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AN ANALYSIS OF PHONETIC SONORITIES AND VOCAL-PIANISTIC INTERSECTIONS IN RIMSKY-KORSAKOV'S OP. 2 ROMANCES

Abstract: This study examines Rimsky-Korsakov's Op. 2 romances through a corpus-based phonetic-musicological analysis of stressed vowels and sonorities, also how the composer approaches Russian- and German-authored Russian-translated poetry. The study adopts stochastic musicology to: (1) allocate compositional differences in Rimsky-Korsakov's tactics to musically depict the text; and (2) define the composer's choices as either (a) compositional nonconformity used to interpret the poetic meaning, or (b) stylistic deviations within the holistic view of the four works within Op. 2. Based on systematic detection of patterns in text-music relationships and the concurrent links between the musical settings and phonetic-structural features of each verse, the research ties the results to an explicitly Russian musical identity while addressing distinct analytical gaps that traditional theoretical and musicological approaches leave unresolved.

Keywords: music, phonetic-musicological study, poetry, Rimsky-Korsakov, romance, stochastic musicology

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1. Introduction

Nikolai Rimsky-Korsakov (1844–1908) is a central artistic figure in Russian Romantic music, with innovative approaches to setting musical text and novel compositional tactics that paved the way for innovative paths of orchestration.[1] Rimsky-Korsakov's continual efforts to shape the Russian national identity and character in music contributed to his work and influence within the Mighty Five, leading to a broad repertoire and a cemented legacy in performative and academic circles.[2] Rimsky-Korsakov's attempts to develop an inventive style began early in his career, seen in his early compositional period between 1865 and 1870. One of the first published works in Rimsky-Korsakov's oeuvre includes the four vocal romances from Op. 2.

Russian vocal romances were a new genre of music, with myriads of composers choosing to try their hand in these small-scale settings of text. The romances did not appear unexpectedly, as Russian composers were still influenced by Romantic music from the West, with "lieder" being the genre most reminiscent of the images of the vocal romances.[3] With that, the genres of lieder and vocal romances share a commonality – the sheer number of these compositions throughout history generated a large range of works that can now be compared and analyzed within their own genre. Lieder and vocal romances continue to appear among the performative circles across concert halls and are key to a singer's solo repertoire. However, vocal romances did not enter mainstream analysis for Rimsky-Korsakov, as analyses on his operas, teaching methods, and orchestration techniques continue to be considered as conventional research within scholarly literature.[4]

The following research is an empirical look based on previous dissections of harmony and the relation among Rimsky-Korsakov's intersection of poetry, vocalism, and his compositional language in his early-period romances.[5] The research seeks to extend the understanding of Rimsky-Korsa-

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[1] Nikolai Rimsky-Korsakov, *Principles of Orchestration*, Garden City, New York, Dover Publications, 1964.

[2] Richard Taruskin, "Catching Up with Rimsky-Korsakov", *Music Theory Spectrum*, 33(2), 2011, 170.

[3] Tim Parker-Langston, "The Lied at the Crossroads of Performance and Musicology", *Music and Letters*, 107(2), 2026, 354–358. https://doi.org/10.1093/ml/gcaf083

[4] Marina Frolova-Walker, *Rimsky-Korsakov and His World*, Princeton, New Jersey, Princeton University Press, 2018.

[5] Nikita Mamedov, "The Premonitory Point and the Real Apex in Rimsky Korsakov's Op. 4 No. 1 Romance", *Musicology and Cultural Science*, 2(20), 2019, 62.

kov's early-style compositional language by combining the interactions among music and text with a series of empirical examinations.[6] The study offers a corpus-based, stochastic, phonetic-musicological analysis of Rimsky-Korsakov's four romances from the Op. 2 cycle. Rooted in Russian and German Romanticism, the four songs represent the composer's first foray into vocal music, calling for a detailed documentary into his creative development and early experimentation with settings of poetic text to music. In the cycle, Op. 2 Nos. 1 and 4 are titled *Lean Thy Cheek to Mine* and *From My Tears*, both authored by Heinrich Heine (1797–1856) and translated by Mikhail Mikhailov (1829–1867). The Op. 2 No. 2 is titled *The Nightingale Enslaved by the Rose*, authored by Aleksey Koltsov (1809-1842). The Op. 2 No. 3 is titled *Lullaby*, set to the poetry of Lev Mey (1822–1862). While the Op. 2 romances are traditionally viewed through literary symbolism and the poetic meaning within Rimsky-Korsakov's compositional style, the following research proposes a computational approach to understand how musical prosody varies among original Russian poetry and the translations of Heine's German verses, and to what extent Rimsky-Korsakov aligns his compositional style based on the poetic sonorities. Therefore, the study aims to test whether Rimsky-Korsakov treats the phonetic architecture of a translation differently than when compared to the original Russian text.

