A Thesis Proposal

College-Aged Student Perception of Average iPod Listening Volumes:
Correct or Incorrect?

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Current Literature

• 12 million cases of adult hearing loss:
  • Partially due to short term/long term noise exposure (NIOSH, 1998).
  • Multiple exposures to short-term loud noise results in long-term hearing deficits (Chung, Des Roches, Meunier, & Eavey, 2005).

• Prevalence of Noise Induced Hearing Loss (NIHL):
  • Rising across all ages (Daniel, 2007; Shargorodsky, Curhan, Curhan, & Eavey, 2010).

• Leading cause of NIHL:
  • Personal listening devices (PLDs)(Punch, Elfenbein, & James, 2011).
Current Literature Continued

- The National Institute for Occupational Safety and Health (NIOSH, 1998) outlines safe levels of noise exposure for the workplace (recommended noise exposure limit – REL).
- PLDs have the potential to exceed NIOSH REL standards, potentially leading to permanent hearing loss, as evidenced by research studies (Epstein, Marozeau, & Cleveland, 2010; Levey, Levey, Fligor, 2011).
Why the increase?

• Decreased awareness:
  • of selected loudness levels and lengths of listening times (Shargorodsky, et al., 2010).
  • of delayed, incremental effects of long term hearing loss (Chung, Des Roches, Meunier, & Eavey, 2005; Epstein, Marozeau, & Cleveland, 2010).
  • Lack of concern for short-term effects/warning signs → underestimation of warning signs
  • of the potential for PLDs to cause damage to hearing acuity.
In order to study listening behaviors from a large population of PLD users, researchers have utilized online survey methods. Surveys decrease costs by eliminating the need for expensive equipment and costs of human subjects compensation, while allowing researchers to reach out to larger populations (Chung, Des Roches, Meunier, & Eavey, 2005; Danhauer, et al., 2009; Hoover, 2010).
A Comparison

• Obtaining actual measurements are more costly than survey methods, but may be more reliable due to the potential for decreased awareness and subject candor.
• If we compare self-report to actual measurements we can determine the presence or absence of self-awareness
  • Potentially establish credibility to prior and future surveys (Epsteein, et al., 2010; Danhauer, et al., 2009; Hoover, 2010).
    • Decreases cost
    • More immediate results/feedback
  • Aid in the development of educational programs (Daniel, 2007)
The Purpose is to Determine:

1. if PLD users are accurately reporting and self-monitoring loudness levels,

2. if individuals using PLDs at harmful levels are aware of the potential for hearing damage, and

3. if individuals with average or above average cardiovascular fitness are more aware of the potential for hearing damage secondary to PLD use and listen at more appropriate SPLs than those who fall into below average categories.
Participants

- Goal = 200 Participants
  - 50 subjects from each class (Freshman, Sophomore, Junior, Senior)
  - Equal males & females
  - Recruited with: scripted e-mails, fliers, & classroom announcements
- Participants will be divided into groups for comparison based on academic class and reported listening times (hours/week).
- All are being screened for middle ear disease using otoscopy and tympanometry (Jerger, Burney, Mauldin, & Crump, 1974).
- The Committee for the Use of Human Subjects in Research at Miami University approved this study. All subjects sign informed consent agreements and are compensated ($20) for their time.
Instrumentation

- Questionnaires
  - Health History
  - Listening Habits
    - Usage groups
  - Knowledge Base
- Audiometric Data
  - Otoscopy/Tympanometry
  - Pure Tone testing
  - Verifit VF-1 Measures
    - iPod testing
    - Session Data
    - Reliability & white noise (baseline) data
Statistical Analysis

• Descriptive Statistics:
  • Pure tone thresholds in dB HL conversions to SPL for analysis purposes (ANSI S3.6 2004 American National Standard Specifications for Audiometers).

• ANOVA with pure tone thresholds as the dependent variables and year in school, usage values of the PLD, and dB SPL measured with the Verifit VF-1 as the independent variables.

• Verifit VF-1 values will be converted to A-weighted equivalents for comparison to NIOSH standards.
Potential Journals for Publication

- **Audiological:**
  - American Journal of Audiology
  - Journal of Speech, Language, and Hearing Research
  - International Journal of Audiology
  - Journal of the American Academy of Audiology
  - Ear & Hearing

- **Cardiovascular:**
  - Perceptual and Motor Skills
Cardiovascular fitness:

- Believed to play a significant role in regulating hearing sensitivity and linked to susceptibility to NIHL (Hutchinson, Alessio, & Baiduc; