RHYTHMIC VARIABILITY IN LANGUAGE AND MUSIC OF Latino
AND LATINO-INSPIRED COMPOSERS

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RECENTLY, RESEARCHERS HAVE INVESTIGATED THE
influence of composers’ native speech prosody on the
variability of rhythmic patterns found in their music.
The normalized pairwise variability index (nPVI) pro-
vides a relative criterion for comparing the contrastive-
ness of successive durations in language and music. This
study extends prior research by assessing rhythmic rela-
tionships in Latino-inspired and traditional Western art
music written by six composers whose native languages
are either stress-timed (Copland, Glinka, Liszt) or
syllable-timed (Ponce, Villa-Lobos, Albéniz). After anal-
ysis of 529 musical themes representing 52 works,
results suggest that Latino and Western prosodic asso-
ciations transcend the vernacular. With the exception of
Glinka, non-Latino composers typically used more con-
trastive rhythmic patterns in their standard repertoire
and drastically decreased rhythmic contrastiveness in
their evocative Latino music. Similarly, Latino compo-
sers employed greater rhythmic contrast in their
Western-styled works and less contrast in their vernac-
ular Latino music. This empirical evidence indicates
that, consciously or subconsciously, composers may
alter the rhythmic variability of their “exotic” music to
conform to the prosody of a corresponding nonnative
language.

Received: May 24, 2016, accepted August 16, 2016.

Key words: speech rhythm, musical rhythm, nPVI,
Latino, prosody

LATINO AND HISPANIC AESTHETICS have
inspired generations of artists, especially musi-
cians. From roughly 1850 to 1950, Latino nation-
ist composers produced evocative works to celebrate
the heritage and unique cultural contributions of their
countries. Examples include Manuel de Falla’s piano
suite Cuatro piezas españolas (1908) and Carlos
Chávez’s ballet El fuego nuevo (1921). Composers in
other areas of the world borrowed from Latino tradition
toimmer their audiences in the exotic flavors of far-
off lands. Successful works written in this vein include
Rimsky-Korsakov’s Capriccio Espagnole (1887) and,
perhaps the most famous example, Bizet’s opera Car-
men (1875). Although Latin flavor might be imparted
through the manipulation of melody, timbre, or form,
rhythm serves as the essential ingredient. In their works,
Non-Latino composers seeking a Latino sound empha-
sized idiomatic rhythms such as syncopation and hemi-
ola indicative of huapango or danzón style. Regarding
another prominent example, Copland’s El Salón México
(1936), Murchison (2012) observes the following: “No
doubt, Copland was attracted to Mexican folk music
partly because of (ostinato) rhythms, which strongly
resemble the additive rhythms of jazz and the shifting
meters of Stravinsky” (pp. 202-203).

An old musicological adage suggests that perceptible
similarities exist between a composer’s native language
and structural aspects of his or her music (Abraham,
1974). Patel and Daniele (2003) tested this assertion by
applying a measure of intervocalic contrastiveness, the
normalized pairwise variability index (nPVI), to music.
The nPVI (Grabe & Low, 2002) gauges the variability of
successive vowel durations; a normalization procedure
accounts for fluctuations in speaking rate/tempo. The
resulting index indicates the amount of durational var-
iability within utterances or musical passages. Lan-
guages with lower nPVI levels exhibit more uniform
vowel durations; historically, these have been labeled
“syllable-timed” languages because of uniformity in
durations between syllable onsets. Examples of
syllable-timed languages include Spanish, French, and
Italian. Higher nPVI languages tend to contain a higher
level of vowel reduction, and are dubbed “stress-timed”
since only the stressed syllables are spoken at regular
intervals. English, German, and Russian are a few exam-
plesof stress-timed languages. After using the nPVI to
assess durational differences in British and French instru-
mental music, Patel and Daniele discovered significant
differences in the same direction as the stress-timed/
syllable-timed language continuum. That is, British
music produced higher nPVIs, and French music scored
lower.

