, you say ‘Well I’ll be happy if I can just do it well enough.’ Maybe you need that to get you past step one, but you don’t want to stay with that, and you don’t want to just learn off the first thing you find. So, I read up a lot. There were some great websites at that time which are now defunct or full of broken links. I learned a lot from people who were very knowledgeable, and it still serves me very well. People like Nick Yanokakis, he was in a group of cantors in Montreal and a lot of people came out of that... They really disseminated their knowledge, and I learned a lot from that. What I really learned was how to pay attention to what you’re listening for and what to listen to. I did that in church, and I did that with recordings. So, I was very discerning about what I listened to. And I still have a massive, curated collection of things that passed muster.

To deeply understand any subject and recall it years later, repetition is required.<sup>89</sup> Due to the complexity of Byzantine chant, Nick spent an entire summer learning only the introductory stage of this art form, which is common among cantors. A student of Western music may take the same amount of time to learn to read music, but at this time they are also learning the basics of execution. Nick describes that he learned the *notation* and only *some* basics of execution. This is due to the fact that Byzantine notation alone is extremely difficult to learn.

**Author:** You said you were discerning about what you listened to, what did you listen for specifically?

**Nick:** We could talk about it as musical execution, but we don’t want to divorce that from the practice of what’s going on, which is chanting texts including reading texts. Psaltiki, includes everything the psaltis does, that includes reading and reading is a skill. Some people can’t read correctly in church. Anybody can learn to, but you need a little instruction in how to read that in this setting, how to make it clear and give it an appropriate sound. Then, the musical part is just an extension of that same thing. We don’t chant scores, we chant texts. All the best psaltes don’t use scores except when they have to. They prefer to have the service book out or just to do it from memory... The idea is that they are prayers, and you are reading, speaking the prayers and in some cases putting melody with them. That melody has to meld with the text and bring out the text and be a

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<sup>89</sup> Lexia Zhan et al., “Effects of Repetition Learning on Associative Recognition Over Time: Role of the Hippocampus and Prefrontal Cortex,” *Frontiers in Human Neuroscience* 12 (July 11, 2018): 277, <https://doi.org/10.3389/fnhum.2018.00277>.

partner united with text. This is even true when you have long melismatic phrases, they are still tied to the text. Then there are little details you can listen for, and you don't want to be rigid or legalistic about it, but you can listen to things people have traditionally done, and I have found among traditional psaltes they're very consistent with these things... the clarity, the ethos of what they're doing.

Nick's statement of chanting texts, not scores, is even more emphatic than the one given by Fr. Romanos, but it is essentially the same idea. At this point, take note of the fact that, without directly stating it, Nick is emphasizing the oral tradition of Byzantine chant.

**Author:** What are these consistent details that you hear among a variety of cantors?

**Nick:** The most fundamental thing is chronos, which means time or duration, but in chanting it means more than that, it has a broad meaning encompassing notions like pulse, keeping a beat and manipulation of time.

Chronos was called "engagement of tempo" by George Michalakis.<sup>90</sup>

**Nick:** When you chant there is an ebb and flow and it starts on the level of every note, one by one. If we're learning we're going to be patting on the knee and it's not robotic, it's a curved motion and it's fluid, it's a cycle. In church, we've internalized that movement so that we only do small movements. You want a nice vivid pulse, vivid chronos in your chant because that is the appropriate ethos. You want them to be *alive*, resurrection, strong, triumph. To do that, you need to have a nice vivid burst when your hand strikes. In order to do that, you've got to articulate early. This is the most common thing that people don't get right, but if you show them how to do it, it's very simple. You need to form your consonants in your mouth very early so that when your hand strikes, the vowel can burst out and hit peak volume right on the beat. You've got to be very strict with this kind of music; you can't be mushy with your attacks, they can't be about on the beat, they've got to be right on the beat and if it's off the beat it has to be very deliberate and right where you meant it to be. Then right after that attack, you're going to let off on the volume and pull back from that note early, you have to be totally silent to leave ample time to form the next consonant before the next strike. That's engagement and chronos and that is one of the basic things that creates pulse and clarity. When you separate out your consonants and your vowels, you help to keep your consonants clear because you can't sing a

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<sup>90</sup> Michalakis, George, "Byzantine Rhythm," September 12, 2017, <https://www.scribd.com/document/358719185/Mihalakis-docx#>.

consonant. Your consonants will become unclear if you are trying to produce your consonants when you are bursting out with the vowel.