The following research applies empirical analyses to examine the text based on words, their respective stressed syllables, and sonority levels, focusing on Rimsky-Korsakov's compositional approach within harmonic pathways that musically characterize the poetry. More specifically, the study – through the analysis of sonority levels and their respective patterns in each poem using statistical tools such as contingency tables, Markov's transition matrices, and Analysis of Variance – aims to show the substantial distinctions in Rimsky-Korsakov's approaches to the integration of piano and voice based on poetic thematics and the poet's nationality. Rimsky-Korsakov's musical examples from Op. 2 integrate a mixture of Schenkerian techniques. The Muzgiz edition [Rus: Музгиз] was used for musical examples employed for the purposes of various analyses.[7]

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[6] Nikita Mamedov, "Foreign Literature in Russian Music: Thematics and Symbolisms of Rimsky-Korsakov's Op. 4 No. 2 Romance", *Musicology and Cultural Science*, 1(21), 2020, 5.

[7] Nikolai Rimsky-Korsakov, *Complete Collected Works* [Rus: *Полное собрание сочинений*], Moscow, Muzgiz, 1946.

2. Research literature

2.1. Summary

Three main themes enfold the research literature in this study. The first theme is Rimsky-Korsakov's compositional style and previous scholarly output that help define the theories behind the composer's artistic language. The second theme is the scholarly output on the Russian vocal romances and what distinguishes the genres within academia. Specifically, a focus on music, literature, and composers' interpretations plays a role in how romances developed in the Russian oeuvre over time. The third theme is an empirical approach to understanding phonetics and linguistics in the arts. A context within which a framework can outline a methodology offers an objective way to compare the linguistic capacities in the text and understand compositional strategies used to set such text to music.

2.2. Rimsky-Korsakov's Compositional Style

Maria Skuratovskaya's study traced the stylistic evolution of Rimsky-Korsakov that reflects the composer's pedagogical approach.[8] Rimsky-Korsakov's early pedagogical philosophies start becoming visible in the small-scale Op. 2 vocal romance composition as the composer establishes his compositional language. Furthermore, the composer's educational philosophies reflected his artistic approach to harmony and the way his music transformed over the course of his career. Focusing on Rimsky-Korsakov's operas, Skuratovskaya outlined influences within the composer's pedagogical output on his compositional practices and how his artistic and stylistic innovations defined a unique style of transformative Russian music. Considering what Rimsky-Korsakov found prominent in his pedagogical material helps understand his compositional mindset and the way the composer's educational philosophies aligned with how he composed music. Understanding the parallels between Rimsky-Korsakov's pedagogy and composition likewise helps in comprehending the composer's artistic apparatus that helped shape the development of large-scale genres such as opera.

One innovative component of Rimsky-Korsakov's compositional output is the use of hexatonicism, particularly in his operas. The use of hexatonic progressions helped Rimsky-Korsakov outline the boundaries of his tonality,

[8] Maria Skuratovskaya, "Rimsky-Korsakov: Principles of Orchestration and Three Operas on Historical Subjects", *Contemporary Musicology*, 2, 2022, 128.

allowing the composer to expand his harmonic innovation while remaining within a clear and coherent compositional system. In his study, Philip Ewell defines the composer's utilization of hexatonicism and what compositional advantages such an approach brings to the structural harmony within Rimsky-Korsakov's music.[9] Ewell likewise identifies three different meanings and dramatic levels in each of the three hexatonic structures that help define Rimsky-Korsakov's compositional language. While the hexatonic approach is not the mere approach that Rimsky-Korsakov utilizes to systematize his compositional language, the use of such a technique in his harmonies allowed for transformative ways to move among different key areas while sustaining tonal coherence.

Larisa Jackson utilized Rimsky-Korsakov's harmonic theory to understand his compositional language and its development over time.[10] The study outlines harmonic functionalism in Rimsky-Korsakov's works and helps outline the specifics of stylistic innovations that the composer utilized in his works. By defining the harmonic functionalism present in Rimsky-Korsakov's music, one is able to identify the specifics of stylistic innovations and apply these to various repertoire over the course of Rimsky-Korsakov's career. The study likewise leverages Rimsky-Korsakov's individual pedagogical systems that are defined as theories, allowing for a broader comparison of how the composer's own systems were used in his music. The traditional harmonies and Rimsky-Korsakov's approaches to tonal music across various genres of his compositional oeuvre can be explained by his harmonic theories, developed as part of his teaching.

