The Influence of the Acoustic Environment on Gait
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INTRODUCTION
Gait impairment is among the major symptoms of Parkinson’s Disease (PD) increasing the risk of falls and injury in this population. Gait impairment also affects mobility and quality of life. However, current pharmacological and surgical treatments do not address this impairment. There remains a need to find alternative treatment strategies for gait impairment in persons with PD. Walking in time with an auditory cue is a training intervention shown to improve gait function in persons with PD. However, research examining different techniques of optimal training parameters is lacking.

OBJECTIVE
The objective of this study was to examine gait in healthy young adults using three different strategies: 1) self-paced 2) auditory cues using a metronome and 3) auditory cues using preferred music

We hypothesize that auditory cues, both in the simple cue condition and the preferred music condition will improve gait function.

METHODOLOGY

Table 1: Participant Demographics

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<tr>
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<th>HYA n=18</th>
<th>PD n=4</th>
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<tbody>
<tr>
<td>Age (Mean(SD)) 21 (1.3)</td>
<td>68 (5.228)</td>
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<tr>
<td>Gender 7 M, 11 F</td>
<td>1 M, 3 F</td>
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<tr>
<td>Years of Musical Experience (Mean(SD)) 5.661 (5.76)</td>
<td>30 (24.04)</td>
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Data Collection
- Three walking conditions included self-paced, metronome cue, and music cue.
- Participants completed five trials for each of the three walking conditions on a 10 meter GaitRite mat.
- The metronome cue and the preferred music cue were matched to the average cadence from the self-paced condition.
- Preferred music cue was matched using PitchSwitch.

Song Examples:
- “Hey Jude”
- “Closer”
- “Sweet Home Alabama”
- “Go Cubs Go”

Data Analysis
- Spatial-temporal gait data were exported from the GaitRite software.
- Repeated measures ANOVA were completed for each outcome measure.
- Significance was set at $\alpha = 0.05$.

RESULTS

Figure 2.
- A shows the step time for both right and left feet of HYA (p=0.512) and participants with PD (p=0.527).
- B shows the step width of gait for both right and left feet of HYA (p=0.196) and participants with PD (p=0.899).
- C shows the step length of gait for both right and left feet of HYA (p=0.992) and participants with PD (p=0.055).
- D shows the velocity of gait of HYA (p=0.642) and participants with PD (p=0.937).
- E shows the cadence of gait of HYA (p=0.398) and participants with PD (p=0.595).

No significant differences were found for any of the measures.

CONCLUSION
Our results show that there is no significant change in gait as a result of walking with an external auditory stimulus. This could be a result of our small sample size. Next we plan on analyzing variability, as previous research in this lab has shown that variability is the movement performance outcome measure that changes with music.