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Binary Musical Bias in Irregular Meters

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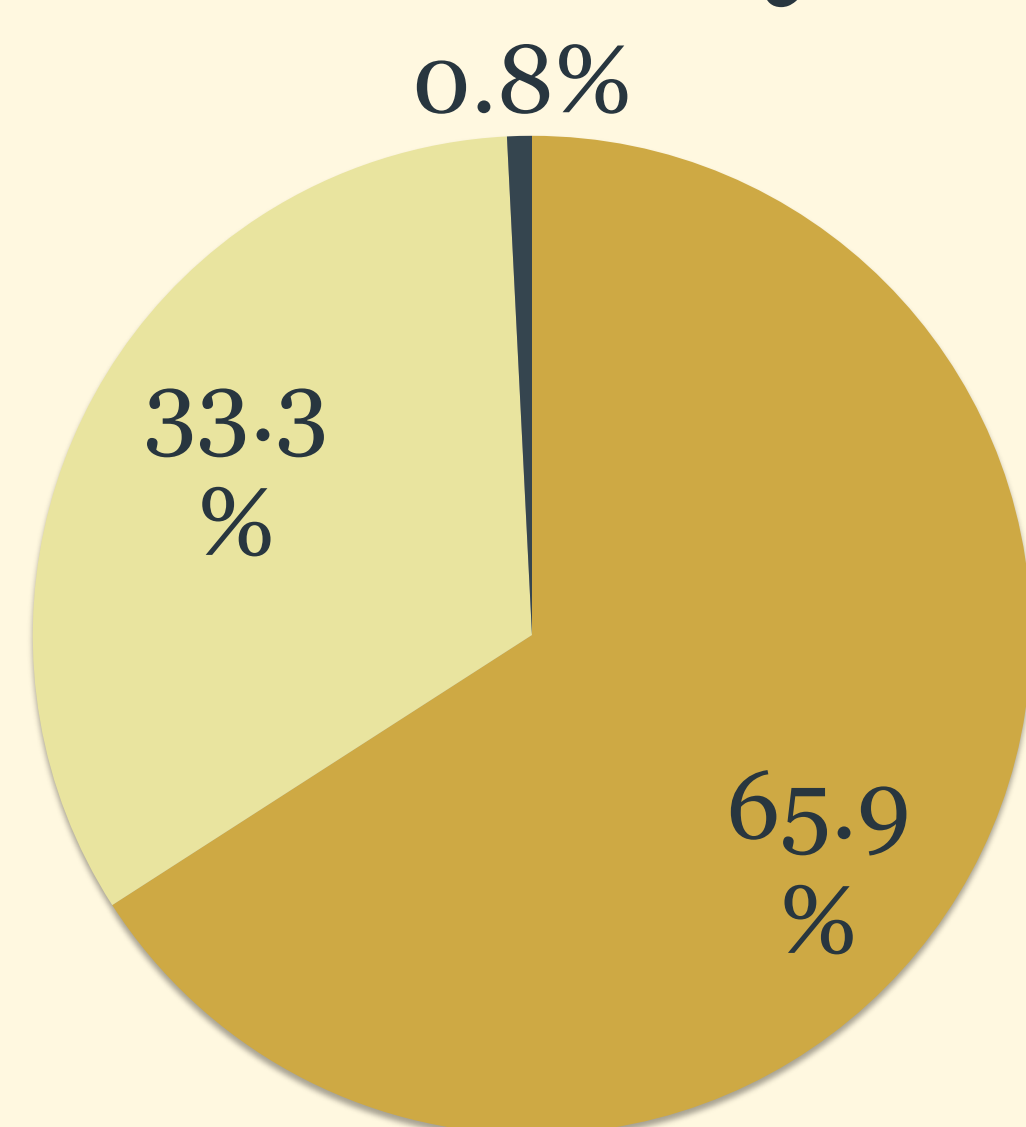
Binary Musical Bias in Irregular Meters