**Author:** Will you speak more about your study of Byzantine chant?

**Nick:** When I got to Holy Cross, I learned some new material, some new repertoire. I learned a little bit of new theory, but I knew all the important stuff already. That was mostly from listening and doing a lot of study. Holy Cross was a very different environment because, where I was before, it was the concentration of a monastery, just getting to study and listen all the time. But, when you're in school, 95% of the people chanting around you, and they're all made to chant, they're all forced to do it. They are just beginning and don't know what they're doing yet. What I learned there was not so much how to chant better, but how to make a group cohere and do the typicon.<sup>91</sup> Really most of my improvement in skill came after that.

**Author:** Can you give details about your one-on-one lessons in chant?

**Nick:** I studied privately in college and then I had another guy after that when I was at Holy Cross. When I wasn't in the chapel on Sundays I went up to a parish, and I went there as much as I could because the guy there had learned the theory, but he was old and had long since forgotten how to read any of it. He had the best sound that I had ever heard personally. There're guys out there buried like this, and you have to find them and listen to them and capture them. You should not write them off because they have holes in their theoretical knowledge.

At this point, Nick's practice of curated listening continued throughout his study of Byzantine chant. Like Fr. Romanos, Nick was also curious about the specific sounds of Byzantine chant, but he wasn't concerned with sensation and technique. However, his interest in the voice increased and Nick sought out a Western voice teacher.

**Author:** Why did you end up seeking out a Western voice teacher?

**Nick:** My purpose in seeking a teacher was to deal with range and to some extent stamina. It has helped with that, but it has also helped with projecting and consistency. That's all been a big deal and I recommend to my students now to just go to a voice teacher. It was very helpful...

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<sup>91</sup> In this case, Nick means the typicon which dictates how to run the services of the church.

By stamina, Nick is referring to his previous experience with vocal fatigue.

**Author:** Do you think about resonance when chanting?

**Nick:** Previously, (before lessons) I was trying to match sound, but that has changed a lot. I have done a much better job now integrating feel with sound and it's helping my pitch and range a lot. Now it is all just throwing a bunch of frequencies in your head and that's where you do all the tuning.

**Author:** What was your experience with breathing before and after taking voice lessons?

**Nick:** Because I am using my back and ribs more, I am finding breathing is much easier, I have to think about it less. Before, I thought about breathing all the time. I was doing all belly, but I wasn't getting my ribs into it. I think some of that was learned from having to deal with microphones too much. I think I breathed better when I was starting off, before microphones.

Nick explained that there is a lack of information on physical execution of the technique in the pedagogy of Byzantine chant.

**Author:** Can you explain a bit about the hierarchy of cantors?

**Nick:** (In Constantinople) You've got the protopsaltis: leader of the right choir. The protopsaltis is in charge, even the Ecumenical Patriarch cannot tell the protopsaltis what to sing. He can set the typicon, he can't tell him, "This is what you are going to sing." Then you've got the lambadarios torch bearer: leader of the left choir. This set up comes from heavenly journey books from ancient heretical forms of Judaism. For example, you go up into heaven and see the left and right choirs of angels. The right choir is a little bit better or more glorious, and the left choir imitates the right choir. You've got the master (protopsaltis) who has gone through all the ranks, then the lambadarios. Then you've got the first Domestikos and second Domestikos, those are the helpers. Then you've also got the canonarch, that's the kid. He is training to be the next protopsaltis. They weren't allowed to look at the books because that was a crutch. You would have the cantors on the two sides and canonarch would be on the one side and feed the lines to the protopsaltis. I've been told that this was from the early church; at monasteries they didn't have multiple sets of liturgical books, so the canonarch would stand in the middle and feed the lines to the two sides.

**Author:** With so many cantors, were specific methods of execution and vocal technique not taught?

**Nick:** For so long it's just been, they'd select who was going to be the cantor at the age of seven. They'd select boys at that age to be the next crop. They only picked you if you already had good resonant singing. Then you'd spend the next 20/30 years of your life surrounded by older guys who had good resonant singing. If you listen to places that had good systems like the older patriarchate: they all had these big resonant voices, and they all had a similar sound. They just knew how to do it from being around, but they also had a lot of instruction. Many of these guys, this isn't so true anymore, but many of these guys knew all sorts of different kinds of music. They were taught things. Leonidas Asteris was trained in opera. I don't know to what extent vocal technique was part of the instruction they gave in those places, but there were certainly a lot of people who were instructed in that kind of thing. People were surrounded by good examples and that made for a sustainable system. Also, the people who were unable to succeed were just weeded out of the system.