Researchers have demonstrated increasing interest in
exploring the language-music connection via the nPVI.
Huron and Ollen (2003) extended the work of Patel and Daniele by including composers from other countries besides France and Great Britain, and successfully replicated Patel and Daniele’s findings within this expanded international corpus. Numerous scholarly tangents developed out of this early musical nPVI research, including incorporation of the pitch domain (Patel, Iversen, & Rosenberg, 2006), comparison of within-language dialects (McGowan & Levitt, 2011), and forays into popular music (Sadakata, Desain, Honing, Patel, & Iversen, 2004), art song (VanHandel & Song, 2010), and folk and children’s music (Hannon, Lévêque, Nave, & Trehub, 2016). Researchers have also studied listener perceptions of pairwise rhythmic variability (Hannon, 2009), linguistic foundations of idiom-atic rhythmic figures (Temperley & Temperley, 2011), refinements to nPVI analysis procedures (London & Jones, 2011), emotional communication via rhythmic contrast (Poon & Schutz, 2015; Quinto, Thompson, & Keating, 2013), as well as nPVI assessment of recorded performances (Raju, Asu, & Ross, 2010) and historical trends (Daniele & Patel, 2013, 2015; Hansen, Sadakata, & Pearce, 2016). Taken together, findings from these studies strongly suggest a consistent association between the contrastiveness of melodic rhythm and speech prosody in the works of composers hailing from various nations.

Further exploration of rhythm-language connections will assist in determining whether these observed effects hold true in additional nationalities and dialects, and if composers alter the rhythmic contrastiveness of “exotic” music to conform to the prosody of a corresponding nonnative language. In the present study, I aim to enhance understanding of musical-linguistic phenomena (a) in the context of the Spanish language, one of the most widely-spoken in the world, and (b) as a function of inspiration, when composers, consciously or subconsciously, play with what might be considered musical affectations. Thus, the purpose of this study was to determine the effect of vernacular language on Latino and Latino-inspired composers’ manipulation of rhythm. I tested the following hypotheses:

H1: Latino-inspired musical themes will feature significantly lower rhythmic contrastiveness regardless of the vernacular language of the composer.

H2: Western-inspired musical themes will feature significantly higher rhythmic contrastiveness regardless of the vernacular language of the composer.

**Method**

Two types of composer created the music examined in this study: (a) those of Latino heritage who wrote in both nationalistic and Western styles, and (b) those from non-Latino countries who wrote a significant number of Latino-inspired works alongside traditional (Western) repertoire. I used the terms “Latino” and “Western” to denote compositions written in a composer’s vernacular style, and “Latino-inspired” and “Western-inspired” to designate compositions influenced by a nonnative tradition. Favoring depth over breadth, I chose to analyze the musical themes of six exemplar composers: Aaron Copland (USA), Mikhail Glinka (Russia), Franz Liszt (Hungary), Manuel Ponce (Mexico), Heitor Villa-Lobos (Brazil), and Isaac Albéniz (Spain). Copland, Glinka, and Liszt wrote a substantial amount Latino-inspired instrumental music, yet grew up speaking stress-timed (high-nPVI) native languages.¹ Ponce, Villa-Lobos, and Albéniz represent a range of Spanish-speaking countries and generated both works evocative of their homelands and more Western-styled absolute music. While additional composers might have met these inclusion criteria, I also considered musical era, eminence, and the accessibility of repertoire when choosing the final group of six. My primary analyses compared themes within each composer’s body of repertoire, not across the six composers’ repertories. Thus, conclusions drawn from this study are limited to the stylistic variation of each composer under examination and do not connote more widespread or comprehensive relationships between music and language.