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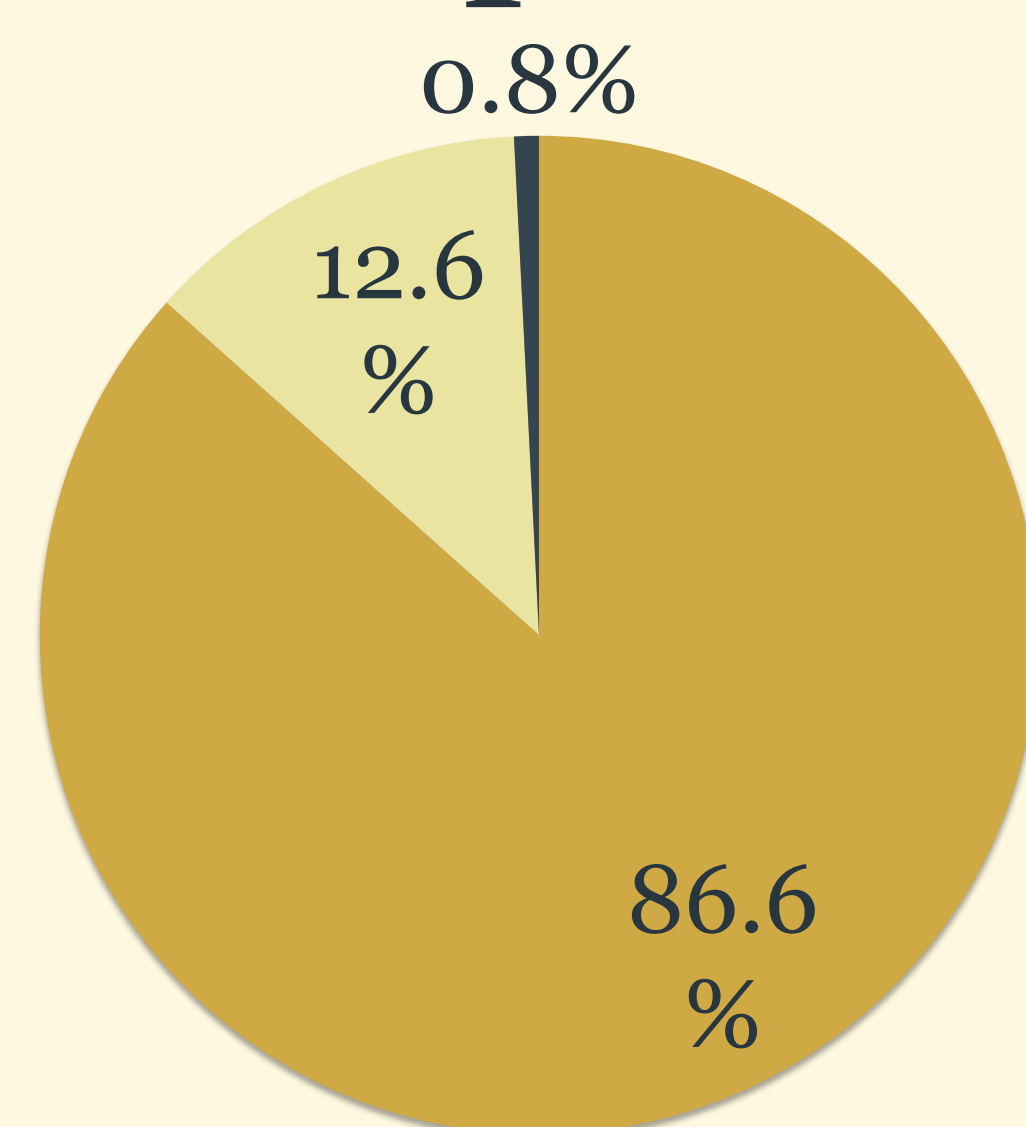
Background

- Simple and binary meters are more prevalent in Western music literature than compound and ternary meters (Huron, 2006)
- Infants can better detect changes in melodic and harmonic sequences when they are in duple meters rather than triple meters (Bergeson & Trehub, 2006)
- Both children and adults can reproduce binary rhythms better than ternary rhythms (Drake, 1993)