This explanation is extremely enlightening because it opens a window into the past and explains the pedagogical situation in modern times as well. In modern America, most people learning to chant are not spending 20 to 30 years amongst the best cantors in the world, but instead are learning from books and recordings and maybe professional cantors on a weekly basis. Therefore, the need for detailed information about technique is especially relevant for today's students of chant even more than it would have been for the acolytes of the past. If they can learn not only what sounds are desired, but how to properly execute those sounds, they will be less likely to experience fatigue.

**Author:** How do you pitch a piece? Do you have trouble finding a good starting pitch for everyone you're singing with?

Byzantine notation does not indicate a specific pitch on which to start. Therefore, pitching is exceedingly important in Byzantine chant, especially due to its monophony. There are no harmonies to allow different types of voices to sit comfortably in their own ranges.

**Nick:** ...you've got to negotiate everybody's ranges; you're not divided into parts so you've got to find a happy medium for the group. Not everybody does that, it

wasn't done for me. Everybody would always pitch things really, really, high for me. I can negotiate that now because you've shown me what to do with the *passaggio*, but before they were just like 'What's your problem? Just sing it higher.' But that's just absence of knowledge of vocal technique, like you were saying. The reason this happens is that most of the great psaltes of the 20th century were tenors and now people just pick those pitches. Also, a lot of it is people marrying Byzantine relative pitch with Western absolute pitch. They say that 'Πα is going to be a D.'" or "Δι is going to be a G.'<sup>92</sup>

Πα and Δι are parts of the solmization system for the Byzantine scales, called *parallage*.

Nick: That can lead to things being pitched uncomfortably high for many people and sometimes just too high or just too low. In the Byzantine system, if you're going to be consistent with your pitch, Πα in one mode is *not* in the same spot as Πα in another mode. That's not how the modes work, they weren't made with that system of *parallage*.

Nick, like Fr. Romanos, mentioned that a high tessitura leads to fatigue. According to Nick, students of Byzantine chant in America are trying to find similarities between Byzantine and Western intonation which can cause them to pitch too high. This appears to stem from the lack of oral immersion into the sound world of Byzantine chant which the young cantors of the past had. When Dr. Sarah Roumas's interview is reviewed, the way in which she overcame that challenge will be revealed. The final portion of Nick's interview covered female chanting, which is the topic of the next section.

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<sup>92</sup> Byzantine scales are not based on fixed pitches, therefore the Byzantine solfège system (*παραλλαγή*) can't be assigned to begin on any fixed pitch.

## Chapter Four, Part Two: Dr. Nick Roumas, Female Chanting

During our discussion, Nick had many questions about the female voice due to his current instruction of female students. This section gives light to the potential difficulties that female cantors experience as well as the lack of knowledge that cantors have concerning not only the female voice, but the voice in general.

**Nick:** Is the female range just an octave higher than the male range? Because a lot of women I've worked with prefer to pitch things lower than men, including me.

This is perfectly understandable due to the registral shift in the female voice. To understand this shift, the registers must be defined. Christian T. Herbst explains that the chest and head/falsetto registers are mainly controlled by the contraction or relaxation of the thyroarytenoid muscle.<sup>93</sup> The thyroarytenoid muscle makes up part of the body of the vocal folds. What Herbst meant in simple and clear terms is when the thyroarytenoid muscle contracts, it becomes shorter in length and the vocal fold mass increases; this vocal fold configuration creates chest voice. When the thyroarytenoid muscle relaxes and the cricothyroid muscle stretches the vocal folds, the vocal fold mass decreases; this vocal fold configuration creates either falsetto or head voice. Untrained female voices tend to try to push up their chest voice register higher than it is supposed to go, especially when they are going from low to high which can cause fatigue. This is why an understanding of the registral shift in the voice is so important.

**Nick:** I've been running into a lot of female students who, when we do the basic exercises, I can hear that they are pushing or straining when they get up to C5. I ask them 'Is that uncomfortable for you?' and they say, 'No.'

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<sup>93</sup> Christian T. Herbst, "Registers--The Snake Pit of Voice Pedagogy," *Journal of Singing* 77, no. 2 (December 11, 2020): 175–90.

From her teaching experience, the author has observed that untrained singers are often unable to feel their physical effort at first. They must be trained to increase their proprioception to feel their own sensation of physical effort. Therefore, Nick's statement was unsurprising.