2.3. Russian Vocal Romances

One way to characterize Russian romance in the early nineteenth century is as a hybrid genre that synthesizes Western European classical music with Russian folklore artistic elements. This study argues that the genre of Russian romance enabled composers to experiment with earlier Western vocal models and to integrate melodic and rhythmic contours by incorporating Russian

[9] Philip Ewell, "On Rimsky-Korsakov's False (Hexatonic) Progressions Outside the Limits of a Tonality", *Music Theory Spectrum*, 42(1), 2020, 125.

[10] Larisa Jackson, *Rimsky-Korsakov's Harmonic Theory: Practical Manual of Harmony, Its Sources, History, and Traditions*, Denton, Texas, The University of North Texas Press, 2022.

folk structures into a novel musical framework.[11] Through such synthesis, Russian composers had the opportunity to restructure previous vocal genres and provide the Russian vocal romance with a sense of national identity and Russian consciousness. Rimsky-Korsakov's Op. 2 romances, based on Russian and German poetry, reflect such an idea. The bifurcation between two poetic traditions allows the composer to establish an architectural foundation for his compositional style within half of the Op. 2 cycle while evoking foreign German poetic symbolism within the other half of the Op. 2 cycle.

While academic studies of Russian vocal romances are limited in Western scholarly literature, the genre's evolution and the artistic approaches of numerous composers deserve emphasis, given the stylistic developments composers have pursued across history. Rimsky-Korsakov was one of the composers to become prolific in this genre, yet he was not the first Russian composer to create works in this genre. Elena Klimenko looks into early nineteenth-century Russian romances and vocal repertoire that serves as a precursor to Glinka's romances and succeeding composers, including Rimsky-Korsakov.[12] The study's purpose is threefold. First is Glinka's integration of musicality and aesthetics within the Russian artistic traditions to formulate a genre of romances, while setting distinct qualities and elements that inspired generations of future composers to undertake vocal romances. Second is the notion of romance being the genre where musicology and vocal performance intersect, leading to the understanding that the musicological and interpretative nature of poetry is relevant and foremost to understanding the compositional approach taken in the creative process. Third is the role of folklore in Russian romances, and how such a role's importance to Glinka and his Russianized musicianship allowed Glinka to view and interpret romances as unique genres that necessitated a particular compositional approach.

Although romances are short-scale works for voice and piano accompaniment, the intersection of lyricism, expressiveness, and musical understanding of harmony and poetic text demands a novel level of emotional sincerity

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[11] Olga Guseynova, Omer Turkmenoglu, "Russian Romance: Synthesis of Classical and Folk Music at the Beginning of the 19th Century", *Journal for Interdisciplinary Art and Education*, 3(3), 2022, 112.

[12] Elena Klimenko, "The 18th – Early 19th Century Russian Romance Song as a Precursor of M. Glinka's Works", *Proceedings of the 2nd International Conference on Education, Language, Art and Intercultural Communications*, 2015, 509.

on the part of the composer, as Eryong Li found.[13] There are multiple prominent components that composers take into consideration when composing in the genre of romance. For Rachmaninoff's twentieth-century romances, having composed romances in the latter part of Romanticism, the notion of melodic expansiveness and linguistic precision in romances was of the foremost priority. In theory, artistic layers can be extracted within a romance; an example can be instrumental, as seen in the vocalist's melodic line and pianist's accompaniment. At the same time, music and text are likewise inseparable, as music defines poetic characteristics reflected by the text's author. Therefore, a framework can be established where music analysis within the vocal romance should justify the composer's stylistic approach based on the poetic actions taken by the text's author.

2.4. Phonetics, Language, and Interpretation

The intersection of Russian phonological structure and vocal performance provides a framework for understanding how composers integrate music and text.[14] The choice of an original language text or a translation in the vocal oeuvre defines and influences the composer's treatment of text. The linguistic profile of the poetry outlines the composer's interpretation and stylistic approach. Such an influence translates into both phonetic accuracy and artistic expression. A significant emphasis exists on vowels and their functional roles, specifically their phonetic-acoustic resonance – which influences melodic contour – and their metric-prosodic functions, which dictate the rhythmic alignment of the vocal line. The research examined the evolution of language systems and defined the ways composers can navigate the articulatory base of the language grounded within the natural flow of speech and the presence of specific articulatory patterns. Regarding vocalism, singers have unique interpretations of how they perceive phonetic structures and identify the phonological methods for performing words in the Russian language – similar to how composers may integrate a particular compositional methodology into their phonological frameworks.

Acoustic metrics and language capacity are likewise ways that can demonstrate phonetic measurements. In recent academic literature, Bjorndahl

[13] Eryong Li, "On Dramaturgy of Russian Romance of S. V. Rachmaninov", *Rupkatha Journal of Interdisciplinary Studies in Humanities*, 13(1), 2021, 4.