As with previous nPVI studies of this nature (e.g., Daniele & Patel, 2013; Huron & Ollen, 2003; Patel & Daniele, 2003), I delimited the data corpus to instrumental music exclusively. Barlow and Morgenstern’s A Dictionary of Musical Themes (1948/1983) served as a starting place for obtaining instrumental themes for analysis, but due to a general lack of Latino music within it, I supplemented with themes found in other digital and print repositories. This process resulted in a final collection of repertoire that accounts for nearly every evocative Latino-inspired work within each composer’s catalog. Often, the title of a work indicated its inspiration, as with Copland’s *El Salón México* and Albéniz’s *España*; in other cases, I engaged in musicological research to investigate the composer’s intent. I then balanced the collection with the same number of

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¹ Liszt grew up in present day Austria and spoke German, not Hungarian.
musical themes from Western-inspired works of similar publication year and instrumentation. Therefore, this purposive sample does not comprise the entirety of each composer’s instrumental repertoire; I focused on unambiguously emblematic Latino and Latino-inspired music.

I defined a theme as a reoccurring melody of at least 12 notes encompassing the majority of a phrase’s length, often marked by privileged placement within the context of the piece and variation or embellishment. When transcribing from scores, I used each theme’s first iteration. To be included, a musical work required at least

<table>
<thead>
<tr>
<th>Composer</th>
<th>Inspiration</th>
<th># of Themes</th>
<th>Source Works</th>
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<tbody>
<tr>
<td>Aaron Copland (USA) (1900-1990)</td>
<td>Latino</td>
<td>30</td>
<td>El Salón México, Danzón Cubano, Three Latin American Sketches, Symphony no. 2, Billy the Kid, Appalachian Spring, Concierto for Piano and Orchestra, Jota Aragonesa, Souvenir d’une nuit d’été à Madrid, Las Mollares (Danza Andaluza), Kamarinskaya, Tarantella on a Russian Folk Song, Symphony on Two Russian Themes, Overture ‘A Life for the Tsar’, Rhapsodie espagnol, La romanescă, Große Konzertfantasie über spanische Weisen, Rondeau fantastique sur un theme espagnol, Hungarian Rhapsodies nos. 1, 10, 14, Sonata in B Minor, Grande galop chromatique, Intermezzi nos. 1-3, String Trio, Mazurka no. 1 in F Minor, Prelude in E Major, Estampas Nocturnas, Balada Mexicana, Cuatro Danzas Mexicanas, Rapsodia Mexicana no. 2, Piano Concerto no. 1, String Quartets nos. 5, 6, Bachianas Brasileiras, Quartet for Flute, Oboe, Clarinet, and Bassoon, Ciclo Brasileiro, Chôros, Guita práctico, A Prole do bebê, Piano Sonatas nos. 3, 4, 5, Concierto fantástico, Les saisons, Doce Piezas Características, Iberia, Suite española, España, Alhambra suite</td>
</tr>
<tr>
<td>Mikhail Glinka (Russia) (1804-1857)</td>
<td>Latino</td>
<td>31</td>
<td>Souvenir d’une nuit d’été à Madrid, Las Mollares (Danza Andaluza), Kamarinskaya, Tarantella on a Russian Folk Song, Symphony on Two Russian Themes, Overture ‘A Life for the Tsar’, Rhapsodie espagnol, Große Konzertfantasie über spanische Weisen, Rondeau fantastique sur un theme espagnol, Hungarian Rhapsodies nos. 1, 10, 14, Sonata in B Minor, Grande galop chromatique, Intermezzi nos. 1-3, String Trio, Mazurka no. 1 in F Minor, Prelude in E Major, Estampas Nocturnas, Balada Mexicana, Cuatro Danzas Mexicanas, Rapsodia Mexicana no. 2, Piano Concerto no. 1, String Quartets nos. 5, 6, Bachianas Brasileiras, Quartet for Flute, Oboe, Clarinet, and Bassoon, Ciclo Brasileiro, Chôros, Guita práctico, A Prole do bebê, Piano Sonatas nos. 3, 4, 5, Concierto fantástico, Les saisons, Doce Piezas Características, Iberia, Suite española, España, Alhambra suite</td>
</tr>
<tr>
<td>Franz Liszt (Hungary) (1811-1886)</td>
<td>Latino</td>
<td>33</td>
<td>Große Konzertfantasie über spanische Weisen, Rondeau fantastique sur un theme espagnol, Hungarian Rhapsodies nos. 1, 10, 14, Sonata in B Minor, Grande galop chromatique, Intermezzi nos. 1-3, String Trio, Mazurka no. 1 in F Minor, Prelude in E Major, Estampas Nocturnas, Balada Mexicana, Cuatro Danzas Mexicanas, Rapsodia Mexicana no. 2, Piano Concerto no. 1, String Quartets nos. 5, 6, Bachianas Brasileiras, Quartet for Flute, Oboe, Clarinet, and Bassoon, Ciclo Brasileiro, Chôros, Guita práctico, A Prole do bebê, Piano Sonatas nos. 3, 4, 5, Concierto fantástico, Les saisons, Doce Piezas Características, Iberia, Suite española, España, Alhambra suite</td>