Binary vs Ternary



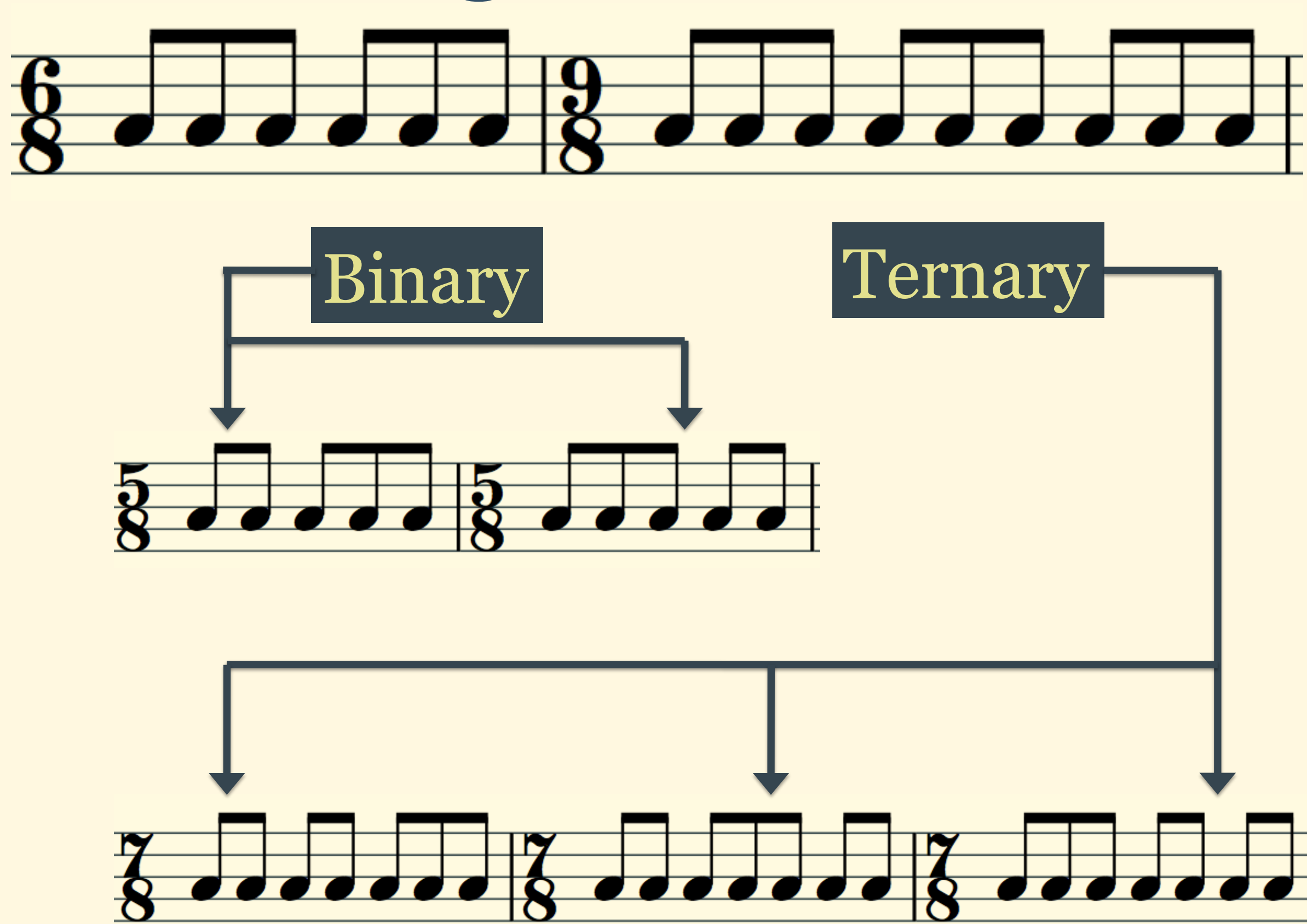
Simple vs Compound



Data from Huron, 2006

- Binary
- Ternary
- Irregular
- Simple
- Compound
- Irregular

The Binary Bias in Irregular Meters?

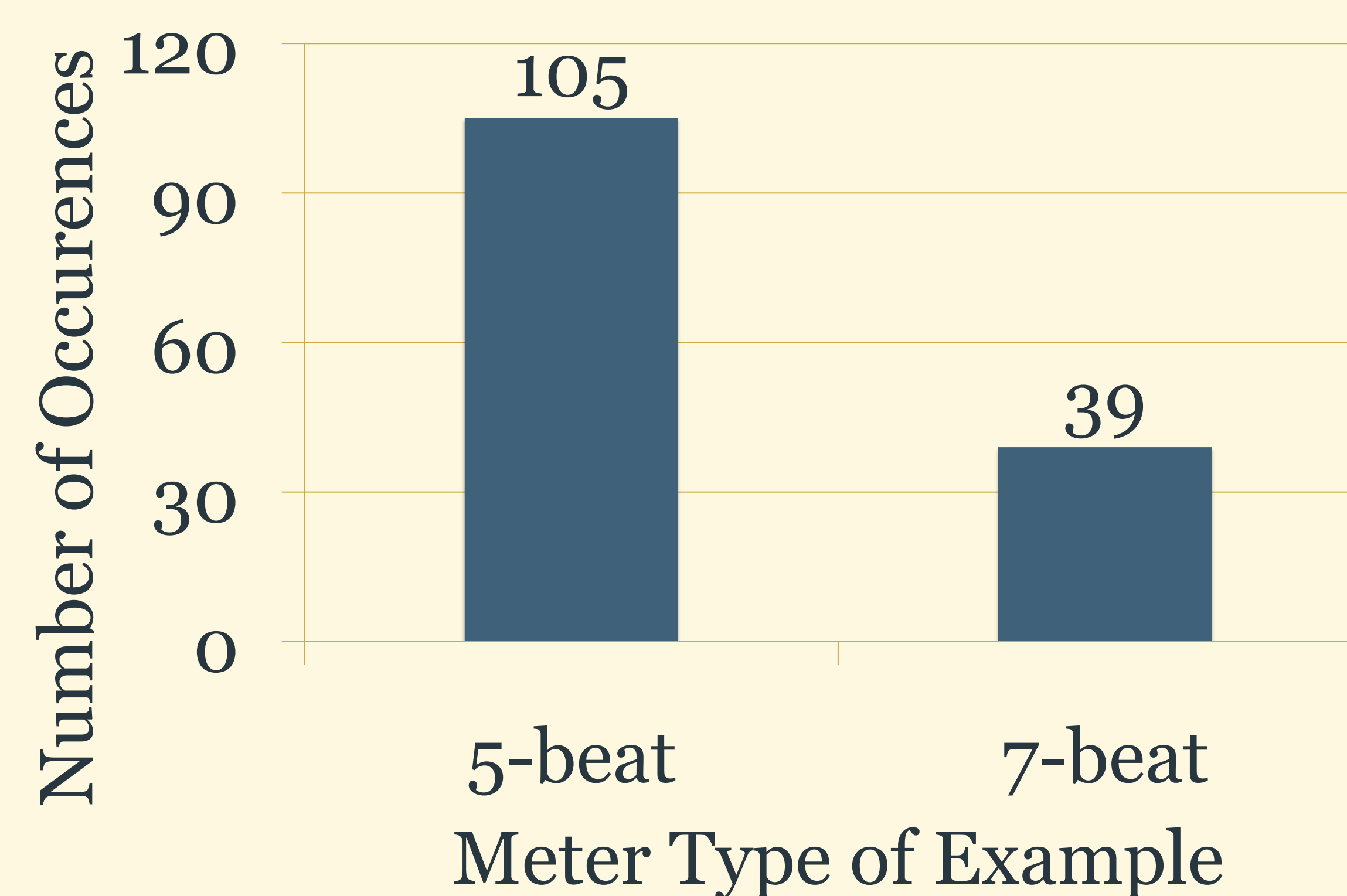


- Does the binary preference in regular meters (e.g., 6/8 and 9/8) transfer to irregular meters (e.g., 5/8 and 7/8)?
- Hypothesis: **5-beat meters should be more prevalent in music literature than 7-beat meters**
- 5/8 ≈ is often divided into 2 groups (2+3 or 3+2)
- 7/8 ≈ is often divided into 3 groups (2+2+3, 2+3+2, or 3+2+2)

Method

- Examined 7 musical sources
 - 4 sight-singing books (Berkowitz, Fontrier, & Kraft, 1997; Hoffman, 2009; Karpinsky & Kram, 2007; Ottman, 1956).
 - Anthology of Music: Non-European Folklore and Art Music (Schneider, 1972)
 - Anthology of Music: European Folk Song (Wiora, 1966)
 - A Dictionary of Music Themes (Barlow & Morgenstern, 1948)
- Counted examples with 5-beat metrical patterns and 7-beat metrical patterns
- To be counted, the example had to stay in the same meter for the first four measures

Results



In this corpus, 5-beat metrical patterns occur more frequently than 7-beat metrical patterns, $\chi^2(1, N = 144) = 30.25, p < 0.001, \phi = 0.46$

Discussion

- This corpus of music showed a dominance of 5-beat over 7-beat meters
- The finding could be viewed as an extension of the binary bias seen in regular meters; 5-beat patterns might be comparable to binary meters, and 7-beat meters might be comparable to ternary meters
- Mostly Western-based sources were reviewed; future studies might look at music from a wider variety of cultures