[14] Veronika Bondareva, "Using the Phonological Approach to Describe the Vocal System of the Russian Language in the Context of Russian-Spanish Language Contact", *RUDN Journal of Language Studies, Semiotics and Semantics*, 12(4), 2021, 1270.

examined duration and harmonicity as means of distinguishing language capacities within vocalism.[15] The various acoustic sonorants can help understand the phonetic identity within each word and its artistic realization, which offers a performer a series of interpretative performance practices. Additionally, acoustic metrics can have a deeper connotation within a composer's artistic language, as certain composers can incorporate a particular stylistic approach based on the textual use of phonetics. By understanding the way phonetic measurements can be applied within the text, one can better analyze why certain composers prioritize certain vowels, particular lengths, and a certain level of consonance within the vowels to achieve desired artistic effects while controlling for musical tension.

3. Methodology

3.1. Summary

The corpus-based phonetic-musicological analysis was used to analyze four poems in Rimsky-Korsakov's Op. 2 cycle, comparing Russian-authored and German-authored works in the cycle based on sonority levels and thematics. The text of each poem was extracted using R and coded using Jamovi. Each poem's stanza was analyzed, distinguishing between the opening poetic stanza, the poetic development, and the concluding stanzas. Each stanza was divided into separate words. Each word was divided into syllables, with the stressed syllable being extracted for further analysis. A stressed vowel was then extracted from every stressed syllable in every poem. The 10 possible stressed vowels in the Russian language were divided into 3 sonority levels, with letters: (1) "у", "ю", "и", and "ы" belonging to the L_1 sonority; "о", "ё", "э", and "е" belonging to the L_2 sonority; (3) "а" and "я" belonging to the L_3 sonority. Combinations of sonorities were likewise examined based on patterns of two sequential sonority levels.

3.2. Visualizing the Distribution of Sonority Levels

Two types of tables were used to visualize sonority levels across the four poems: a frequency table and a contingency table. The combined table is shown in Appendix 1.

[15] Christina Bjorndahl, "Voicing and Frication at the Phonetics-Phonology Interface: An Acoustic Study of Greek, Serbian, Russian, and English," *Journal of Phonetics*, 92, 2022, Article 101136.

First, the frequency table was used to analyze the occurrence of every sonority level in Op. 2 Nos. 1-4. Specifically, the study examined the number of occurrences of $L_{1\text{-}3}$ within each word of the text. The frequency tables helped determine the phonetic color of each text. Within each poem, a summation of each occurrence of a sonority level was treated as a single data point. For instance, if a poem contained a total of 3 L_2 stressed vowels, the raw frequency for that stanza of L_2 sonority was "3".

Second, the contingency table was used to evaluate the two-patterned combinations of sonorities, analyzing the preceding sonority of every stressed vowel. While frequency tables showed the overall vowel palette, the contingency tables helped with cross-tabulation and were used to examine the relation between sonority levels and the formal structure of each poem. Such an approach allowed one to examine whether Rimsky-Korsakov's phonetic choices varied across the four songs. Each stressed syllable was mapped onto a sonority level and the preceding sonority level. Such an approach provides a theoretical framework for illustrating specific phonetic profiles in each of the four compositions. Simultaneously, it is important to recognize that baseline linguistic structures – such as vowel reduction, unstressed syllables, and consonants – can influence the broader phonetic strategy in the text.

3.3. Neighboring Sonority Patterns

Markov's transition matrix was then used to map the probability levels of every two patterns within each song. Appendix 2 shows Markov's transition matrix itself. This allows one to generate a phonetic map of musical expectations, illustrating how acoustic profiles align with poetic structure in the four songs. An examination of sequential sonority patterns helps identify vowel-leading combinations that Rimsky-Korsakov emphasized within his early-period compositional language, particularly in relation to the Op. 2 works. The study used a Markov transition matrix to map the horizontal movement between stressed vowels. While each stressed vowel is treated as a state, the study examined the text as a chronological chain of such states within a sequence. The study then tracked every instance within each song of where a specific sonority was followed by another sonority, creating a series of two components (current sonority level and previous sonority level) within each series. The study calculated every time the following occurred in every song: (1) an L_1 stayed at L_1, an L_1 moved to L_2, an L_1 moved to L_3; (2) an L_2 moved to L_1, an L_2 stayed at L_2, an L_2 moved to L_3; (3) an L_3 moved to L_1, an L_3 moved to L_2, an L_3 stayed at L_3. The probability ratio was calculated by divid-

ing the count of specific transitions by the total number of sonority sequence movements. These probabilities were plotted on a 3x3 matrix, creating a stochastic map of the poetry. From a musicological perspective, this helped reveal whether Rimsky-Korsakov emphasized the smooth phonetic contours within the integration of his compositional language within harmony and the vocalist's line.