**Nick:** Is it hard to navigate the transition between those registers?

**Author:** Depending on the skill of the singer it can be. With an untrained female singer, it usually is.

**Nick:** So, it would make things hard for you if you had to chant with something pitched right around that transition point. For men, regardless of whether it is baritones or tenors or whatever, the E or F is going to be a sweet spot in terms of pitching things, but it seems to be the worst possible spot to pitch things for women, and it makes things harder for them. Should I tell these students that they need to go to a voice instructor who knows how to do this to learn this (navigating the registral shift)?

Nick's inquiries show that, after taking voice lessons with a certified vocologist, he became increasingly interested in maintaining vocal health for himself and his students. His new interest in vocal technique and vocal health after voice lessons, but not before, exhibits missing information in the pedagogy of Byzantine chant.

**Nick:** There needs to be a way to work on this. Right about half, if not more than half of the students I get are female and... there is this thing that happens where they get sequestered or sequester themselves. For example, there's a woman who has learned a few things and then teaches all the women. Often, the men in charge try to sing with them a bit, but it doesn't sound right and then they put all the women together by themselves. It's just not good for learning because the immense plurality of the knowledge is being held by men right now. So, there has got to be a way to get them to work together. We don't want this thing that happens where the women are either voluntarily or involuntarily all learning together just amongst themselves and they end up having a totally different sound than the men. How can they learn all the stuff, the advanced stuff and how does that translate into their voices?

It is wonderful that Nick now has so much interest in improving the pedagogy of Byzantine chant. His inquiries into these issues are exactly what this author is trying to answer.

The discussion of the female voice concluded Nick's interview, which provided a clear insight into his experience with the pedagogy of Byzantine chant. As was previously noted, Nick was not clearly taught breathing techniques or techniques of resonance. Instead, he was trying to match sound through imitation and listening instead of feeling the sensation of the sound. Per his report, this resulted in vocal fatigue and sometimes difficulty tuning. This investigation further elucidated the missing piece in Byzantine pedagogy: the overall lack of voice pedagogy.

## Chapter Five: Interview with Dr. Sarah Roumas

Again, to understand the pedagogy of Byzantine chant in America the author felt it necessary to give information on the interviewees history of studying chant. Therefore, the information provided by Dr. Sarah Roumas's interview will begin with her study of chant which, unlike Dr. Nick Roumas and Fr. Romanos, began at Holy Cross Hellenic College.

**Author:** Can you talk a bit about your experience at Holy Cross?

**Sarah:** "When I first came to Holy cross, I was not Orthodox, I was Episcopalian. I had never been exposed to Byzantine chant or any type of Orthodox music before coming to Holy Cross."<sup>94</sup>

Before coming to Holy Cross, Sarah took voice lessons in high school, but she explained that,

...in College, I sort of stopped singing, and then I was in an Episcopalian monastery for a few years after college, so I was chanting there. We did a very quiet subdued controlled version of Anglican Gregorian chant (at the monastery) and I liked that a lot... and then I went to Holy Cross and my mind just exploded!

Due to this, her perspective is extremely valuable because, unlike most of the students of Byzantine chant, she had no link to the sound world of Byzantine chant prior to attending graduate school. The sound world was so different that she said,

I went back to visit my old monastery and I literally could not believe that it was the same place, because I lived there for three years. Then I heard Orthodox worship for a year and a half... and it was crazy how different my ears had become!<sup>95</sup>

This is a testament to the great disparity between the music of the West and of the East and to the difficulty that is posed to Western musicians learning Byzantine chant.

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<sup>94</sup> Sarah Roumas, interview by author, December 6, 2022.

<sup>95</sup>Roumas, interview

**Author:** When did you graduate and how long did you study there?

**Sarah:** I graduated with two degrees, Master of Theological Studies, and a Master of Theology, in May of 2016. Nick joined Holy Cross in 2014 to complete his MTS. The ThM is a year of classes and year of writing master's thesis. I completed this degree because I felt it would be helpful for PhD applications. At the same time, I was still working hard to learn chant. So, I was doing these two academic degrees, and I was also packing in as many chant classes as I could. By the end of my third year, I got my chant certificate.

**Author:** Who were your teachers? Can you give more details about the pedagogical process?

**Sarah:** Fr. Romanos taught all of my classes. Then I worked a few years on the side with another teacher, who was super helpful, because Fr. Romanos is Greek trained. He was at a Western-ish school growing up, but it was still in Greece, so his musical training is still very fundamentally Eastern. My other teacher is very much at home in both worlds. It was much easier for me to come into byzantine chant with his insight. He was much better at communicating with me, in those first couple of years, about how to change my voice to do what I wanted it to do. He could hear at times that I was trying to mimic what I was hearing, but without changing what was going on underneath my voice. I was trying to mimic what I heard without taking the route people took to get there.