</tr>
<tr>
<td>Manuel Ponce (Mexico) (1882-1948)</td>
<td>Western</td>
<td>31</td>
<td>Jota Aragonesa, Souvenir d’une nuit d’été à Madrid, Las Mollares (Danza Andaluza), Kamarinskaya, Tarantella on a Russian Folk Song, Symphony on Two Russian Themes, Overture ‘A Life for the Tsar’, Rhapsodie espagnol, Große Konzertfantasie über spanische Weisen, Rondeau fantastique sur un theme espagnol, Hungarian Rhapsodies nos. 1, 10, 14, Sonata in B Minor, Grande galop chromatique, Intermezzi nos. 1-3, String Trio, Mazurka no. 1 in F Minor, Prelude in E Major, Estampas Nocturnas, Balada Mexicana, Cuatro Danzas Mexicanas, Rapsodia Mexicana no. 2, Piano Concerto no. 1, String Quartets nos. 5, 6, Bachianas Brasileiras, Quartet for Flute, Oboe, Clarinet, and Bassoon, Ciclo Brasileiro, Chôros, Guita práctico, A Prole do bebê, Piano Sonatas nos. 3, 4, 5, Concierto fantástico, Les saisons, Doce Piezas Características, Iberia, Suite española, España, Alhambra suite</td>
</tr>
<tr>
<td>Heitor Villa-Lobos (Brazil) (1887-1959)</td>
<td>Western</td>
<td>53</td>
<td>Jota Aragonesa, Souvenir d’une nuit d’été à Madrid, Las Mollares (Danza Andaluza), Kamarinskaya, Tarantella on a Russian Folk Song, Symphony on Two Russian Themes, Overture ‘A Life for the Tsar’, Rhapsodie espagnol, Große Konzertfantasie über spanische Weisen, Rondeau fantastique sur un theme espagnol, Hungarian Rhapsodies nos. 1, 10, 14, Sonata in B Minor, Grande galop chromatique, Intermezzi nos. 1-3, String Trio, Mazurka no. 1 in F Minor, Prelude in E Major, Estampas Nocturnas, Balada Mexicana, Cuatro Danzas Mexicanas, Rapsodia Mexicana no. 2, Piano Concerto no. 1, String Quartets nos. 5, 6, Bachianas Brasileiras, Quartet for Flute, Oboe, Clarinet, and Bassoon, Ciclo Brasileiro, Chôros, Guita práctico, A Prole do bebê, Piano Sonatas nos. 3, 4, 5, Concierto fantástico, Les saisons, Doce Piezas Características, Iberia, Suite española, España, Alhambra suite</td>
</tr>
<tr>
<td>Issac Albéniz (Spain) (1860-1909)</td>
<td>Western</td>
<td>85</td>
<td>Jota Aragonesa, Souvenir d’une nuit d’été à Madrid, Las Mollares (Danza Andaluza), Kamarinskaya, Tarantella on a Russian Folk Song, Symphony on Two Russian Themes, Overture ‘A Life for the Tsar’, Rhapsodie espagnol, Große Konzertfantasie über spanische Weisen, Rondeau fantastique sur un theme espagnol, Hungarian Rhapsodies nos. 1, 10, 14, Sonata in B Minor, Grande galop chromatique, Intermezzi nos. 1-3, String Trio, Mazurka no. 1 in F Minor, Prelude in E Major, Estampas Nocturnas, Balada Mexicana, Cuatro Danzas Mexicanas, Rapsodia Mexicana no. 2, Piano Concerto no. 1, String Quartets nos. 5, 6, Bachianas Brasileiras, Quartet for Flute, Oboe, Clarinet, and Bassoon, Ciclo Brasileiro, Chôros, Guita práctico, A Prole do bebê, Piano Sonatas nos. 3, 4, 5, Concierto fantástico, Les saisons, Doce Piezas Características, Iberia, Suite española, España, Alhambra suite</td>
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TABLE 1. Composers and works examined in this study
30 themes. I made no provisions for grace notes or fermatas, as none appeared in any of the themes I examined. Since the final duration of many themes tends to be uncharacteristically long, I omitted the last note of every theme to avoid skewing nPVI calculations. Rests, while rare, presented a conundrum—do I simply omit a rest, or include it in the durational value of the note preceding it? I chose the latter approach with the belief that, rhythmically, the listener’s ear does not perceive an eighth note-eighth rest combination in the same manner as a pair of eighth notes. I collected a total of 529 themes representing 52 works (see Table 1). I coded themes by hand using relative numbers to represent durational value; i.e., a quarter note equaled 1, an eighth note equaled .5, and a half note equaled 2. I entered each theme’s string of numbers into the nPVI equation and used the resulting scores to calculate median nPVIs for each composer’s representative collection of vernacular and inspired works. Finally, as with past musical nPVI studies (Patel & Daniele, 2003; VanHandel & Song, 2010), I conducted analyses to detect the effects of meter on rhythmic variation. I found no significant differences (\( p > .05 \)) among the nPVI levels of themes written in simple versus compound meter.