The generalized linear model moves from descriptive findings to musical predictions and broader structural dependencies in Op. 2 songs. The generalized linear model was built to see if a particular song in Op. 2 could predict any specifics of Rimsky-Korsakov's compositional style and whether any sonority pattern was attributed to Rimsky-Korsakov's attempt to visualize a scenery or a meaning within a poem, as shown in Appendix 3. A generalized linear model examined whether Rimsky-Korsakov's choice of a specific song in the cycle emphasized a particular sonority profile of the text. The sonority level was the dependent variable, which was the variable that the study sought to explain. In the data, nationality, poet, stanza, stressed vowel, and previous sonority were predictors (also known as independent variables) that could have accounted for variation in the dependent variable. The factor in the generalized linear model is the song, meaning that the model calculates if shifting between any two songs in Op. 2 will result in statistically significant shifts in the vowels that Rimsky-Korsakov chose to emphasize in his music.

To compare sonority levels across songs and nationalities, the study first used a One-Way ANOVA (Analysis of Variance), with sonority level as the dependent variable and nationality as the independent variable. However, upon checking the statistical assumptions ($W = 0.894$, $p < .001$), the data proved unsuitable for this specific test. Therefore, the non-parametric Kruskal-Wallis test was used to show the analysis of variances, showing the pairwise comparisons between different sonority levels within each of the four songs, also seen in Appendix 3.

4. Analysis and results

4.1. Frequencies

The frequency table shows the sonority level of Op. 2 Nos. 1-4, specifically focusing on the number of occurrences in each of the three sonority levels in each word within stressed syllables, showing multiple hidden patterns.

First, separately, each song has a varied range of sonorities, with Op. 2 Nos. 1 and 4 ranges being more balanced (as seen in Op. 2 No. 1 with a range

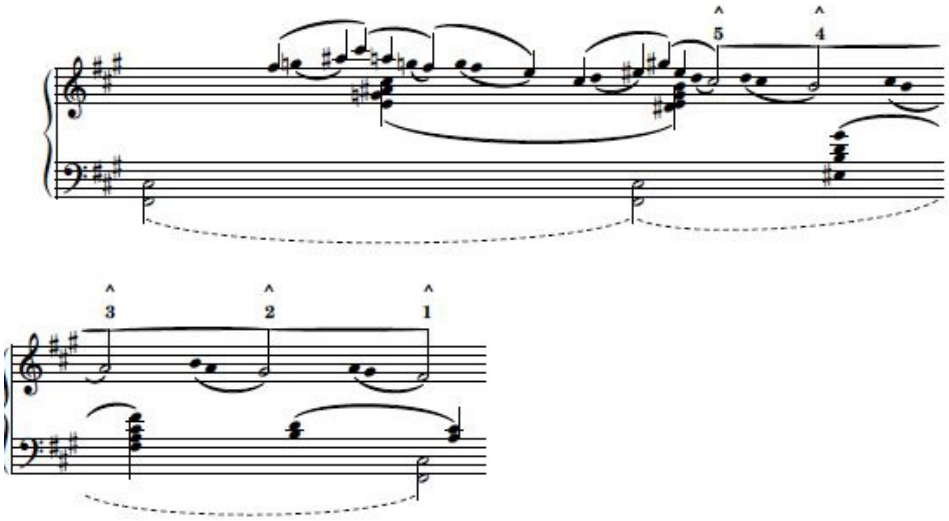
of 7 to 12 and Op. 2 No. 4 with a range of 5 to 11), and Op. 2 Nos. 2 and 3 sonority levels being more varied (as seen in Op. 2 No. 2 with a range of 5 to 23 and Op. 2 No. 3 with a range of 3 to 17). The German-authored and Russian-translated songs have more balanced frequencies of sonorities, especially among L_1 and L_2 levels (12 to 12 in Op. 2 No. 1 and 9 to 11 in Op. 2 No. 4). On the other hand, the German-authored and Russian-translated songs have a higher value of L_1 sonority (12 in Op. 2 No. 1 and 9 in Op. 2 No. 4), compared to Russian-authored texts (with 5 in Op. 2 No. 2 and 3 in Op. 2 No. 3). Phonetic constraints of translated Russian verse, based on original German meter and sentence structure, result in a more homogenous vowel color when compared to Russian poetry, showing a difference in how Rimsky-Korsakov approaches the melodic and harmonic construction of German and Russian poetry.