**Author:** Can you explain this in more detail?

**Sarah:** For example, he would write out the ornaments in Western notation because I found it difficult to hear them at first... a certain amount I also remember working on a certain amount of Greek articulation, but I had also learned that from Fr. Romanos.

The articulation that she speaks of, is not just pronunciation, but the pulsing of the lines that Nick spoke about previously.

**Sarah:** Another thing was, at some point, I was deliberately singing sort of nasally and he said, 'I hear what you are doing, and it makes sense, but in fact that is not what is producing the nasal sound you are hearing. So, lay off the nasal tone for now and as you get better at what you're trying to do, the nasal quality will come in more naturally.'

**Author:** Do you think what you were hearing was the ping produced from singing into the resonance?

Ping can also be called squillo which is defined as, “the resonant, trumpet-like sound in the voice of opera singers. The purpose of the squillo is to enable an essentially lyric tone to be heard over thick orchestrations, e.g., in late Verdi, Puccini and Strauss operas.”<sup>96</sup>

**Sarah:** I think I would say that. It’s certainly very different from what I would have done to produce a nasal tone... if you ask me to sing nasally, it is very different from what I would do when I’m chanting. So, yeah, I think it has a lot more to do with the resonance or the placing of the resonance. But, like I said, it is not something I consciously worked on, but it developed more naturally.

While her teacher may have been versed in the topic of resonance, he did not prioritize it in lessons and therefore he didn’t teach Sarah to reproduce the sound in an efficient way.

**Author:** Did you and your teacher talk about breathing? What did you learn about it?

**Sarah:** I think that is one point on which he (her teacher) and Father Romanos diverge, they wouldn’t have a debate about it, they are just different. Father Romanos is very much like, ‘You take a breath whenever you need a breath’... almost across the board, and I know this is very true for a lot of Greek cantors and a lot of Greek singers also. They don’t have the same concern with placing breaths that Western musicians do. So, he (Romanos) just says ‘Yeah, wherever, in the middle of a word, it does not matter...’ and my teacher is more Western in his sensibilities.

**Author:** In what way?

**Sarah:** His thoughts on breath were not anything major, but just what I would expect from my Western teachers... breathe so you get support for the line you are going to sing. Whereas Fr. Romanos would say, ‘eh take a breath in the middle of the line, that’s fine.’

Here, the discrepancies of breath between the two teachers are merely about breath placement. Notice that there was not necessarily discussion of how one breathes or where the breath is felt in the body. Again, there is not an emphasis on sensation, but rather on sound and

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<sup>96</sup> “What Does Squillo Mean?,” accessed May 18, 2023, <https://www.definitions.net/definition/Squillo>.

listening. This type of pedagogy doesn't inspire the student to breathe properly or to use flow phonation to reduce fatigue.

**Author:** Since there is such a variety of music sung in the church throughout the year, doesn't it force cantors to sight read often and prevent them from planning breaths?

**Sarah:** Yes, before you have made the leap to  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$ . When you are still reading by neumes rather than  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$ , that is when it changes. When you are reading  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$ , suddenly you are reading sentences instead of reading letter by letter and I think that really changes how your breath is approached. But before that, you are very much at a disadvantage in terms of planning your breaths. I really like the analogy that reading  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$  is akin to reading English; when you look at a letter in English it could be pronounced in five different ways, you have to know what word you are in to know how a letter should be pronounced. That is the way it is with chant. You are going to do it in very different ways depending on what  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$  it (the neume) is in the middle of.

Even though reading  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$  becomes similar to reading words eventually, it would still mean that the cantor is sight reading by  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$  instead of planning breaths in advance.

