
Notes & Comment

Agogic Contrast in French and English Themes: Further Support for Patel and Daniele (2003)

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A. D. Patel and J. R. Daniele (2003) compared the rhythms of musical themes written by French and English composers. They found a significant difference that mirrors known prosodic differences in French and English speech. Specifically, Patel and Daniele found the note-to-note durational contrast to be higher in English music than in French music. Their study was based on 137 English themes and 181 French themes that were selected according to stringent criteria. Here we report a replication of Patel and Daniele with a greatly expanded sample of nearly 2000 themes.

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MUSICOLOGISTS have long conjectured that the language of a culture influences the music of that culture. Pertinent observations have been largely anecdotal, and few empirical studies have been carried out. A recent exception is a study by Patel and Daniele (2003) that focused on a well-known difference between English and French prosody. In simple terms, spoken English has a tendency to exhibit a high contrast in durational or agogic values between successive syllables, whereas spoken French typically shows much less contrast.

Patel and Daniele set out to determine whether evidence of this linguistic difference is present in musical themes from English and French works. They focused on the relative contrast in duration between successive notes. If English music is similar to English prosody, one might predict that the durations of successive notes would tend to exhibit a greater contrast than

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is the case for French music. This prediction was borne out in their study. In quantifying the agogic or durational contrast, Patel and Daniele used the normalized pairwise variability index (nPVI) devised by Low, Grabe, and Nolan (2000). High nPVI values indicate comparatively large durational contrasts between successive notes or syllables. When successive syllables or notes are similar in duration, the nPVI value will be lower.

In selecting the materials for their study, a number of sampling criteria were adopted. Because composers often create music to fit some pre-existing text, it would not be surprising to discover that vocal music reflects the prosodic features characteristic of the language used. Consequently, Patel and Daniele explicitly excluded vocal works from their sample.

Historically, music has often been influenced by a dominant national fashion. For example, at different periods in history, Italian music was emulated by composers of many different nationalities. In order to avoid a potential confound, Patel and Daniele focused on a historical period that has been characterized by musicologists as one of great nationalism in music. They specifically chose composers who were active in the late 19th century and early 20th century.

A number of other sampling criteria were also used in their study. They selected only composers who were native speakers of British English or continental French. Instrumental works whose titles suggest a vocal origin or conception were eliminated. Also eliminated were works belonging to marked rhythmic genres—most notably dances (e.g., waltzes, giges, gavottes, and marches). Works intended for children or “exotic” works that endeavored to emulate, parody, or imitate another culture were also excluded. Finally, the themes used in their study also had to avoid rests and have a minimum of 12 notes, no fermatas, and no grace notes.

Given their sampling criteria, their study focused on an analysis of 137 English themes and 181 French themes drawn from the revised edition of the Barlow and Morgenstern (1948/1983) *Dictionary of Musical Themes*. They found a significant difference between the French and English themes, with English themes showing greater durational contrast (mean nPVI of 46.9) than French themes (mean nPVI of 40.9).

Replication Study

Whenever one uses stringent sampling criteria, there is always the danger that the results are not generalizable. If the difference between French and English music is robust, one might hope to see significant differences under less stringent sampling criteria with a larger musical sample. Consequently, we set out to replicate the Patel and Daniele study using all of the French and English themes from the Barlow and Morgenstern thematic

dictionary—more than a sixfold increase in sample size from 318 to 1925 themes. Specifically, our sample includes 737 English themes by 27 composers and 1188 French themes by 52 composers. The average year of birth for English composers is 1782 (SD = 137 years; range = 1540–1913) and for French composers is 1814 (SD = 76 years; range = 1601–1912). At the same time, we decided to expand the study to include composers of other nationalities: American, Austrian, Czech, Danish, German, Hungarian, Italian, Norwegian, Polish, Russian, Spanish, and Swedish.

Method

In our study, we used the Humdrum Toolkit (Huron, 1994) to calculate the nPVI values for each of the encoded musical themes from the first edition (1948) of the Barlow and Morgenstern thematic dictionary. Our sample included a total of 7784 instrumental musical themes. For the purposes of our study, cultural origin was operationally defined as the composer's nationality. For those composers holding multiple nationalities, their themes were counted in each of the corresponding national samples. Fewer than 6% of the themes were composed by musicians holding more than one nationality. In calculating note durations, acciaccaturas (grace notes) were treated as equivalent to sixty-fourth durations, and fermatas (pauses) were ignored.

Results

Our overall results are shown in Table 1. In the first instance, the results confirm the difference between French and English themes observed by

TABLE 1
Mean Agogic Contrast for Musical Themes According to
Composer Nationality

Nationality	Normalized Pairwise Variability Index (nPVI)	Standard Error	No. of Musical Themes
American	46.3	1.12	415
Austrian	42.0	0.65	1194
Czech	47.1	1.56	232
English	45.6	0.90	737
French	43.7	0.73	1188
German	42.0	0.59	2006
Hungarian	45.4	1.62	244
Italian	42.7	1.06	529
Polish	45.1	1.74	254
Russian	39.8	0.82	736
Scandinavian ^a	45.9	1.79	141
Spanish	42.5	1.85	108

^aDanish, Swedish, Norwegian (Finnish excluded).

Patel and Daniele. The difference between mean values for the French and English is smaller than that found by Patel and Daniele, consistent with our less stringent sampling criteria. Nevertheless our results are significant (Mann-Whitney U -test $U = 414813$; $p = .027$). The less stringent sampling criterion suggests, but does not establish, that the differences between English and French music apply broadly. In general, the results are consistent with the view that spoken prosody leaves an imprint on the music of a culture—at least in the case of English and French.

Discussion

Figure 1 informally conveys some sense of the difference between French and English music. The French song “Frère Jacques” tends to employ successive notes of relatively uniform duration. By contrast, the tune “English Country Garden” tends to employ successive notes of contrasting long and short duration. (The nPVI values are 23.2 for “Frère Jacques” and 59.2 for “English Country Garden.”) It bears emphasizing that these tunes are offered as extreme exemplars. The magnitude of the difference between French and English themes is small, and therefore cannot be used to reliably classify an unknown theme as either French or English. In simple terms, English music “skips,” “lilts,” or “limps” more than French music, but not by much.

Without explicit hypotheses about the prosodic differences between the other cultures, no conclusions can be reliably drawn, and none will be drawn here. It is worth noting however, the mean nPVI value for American composers is comparable to that for British composers. Austrian and German values are indistinguishable. Music from countries that speak Romance languages (France, Spain, Italy) appear to be similar. However, countries that speak Slavic languages (Czech, Polish, Russian) exhibit the greatest diversity.



Fig. 1. Two exemplar melodies illustrating the rhythmic contrast between French and English themes. The French song “Frère Jacques” (top) tends to use successive notes of relatively uniform duration. By contrast, the tune “English Country Garden” (bottom) tends to use successive notes of contrasting long and short durations. (The normalized pairwise variability index (nPVI) values are 23.2 for “Frère Jacques” and 59.2 for “English Country Garden.”) These melodies are extreme rather than typical examples. The actual magnitude of the difference between French and English themes is much smaller than implied by these melodies.

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