Op. 2 No. 2 heavily relies on L_2 sonority (19.5% of the entire total within the Op. 2). Op. 2 No. 2 is the song that is most associated with orientalism. Rimsky-Korsakov associates L_2 sonority levels with mid-bright timbral quality, which characterizes exoticism within orientalism while focusing on the melodic ornamentation. An example can be seen with the arabesque ornamented melodies that are used in the piano accompaniment to support the vocalist's line. The pianist's introduction prior to the vocalist's entrance shows such moments occurring in mm. 3, 5, 6, 7, and 8, using the thirty-second notes, as shown in Example 1.

Example 1: Rimsky-Korsakov's Op. 2 No. 2, mm. 1–10

The pianistic descent using the arabesque structures prepares the eventual entrance of the vocalist's line. Additionally, the Schenkerian representation of the pianist's introduction shows the descending V-I *Urlinie* with subordinary arabesque elements, initiated after the opening primary tone ^5 and continuing prior to each of the *Stufen* on the way to the tonic, as shown in Example 2.

Example 2: Rimsky-Korsakov's Op. 2 No. 2, mm. 1–9, Schenkerian graph



Rimsky-Korsakov freezes the harmonic movement through the expanded pedal point consisting of an F-sharp and C-sharp dyad in the pianist's left hand, creating a sense of timbral and echo-centered hovering. From a listener's perspective, such a structure allows one to focus on the arabesque ornamentations in the right hand while waiting for the initialization of the vocalist's melody.

By keeping the linear trajectory of the *Urlinie*, Rimsky-Korsakov affirms that the musical resonance contains depth, which lowers dissonance levels and prepares the support for the vocalist. This linear predictability in the piano accompaniment is two-fold: (1) to support the goal-oriented progression, and (2) to strengthen the general stability for the singer's solo part starting on the third beat of m. 13. The vocalist enters with a highly balanced phonetic profile. The text establishes eight distinct sonorities in the first phrase, initialized with an L_1. The opening sonority then resolves into a con-

secutive line of five L_2 sonorities. In total, the phrase contains a total of six L_2 sonorities in the opening vocalist's line, with a final cadence creating an L_2-L_3-L_2 pattern. The following phonetic trajectory – with its structural rise and resolution – reflects the resolving Urlinie in the pianist's accompaniment to start the romance.

Op. 2 No. 3 contains the highest ratio of L_3 (total of 8) to L_1 (total of 3) sonorities. This is an unexpected finding given that Op. 2 Op. 3 is a lullaby, and should contain more closed vowels. Rimsky-Korsakov uses resonance and depth to create a sense of peaceful atmosphere and tranquility in his lullaby despite the drastic change in sonority combinations. An example can be seen in mm. 1–13, a pianistic introduction, as shown in Example 3.

Example 3: Rimsky-Korsakov's Op. 2 No. 3, mm. 1–13

The continual outline of the D-flat major chord in the pianist's left hand produces the necessary peacefulness and tranquility characteristics of the lullaby.

Concomitantly, a scalar hidden stepwise ascending line in the piano accompaniment can be traced through the use of Schenkerian theory, starting on the F in m. 3 (III in D-flat major) while moving towards the I, the D-flat in m. 6. The Schenkerian representation of the passage can be seen in Example 4.

Example 4: Rimsky-Korsakov's Op. 2 No. 3, mm. 1–6, Schenkerian graph

An ascending line in the pianist's accompaniment from ^3 to ^8 in mm. 3–7 is unanticipated for a lullaby, yet it is paralleled by the vocalist's sonority patterns, as the passage starts with a consecutive set of four L_3 sonorities. On the contrary, the resolution reveals an L_3-L_2-L_1 passage when cadencing in mm. 6–7 on the extended A-flat.

4.2. Contingencies

The contingency table shows the two-pattern interactions between every set of two neighboring sonorities. The findings show a lack of a significant relationship or pattern between two neighboring sonority levels (based on p = 0.224). This shows that the poetry that was chosen for the songs by Rimsky-Korsakov does not follow any specific pattern of phonetic progression. However, patterns exist in each separate song of Op. 2, as Rimsky-Korsakov emphasizes the semantic meaning rather than the thematic meaning of word combinations throughout the cycle. This means that Rimsky-Korsakov focuses on word-specific prosody rather than a cycle-wide overall phonetic structure.

For example, a resolution into L_2 is clearly the most common in Op. 2 (with 61 in total) out of 114, with an L_2 going to L_2 having the most occurrences (34 in total). Rimsky-Korsakov chose to focus his compositional technique on the most common mid-range sonority level (L_2) with occasional apogees (L_1) or descents (L_3) that are represented throughout different techniques between the integration of music and text. Also, a resolution into L_3 is

the least common (with a total of only 25 out of 114) while an L_1-to-L_1 pattern and an L_1-to-L_3 pattern are the rarest in the Op. 2 cycle (with 5 of each, respectively). More particularly, a resolution into L_3 and the development and extension of the L_3 vowels require increased durations for melodies.