Typically, when breaths are not planned, the singer is unable to continuously exhale while singing. This may cause the singer to use pressed phonation, which can occur due to diminished airflow. However, when there is an increased lung volume, it has been found to increase tracheal pull which can cause abduction.<sup>97</sup> Abduction is the opening motion of the vocal folds. During pressed phonation, one of the issues, as discussed earlier, is hyper-adduction, which is the over-closing of the vocal folds. Therefore, when a singer is taking unplanned breaths, they won't necessarily have time to take a deep breath, which increases their lung volume. When breaths are planned, the singer takes a deep/high lung volume breath

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<sup>97</sup> Jenny Iwarsson, Monica Thomasson, and Johan Sundberg, "Effects of Lung Volume on the Glottal Voice Source," *Journal of Voice* 12, no. 4 (January 1998): 424–33, [https://doi.org/10.1016/S0892-1997\(98\)80051-9](https://doi.org/10.1016/S0892-1997(98)80051-9).

at the beginning of the song which they can refill as the song continues. This kind of breathing technique could greatly benefit the Byzantine chant community and aid in reducing vocal fatigue.

**Author:** What did you listen to, to learn chant? What was your experience with listening?

**Sarah:** I was starting to get really excited about chanting. Maybe at the end of my first year, I began to realize the difference, the depth of the distance, between Byzantine tuning and intonation and Western approach to intonation. So, I didn't listen to Western music for years, I just stopped. I did not ever have the radio on, because I wanted to retrain my ears. I wanted them to forget the octave and forget major/minor, forget all of that stuff and to hear nothing but a microtonal approach. Doing this was extremely helpful. Also, when students started attending the higher-level courses of the chant program, Fr. Romanos was constantly sending out things for us to listen to, which was also helpful. And, being at the college, many people were listening to chant in their rooms, so I was able to become fully immersed in Byzantine Chant.

Sarah's approach to listening was certainly more intense than many other cantors. However, her full immersion into Eastern Music was how she prevented herself from matching the Eastern pitches to notes in the Western scale. Her understanding of the depth difference between the two tonal systems helped her to become the excellent cantor that she is.

**Author:** What are your thoughts on pitching, do you have any issues with it?

**Sarah:** I don't really have issues with pitching; however, I do hear many women complaining about it. About getting into a comfortable range. I learned the most about how to really be at a chant stand next to Fr. Romanos. Our ranges happen to do just fine together. I sing an octave above him, almost all the time. He is deliberate about his pitches. He is also deliberate about changing the tuning as the service goes on. He was aware of what his voice could handle, so first thing in the morning, he would start with a lower pitch and then as the service went on, he could handle much higher pitches so the pitch would go up. So, I never had any issue with the pitches. I happen to be able to handle most men's ranges an octave up. But I know it's an issue. A lot of women like to move the pitch down, I've known women who like to have the pitch a fifth below what most men would choose and that is an issue. That can really be an issue when you are trying to sing in a mixed group, which we are, no one is chanting with all

women. Speaking of all women, I remember going to Ormylia Monastery<sup>98</sup>, which has very serious cantors. They pitch stuff way low.

**Author:** Do you think this happens because the female cantors don't want to leave chest voice?

**Sarah:** In some cases, this becomes a theological issue because if you leave chest voice, you sound too womanly and that is not appropriate. They (at Ormylia) will quote their founder about how they should sound manly. It's a monastery of women, and it is packed with women, yet they are trying to sound like men. I think it becomes really problematic. I don't understand why because there is a huge culture of, if you are a tenor, go as high as you possibly can. But if you are a woman and you do that, the eyebrows are not going to be approving. So, that was something I struggled with a little bit with Fr. Romanos. He was having me do a lot of *Axion Estins*<sup>99</sup>, and a lot of the modern *Axion Estins* will have you zoom up an octave at the end of the piece and go over the octave if possible. Fr. Romanos was always asking me, 'Why don't you end, why don't you go an octave up, I know you have those notes?' I know I have them also, but I am not really comfortable doing that kind of show-offy stuff. And there is nothing wrong with showing off because that is a very flashy piece and it's at a flashy point in the service. At that time, I didn't feel very comfortable with that because I am a woman; especially at that time.

Here Sarah touched on the role of women in Byzantine chant and the various issues that they must face. More will be said about this at the end of the chapter.

**Author:** I understand that the range of Byzantine chant is typically around the registral shift in the female voice, do you switch registers often when you chant?

**Sarah:** Yes, I will switch registers. Fr. Romanos and I used to talk about this, how the morning services are often orchestrated so that that works out nicely because you start with some short range hirmologic<sup>100</sup> stuff and then as the morning goes on you get into the larger range stuff. When we're talking about short hirmologic pieces, I am not changing all that often, but when we are in an octave-based piece, I change all the time.

**Author:** How do you think untrained singers perform when learning to chant?

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<sup>98</sup> For more information on Ormylia Monastery please see: <https://www.ormyliamonastery.com/en/>.