### Results

Table 2 displays nPVI data by composer. Figure 1 provides a graphic representation of the magnitude of nPVI differences between the vernacular and inspired works of each composer. Due to nonnormal distribution of data and the presence of outliers, I employed nonparametric statistical tests via SPSS. This approach aligns with data treatment procedures from previous nPVI studies in music (Huron & Ollen, 2003; Patel & Daniele, 2003; Patel et al., 2006).

The median nPVI of Western themes was significantly higher for Copland (\( U = 673.0, p = .003, r = .37 \)), Liszt (\( U = 865.0, p < .001, r = .47 \)), Ponce (\( U = 780.0, p < .001, r = .49 \)), Villa-Lobos (\( U = 2,021.5, p = .001, r = .31 \)), and Albéniz (\( U = 4,984.0, p < .001, r = .34 \)). These differences correspond directionally to nPVI disparity in stress-syllable-timed speech rhythm. The most robust effect sizes occurred in the music of Ponce and Liszt. Glinka’s music, the lone aberration, did not differ significantly when grouped by inspiration (\( U = 449.0, p = .80 \)). In fact, the median nPVI of his Latino themes rated slightly higher than that of his Western-inspired themes. Generally, these results support the assertion that, in common practice era instrumental music, vernacular melodic rhythm mimics vernacular speech prosody. Further, with the exception of Glinka, the composers I examined appeared to imbue their exotic-inspired works with a rhythmic “accent” that conformed to the speech prosody of the nonnative cultures they sought to represent through music. Thus, these results support both of my hypotheses.

### Discussion

This study augments previous research findings by demonstrating that rhythmic variability characteristics of spoken Spanish appear to match those of Latino-inspired music. Non-Latino composers typically used more contrastive rhythmic patterns in their standard repertoire and drastically decreased rhythmic variability in their evocative Latino music. Similarly, Latino composers employed greater rhythmic contrast in their Western-styled works and less contrast in their vernacular Latino music. The five composers manifesting this phenomenon might have consciously switched their compositional approaches to achieve more or less
rhythmic contrast, perhaps due to influential teachers, insight gleaned through travel, or other explanations. Or, in keeping with Patel et al.’s “direct route” hypothesis (2006), these composers might have drawn upon implicit prosodic knowledge to tailor musical patterns subconsciously to reflect native or nonnative cultures.