4.3. Markov's Matrix

Markov's matrix shows the probability statistics based on sonorities found in the four songs. Given the current sonority level within each work, Markov's matrix showed probabilities that Rimsky-Korsakov would choose a particular sonority at L_1, L_2, or L_3. Three key observations can be made based on Markov's transition matrix.

First, there is an emphasis by Rimsky-Korsakov on L_2 sonority, while the L_1 and L_3 have a general pull towards L_2 across the entire Op. 2 cycle. For the most part, the poetry is balanced, and poets avoid extreme sonority movements, such as L_1 to L_3 (the probability at 25%) and L_3 to L_1 (the probability at 20%). Within that, Rimsky-Korsakov's music focuses on steady-state sonorities throughout Op. 2, with the composer not altering the musical climate and compositional style throughout the four songs, using a conservative vocal range within Op. 2. This can also be seen within the musical range of each song within the vocalist's line.

Second, in the poem's text, between transitions among identical sonorities, it is more likely to observe an L_3 to L_3 as seen based on 36% (the most dramatic and bright mood between sonorities) as opposed to L_1 to L_1, based on 17.86% (generating the gloomy and dark mood within the harmony). This is a significant finding that represents a greater chance of artistic brightness than gloominess, depending on the integration of music and text.

Third, for overall sonority, L_1 (occurring at 22.46%) and L_3 (occurring at 25.25%) are balanced, opening more opportunities for Rimsky-Korsakov to focus on L_2 sonorities (52.29%). This creates a well-adjusted phonetic architecture, which is backed up by the integration of vocalism and pianistic accompaniment within Rimsky-Korsakov's compositional style.

4.4. Generalized Linear Model

Based on the p-value of .174, the generalized linear model showed that there is only 4% of the variation in sonority that can be explained by the specific song number. This means that no particular sonority signature exists that was used by Rimsky-Korsakov in any separate songs. One other key observa-

tion exists based on the generalized linear model. Based on the p-value of .058, there is a statistical significance and difference in the sonority levels between Op. 2 No. 1 and Op. 2 No. 3. More specifically, the third song (the lullaby) has a higher average sonority (and more open Lv3 vowels) compared to Op. 2 No. 1, based on a calculated estimate of 0.33986. Also, based on $exp(B) = 1.40$, it is evident that a word in Op. 2 No. 3 is 1.4 times more likely to have a higher sonority level than a word in Op. 2 No. 1. With "0" being the baseline, and $exp(B) = 1.00$ representing a negative relationship, a positive estimate shows higher (brighter) average sonorities on a scale of 1 to 3. Therefore, two interpretations can be made here. First, there is no global difference in vowel brightness across the four songs. Second, while other data showed individual shifts in how music and text are treated by Rimsky-Korsakov, the generalized linear model showed that there was no major stylistic shift within Op. 2. The exception happened in the stylistic features of Op. 2 Nos. 1 and 3. While stylistic shifts exist in both songs, such shifts are too small and likely occur due to how Rimsky-Korsakov approached the meaning of poetry and what kind of harmony and melody he used within his compositional techniques.

4.5. Analysis of Variance

A statistical significance within the sonority levels based on the nationality variable exists ($p = .039$). However, the effect of this statistical significance is minimal (.036). The results indicate that the sonority mean of 1.84 for German-authored and Russian-translated songs within the 56 sonorities is significantly lower than the mean of 2.10 for Russian-authored songs within the 62 sonorities. A significant difference in sonority levels exists between the Russian-authored and German-authored and Russian-translated texts across the four songs.

These results suggest that there is a measurable phonetic shift in the reverberation of the text when Rimsky-Korsakov moves between local Russian poetry and German-translated works in the Op. 2 cycle. Poetically speaking, the German-authored texts (even when translated to Russian) are not approached the same way as the native Russian poems are. Musically speaking, Russian-authored texts, with a mean of 2.10, represent a brighter, more open phonetic profile, suggesting Rimsky-Korsakov's approach to a more resonant and exclamatory musical depiction of the textual foundation. On the contrary, German-authored Russian-translated poems, with a mean of 1.84, showcase a darker, more closed contour, favoring emphasis on L_1 and L_2 so-

norities, meaning that Rimsky-Korsakov was working with vocalism suitable for lower sonority levels.

5. Conclusion

The contrast between sonority levels in the Heine text and Mikhailov's translations is evident compared to Russian-authored poetry, creating an imbalance in the usage of vowels in the text. Translations change the phonetic peaks of the original language in Op. 2 romances, and Rimsky-Korsakov responds to this by using more standardized and predictable harmonic structures for the songs by Heine. For Russian poetry, Rimsky-Korsakov utilized a higher level of chromaticism and orientalism, as more focus is shown on L_2.