<sup>99</sup> Axion Estin, is a hymn to the Mother of God. Axion Estin means It is Truly Meet.

<sup>100</sup> This refers to music that is syllabic instead of melismatic.

**Sarah:**

I think that most cantors could very much profit from having some voice lessons. More generally about pedagogy: Nick thinks that the chant program at Holy Cross is over ambitious in terms of its repertoire. Maybe he objects to the fact that a lot of it is required for people who aren't actually going to become cantors. The way the program is set up is largely repertoire driven. Like, 'Here is a book, you'll learn the book by the end of the semester.' Start with the Anastasimatarion, for example. At the time I felt that it was very challenging because there was just more and more and more and more (repertoire). Especially because I was taking multiple classes at the same time. That was very difficult for me to do. Now I see the point of it, I really do. I think it is because it is a musical repertoire that is defined by itself. So, the valid  $\theta\acute{\epsilon}\sigma\epsilon\iota\varsigma$  that you need to know are in the books and that is why it's useful to learn the books. Back when I had time to study chant, that was how I self-studied, it was entirely repertoire driven. When I was in coursework at Notre Dame... Fr. Romanos would give me recommendations and I would send him recordings. So, we had asynchronous teaching going on. I would take a piece and I would learn it by heart... and get it to the point where I felt comfortable chanting in church just from the text, which is terrifying. But it's so good and it changed the way I understood the music. If I still had the time, as I did in Holy Cross, I would pick a piece of repertoire and I would study it without written music. I would study it with just text and recording. That is interesting to me, because so many people, that's how they learn to chant. In a way, it's against everything Holy Cross is standing for, which is to teach everyone in America the notation. I understand that, but I think that learning orally is also good. Again, with the language metaphor, we are teaching people to read a language they do not speak, and that is very difficult... it's a mnemonic device, far more than Western notation, it is not designed for sight reading, however, if I had tried to do that in Holy Cross, I would not have learned one piece of music. The first time I had to learn a piece of music by heart for Fr. Romanos, I had a really hard time with it, even though it was simple and short. I think it was because it was so unfamiliar. Even if people came in without any background at all in Byzantine chant, most people at Holy Cross had been going to Orthodox services. One of the last things I learned was the funeral evlogitaria,<sup>101</sup> but everyone else knows them because they are done in church, but not at the chapel. There were many hymns that everyone knew from hearing them their whole lives that I never learned because they weren't done in the chapel, and I didn't grow up Orthodox. Another thing that helped was learning in the school choir. My first year no women were in the school choir. Father Romanos was really trying to get women into the school choir so, my second year, when I was still very new, I was in it and another woman was in it. I was in the school choir for three years and that was so good. Having the time

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<sup>101</sup> These are hymns for memorial services, typically performed at the end of liturgy on Sundays in parishes.

and pressure to go over a limited section of repertoire good enough for performance just facilitates an engagement of the material that keeps the material from flying by you. Then, of course, you are in a choir situation, so it enables a lot of community learning.

**Author:** Was it easier to sing in the choir, to sing in a group?

**Sarah:** Not really, you were still expected to perform well alone. Father Romanos would say, 'That line is not good, I want everyone to do it one by one, go!' He really liked to do that. We did that in class also... we would be doing a piece that we had done a couple times as a group so we would do it, θεΐσις by θεΐσις and we would just go around the room, but only in his later classes. Something I should also say is that he (Fr. Romanos) is a musicologist, which is a very rare among Byzantine cantors. That had more of an impact on my learning than I realized at the time because I am an academic and so I assumed an academic approach was standard, but of course that is wildly unusual. So, when we were learning the Kalophonic Heirmologion<sup>102</sup> we had to learn the manuscript shelf numbers of the ten most important Heirmologion manuscripts. That's not the sort of thing you normally have to do when trying to learn Byzantine chant. And a lot of it left (my mind), but a lot of it didn't. And it's very, very, different having that historical and academic perspective, instead of what a lot of people get which is more *personality* driven. Like, 'My teacher says XYZ and all the haters say A and so you therefore must hate the A.' There is a lot of that. Fr. Romanos knows all of that and he presents it in sort of an overall way where you hear what different cantors believed.