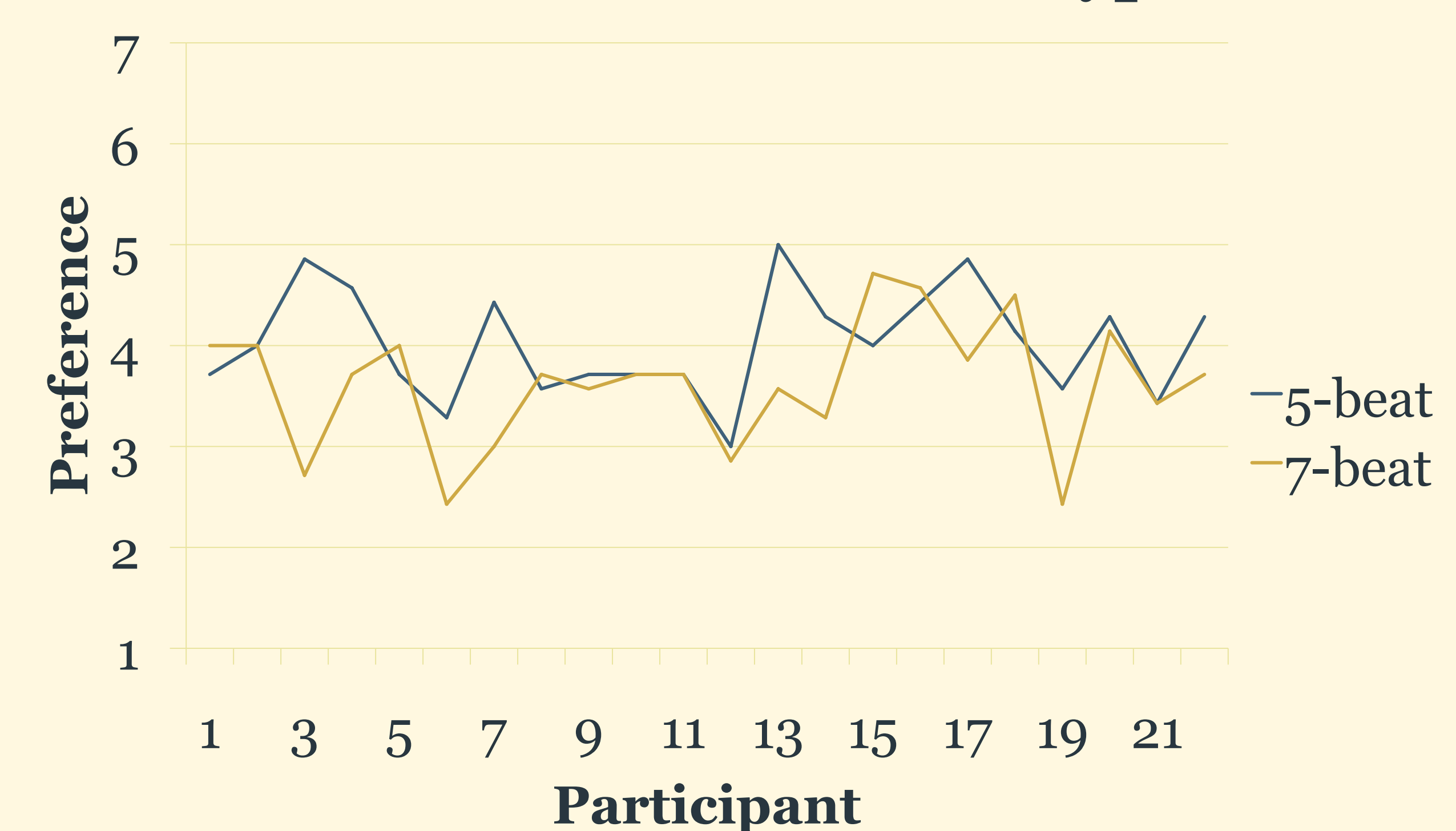
Acknowledgements

Many thanks to people who participated in the study, the Music Cognition Lab, Dr. Plazak, and Dr. Montpetit.

Preference Study

- A follow-up study was conducted to investigate if listeners prefer rhythms in 5-beat patterns over rhythms in 7-beat patterns
- Participants were played 28 1-measure rhythms (each repeated 4 times) in various time signatures (7 of each of the following: 3/4, 4/4, 5/4, and 7/4)
- After hearing each rhythm, participants marked their preference on a 7-point Likert scale (1 = strongly dislike; 7 = strongly like)
- Preliminary results were skewed in the predicted direction with a stronger preference for 5-beat patterns ($M = 4.03, SD = 0.54$) over 7-beat patterns ($M = 3.62, SD = 0.63$).
- This result may indicate an extension of the binary bias into irregular meters
- Further analysis of other factors, including musical background of participants and various musical features (syncopation, pitch, and number of notes) will be required.

Mean Scores for Meter Type



References

- Barlow, H. & Morgenstern, S. (1948). *A dictionary of musical themes*. Crown Publishers.
- Bergeson, T. R., & Trehub, S. E. (2006). Infants' perception of rhythmic patterns. *Music Perception: An Interdisciplinary Journal*, 23(4), 345-360.
- Berkowitz, S., Fontrier, G. & Kraft, L. (1997). *A new approach to sight singing*. New York: W.W. Norton & Co.
- Drake, C. (1993). Reproduction of musical rhythms by children, adult musicians, and adult nonmusicians. *Perception & Psychophysics*, 53(1), 25-33.
- Hoffman, R. (2009). *The rhythm book*. Harpeth River Publishing.
- Huron, D. B. (2006). *Sweet anticipation: Music and the psychology of expectation*. Cambridge, Mass.: MIT Press.
- Karpinski, G. & Kram, R. (2007). *Anthology for sight singing*. New York: Norton.
- Ottman, R. W. (1956). *Music for sight singing*. Prentice-Hall.
- Schneider, M. (1972). *Non-European folklore and art music*. A. Volk Verlag.
- Wiora, W. (1966). *Anthology of music: European folk song*. Arno Volk Verlag.