Furthermore, L_2 can be thought of as a phonetic tonic within the text, tantamount to having the tonic in Rimsky-Korsakov's harmonic analysis. In terms of phonetic hierarchy, L_1 (higher discord) and L_3 (lower discord) can be thought of as dissonances that eventually require stable resolution to L_2. Poetically speaking, there is a high probability of return to L_2, regardless of the starting point – similar to how there exists a continual pull towards the tonic in Rimsky-Korsakov's compositional language in the Op. 2 romances. The use of L_3 in a lullaby (Op. 2 No. 3) is unexpected and shows Rimsky-Korsakov's approach to compositional nonconformity – an interesting point worthy of further analysis in his early-style compositional writing. Within Op. 2 No. 3, Rimsky-Korsakov chooses to utilize deep resonances of L_3 vowels to outline the stability. The transition probabilities are defined by the semantic meaning of the word, and Rimsky-Korsakov's compositional goal is to characterize such words through the four romances and align harmonies to support the vocalist in their interpretation of every work within the song cycle.

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Appendix 1

Frequencies of songs			
Song	**L_1 count: % of total**	**L_2 count: % of total**	**L_3 count: % of total**
Op. 2 No. 1	L_1(12): 10.2%	L_2(12): 10.2%	L_3(7): 5.9%
Op. 2 No. 2	L_1(5): 4.2%	L_2(23): 19.5%	L_3(6): 5.1%
Op. 2 No. 3	L_1(3): 2.5%	L_2(17): 14.4%	L_3(8): 6.8%
Op. 2 No. 4	L_1(9): 7.6%	L_2(11): 9.3%	L_3(5): 4.2%

Contingency table				
Previous Sonority	**L_1**	**L_2**	**L_3**	**Total**
1	5	16	7	28
2	18	34	9	61
3	5	11	9	25
Total	28	61	25	114

Appendix 2

Markov's transition probability matrix			
	1	**2**	**3**
L_1	0.1786	0.5714	0.25
L_2	0.2951	0.5574	0.1475
L_3	0.20	0.4400	0.36

Overall sonority distribution: $L_1 = 0.2246$; $L_2 = 0.5229$; $L_3 = 0.2525$.

Appendix 3

Effect	Estimate	*SE*	*exp*(*B*)	*p*		Kruskal-Wallis				
Intercept	1.97167	0.0630	7.18	< .001			χ^2	*df*	*p*	ε^2
2 - 1	0.19070	0.1687	1.21	0.261		Sonority Level	4.28	1	0.039	0.036
3 - 1	0.33986	0.1771	1.40	0.058						
4 - 1	0.00129	0.1826	1.00	0.994						

Summary

Nikolai Rimsky-Korsakov's Op. 2 (1866) is a set of four romances based on Russian and foreign poetry. Defining his early style and revealing compositional approaches, the four works clarify the composer's construal of music and text. While the poetry by Aleksey Koltsov, Lev Mey, and Heinrich Heine (with Mikhail Mikhaylov's translations) offer an interesting performative intersection with Rimsky-Korsakov's use of pianistic accompaniment and vocalist's melody, the Op. 2 romances are relatively unexplored within theoretical frameworks of musicological scholarly literature. The following corpus-based phonetic-musicological study examines the emphasis on stressed vowels and sonorities in poetic words to understand Rimsky-Korsakov's compositional style, based on selected words from the romances' lyrics. The mixed-method design – employing quantitative, qualitative, and theory-centered techniques – helps disclose the composer's musical alignment with poets' creative narratives and intentions.

The use of contingency tables and Markov Transition Matrices yields empirical results and musical interpretations. Concomitantly, Schenkerian analysis supports and justifies Rimsky-Korsakov's compositional choices based on select examples. The study finds an integral phonetic and sonority-centered imbalance in poetry depending on whether the music is set to original Russian poetry or original German poetry translated to Russian. A significant finding within the research is the identification of the L_2 sonorities in words that utilize Russian letters "o", "ë", "э", and "e". Based on the findings, the study shows that a high probability of return to L_2 sonority occurs in the Op. 2 cycle, which mirrors the continual pull towards the harmonic tonic. Finally, the research highlights a compositional nonconformity in Op. 2 No. 3, where Rimsky-Korsakov's unexpected use of L3 sonority shows the composer's willingness to utilize deep resonances to outline artistic stability. Schenkerian analysis is used to reinforce the phonetic instances outlined in the music by showing harmonic interactions between the pianist's accompaniment and the vocalist's melody. The neighboring sonority sequences help characterize the phonetic-structural features of each poem, which are often left unexamined in traditional musicological and theoretical analyses.