Sarah's interview provided unique insight due to both her complete unfamiliarity with Byzantine chant prior to learning it and her female perspective. From her statements as well as Nick's it is clear that, many female cantors are unaware of what their own voices require. Also, many teachers of Byzantine chant are male and the field in general is male driven. This is primarily because other than in monasteries, chant was not accessible to women until more recently. As a result, it is sensible to presume that, in America, there is not much knowledge of

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<sup>102</sup> Arsinoi Ioannidou, "The Kalophonic Settings of the Second Psalm in the Byzantine Chant Tradition of the Fourteenth and Fifteenth Centuries," n.d. The Heirmologion is a book which contains settings for each of the modes, the kalophonic style is a "newer" melismatic style.

the female voice among cantors. As Nick mentioned, hymns are often pitched around the registrational break in the female voice which makes chant difficult to navigate for a novice female singer. As previously stated, this will often result in switching to head voice too late which can cause pressing. Pressing can also occur in the male voice, however, in Byzantine chant where most pieces do not cover a large range, men will not be as tempted to strain their voices as often. Overall, the fatigue cantors experience, male and female alike, can be due to both pressing and inefficiency. It is evident from all the interviews that much of the pedagogy of Byzantine chant centered on replicating certain sounds, learning history, and repertoire; all of which are very important, but do not guarantee vocal health.

## Conclusion: Problems and Potential Solutions; Further Research

At the outset of this project, I desired to understand the potential causes of vocal fatigue among cantors and once discovered, to find solutions to them. From the evidence, it appears that most of the vocal fatigue experienced by cantors is caused by varying degrees of pressed phonation and various vocal inefficiencies over long periods of time. These are likely caused by the following factors:

- ⦿ The lack of vocal technique being taught to chant students by their teachers. From the interviews, it appeared that the teachers thought about things around vocal technique, but they only thought about them in terms of how to match certain sounds, not sensations. There also did not appear to be much knowledge about the physical methods required to achieve the desired sounds. As a result, there is not a consistent pedagogy of vocal technique. This can cause students to attempt to achieve the desired sound in a variety of ways, some healthy and some unhealthy, such as pressed phonation.
- ⦿ Many female cantors have approached the author due to complaints of vocal fatigue. This is often due to the issue of female cantors singing with male cantors. In America, this happens all the time in group chanting. Also, even when chanting alone, during certain parts of the service, the cantor must match the pitch of the priest who is always male. For trained female singers this does not pose an issue, but, according to the interviews and personal experience of the author, it appears that many female cantors are untrained and, as a result, tend to switch registers too late, resulting in pressed phonation and vocal fatigue.
- ⦿ The volume of repertoire is also an issue. Each service has changeable parts and even seasoned cantors still require the texts to the services. This means that, there are many

hymns that the cantors are still sight reading. Again, this causes breaths to be unplanned, often resulting in low lung volumes which can lead to pressed phonation.

- ⊙ Another small circumstance that was not previously mentioned is the communion fast. In Orthodoxy, if one wishes to partake of holy communion, they must fast from food and drink before. Therefore, during a morning service, the cantor would have had nothing to drink since the night before. The negative effects of dehydration on the voice are proven, “Systemic dehydration as a result of fasting and not ingesting fluids significantly negatively affected the parameters of noise-to-harmonics ratio (NHR), shimmer, jitter, frequency, and the s/z ratio.”<sup>103</sup>

Since the primary cause of the cantor’s fatigue appears to be a mixture of pressed phonation and vocal inefficiency, the myriad circumstances that result in pressed phonation and various inefficiencies all have the same answer: educate cantors on the voice and vocal technique. This can be accomplished by sending cantorial students to Western voice teachers, or more specifically, vocologists (people with a broad background in the anatomy, physiology, and acoustics of the voice), or potentially holding a meeting between cantors and educated voice professionals to increase their knowledge of voice pedagogy.

It is understandable that cantors have not made many strides into the voice world. Byzantine chant is first and foremost an expression of prayer and it is extremely difficult to learn. The tonal system alone takes a long time to master. However, it is the author’s hope that

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<sup>103</sup> Maxine Alves et al., “The Effect of Hydration on Voice Quality in Adults: A Systematic Review,” *Journal of Voice* 33, no. 1 (January 1, 2019): 125.e13-125.e28, <https://doi.org/10.1016/j.jvoice.2017.10.001>.

this document will provide insight for the voice world and encourage cantors to explore more about the voice.

This topic requires further research. The limitations of COVID-19 deeply affected the amount of data that was able to be acquired. In the future, it would be very interesting to expand this study to Greece and the Middle East and to increase the data points with items such as amount of glottal flow, subglottal pressure, and vocal fold contact time.

The author is deeply gratified by your review of this document. May it prove itself to be fruitful for anyone who reads it.

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