Resolving Conflicting Linguistic and Musical Cues in the Perception of Metric Accentuation in Song

Analysis on the Korean Translation of *Happy Birthday to You*

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On the interplay of accentuation in language and in music

lyrics (text) vs. melody (tune)

From Dell and Halle (2005)
Typical resolution of conflict: Tune > Text

  Pitch information for Chinese

  Rhythmic information for Estonian
Atypical resolution of conflict: Text > Tune


(1) Original lyrics
(2) mismatched (no subjects)
(3) Most common resolution

- Korean translation of “Happy Birthday”
“Happy Birthday to You”: English vs. Korean

Phrases 1, 2, 4: HAP-py BIRTH-day to YOU
Phrase 3: HAP-py BIRTH-day dear SA-RAH

Phrases 1, 2, 4: SENG-il CHU-kah HAP-ni-da
Phrase 3: SA-rang HA-neun JI-EUN-e-eui
Experiment:
Syllabic Intensity Tracking through Finger Tapping

Objective

finger tapping while singing → perceived intensity contour of syllables → Anacrusis/ downbeat perception

Equipment & Setup

acoustic drum trigger → MOTU audio interface → Computer running Audacity → Praat for analysis
Subjects

12 Native English speakers with no knowledge of Korean (Group I)

18 Korean-English bilinguals (Group II)

Complete fluency in English

Complete fluency in Korean

Group I (n=12)  Group II_1 (n=5)  Group II_2 (n=5)  Group II_3 (n=6)  Group II_4 (n=2)
Hypothesis

Perceive Anacrusis

Downbeat

(1) ACROSS-GROUP singing in English

Native English Speaker  Native Korean Speaker
(Offline effects)

(2) WITHIN-SUBJECT by a Kor-Eng bilingual

Sing in English  Sing in Korean
(Online effects)
Task

Part 1: Short Questionnaire

Part 2: Perform in subject’s primary language (Group I & II)

[1] sing (“la”)
[2] sing (“la”) + tap
[3] recite (actual lyrics)
[4] sing (actual lyrics)
[5] sing (actual lyrics) + tap

Part 3: Perform in subject’s secondary language (Group II only)

Identical to Part 2, except with secondary language

Part 4: Final Survey
Summary of Analysis Procedure

1. Record 5 trials per subject-language
2. Match tap intensity peaks to the syllables in the text
3. Calculate the change in intensity (as ratio) between consecutive syllables:

\[
\text{Ratio}_A = \frac{\text{"py"}}{\text{"hap"}} = \frac{\text{"birth"}}{\text{"hap"}}
\]

\[
\text{Ratio}_B = \frac{\text{"ni"}}{\text{"hap"}} = \frac{\text{"da"}}{\text{"hap"}}
\]

4. Determine \textbf{Ratio}_A and \textbf{Ratio}_B
Result: Across Group comparison over Pattern A

All Subjects (sing in English): RatioA = "birth"/"hap"

Intensity Ratio (n=20 per subject)

All Subjects (n=30)
Result: Within-Subject comparison over Pattern B

Within-Subject Comparison of RatioB ("you"/"to")

Sing in English
Sing in Korean

Group II Subjects (n= 5+5+6+2= 18)
Conclusion

(1) ACROSS-GROUP data over Pattern A:

Native English Speaker  Native Korean Speaker

(2) WITHIN-SUBJECT data over Pattern B:

Sing in English  Sing in Korean
1. **online effects** of lyrics on metric perception of songs

2. **offline effects** of L1 when singing in L2

3. **language fluency** may affect the extent to which linguistic stress patterns play a role in the overall beat-strength perception of songs.

Language can play a significant role in the inference of beat accentuation (and by extension, the metric perception) of songs.
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Selected References