Glinka’s music did not display the strong prosodic associations found in the music of the other five composers. In fact, Glinka’s Latino themes featured more rhythmic contrast than his native Russian themes, although not at a statistically significant level. To speculate briefly as to why the pattern did not continue with Glinka, consider his unusual musical experiences as a child. He grew up under the care of his grandmother, who apparently limited his musical exposure to peasant folk singing and occasional church songs (Campbell, 2016). Later, he received an elite education as a child of the aristocracy and may have learned multiple languages and/or musical traditions, especially low-nPVI French. In fact, Catherinian Era education in Russia emphasized French language and culture to such an extent that, according to Daniele and Patel (2013),
Francophilia may explain why Russian music features the low nPVI levels of French despite spoken Russian’s higher relative contrastiveness. Other scholars (Lamas, 2003; Parakilas, 1998) argue that Glinka’s Spanish-themed music lacks a marked compositional departure from his vernacular Russian style, although Hess (2001) described how some Spaniards considered Glinka’s music to be “...the essence of ‘Spanishness’” (p. 3). It could be that Glinka sought to demonstrate how Spanish music, or at least its spirit, could be assimilated into Western common practice style without inflecting core Western elements such as rhythm.

Daniele and Patel (2004, 2013, 2015) traced nPVI fluctuations across the common practice period and discovered associations between rhythmic variability and trends in compositional style. For instance, they attributed the consistent rise in nPVI levels of German/Austrian works between 1600 and 1900 to the waning influence of the less contrastive Italian style, which had been in vogue at earlier points in time. Although alternative explanations for these climbing nPVI levels (VanHandel, 2016) run counter to Daniele and Patel’s theory of Italian influence, I thought it prudent to search for similar historical associations. Figures 2–5 display the results of regression analyses for the four thematic groupings featured in this study (Latino, Latino-inspired, Western, Western-inspired). The nearly flat regression lines suggest that date of composition had little effect on the rhythmic variability of the themes I examined.

In future studies, researchers could assess durational differences among the various dialects of Spanish to determine the extent to which discrepancies associate with music from corresponding regions. The nPVI could also be used to assess other examples of musical exoticism, such as Western composers’ borrowing of Middle Eastern or Asian styles. In addition, researchers might perform targeted historical research (see Daniele & Patel, 2015) across a single Latino or Latino-inspired composer’s lifetime to trace nPVI fluctuation in various career stages, and how this relates to use of exoticism or other forms of inspiration. Development of the phrase-nPVI (VanHandel & Song, 2010) and nonlinear analytical procedures (Hansen et al., 2016) enables future researchers to conduct broader analyses of cultural prosodic borrowing within and across other music formats, especially vocal repertoire. Finally, additional investigations of within-category nPVI variability around a median would prove informative. As shown in Figure 1, results of the present study revealed a much narrower range of rhythmic patterns in Latino-inspired music, especially when written by non-Latino composers (e.g., Copland and Liszt, whose Latino-inspired nPVI distributions were less than half as diffuse as their native nPVI distributions). Future research could help determine the source of this disparity—perhaps a correlation with tempo, or non-Latino composers’ use of stereotypical rhythmic idioms that verge on inauthentic in uniformity and redundancy.

This investigation contributes evidence to support the theory that rhythms employed by composers reflect their native language. Furthermore, as if assuming a foreign accent or affectation, the majority of composers profiled herein seemingly altered their treatment of rhythm to reflect the prosody of a corresponding non-native language. Findings, while limited to a sample of six exemplars, suggest that Latino and Western prosodic associations transcend the vernacular, remaining remarkably consistent regardless of composer heritage.

Author Note

The author would like to thank research assistants Benjamin Icenogle and Chelsea Hudson for their help with data collection and coding.

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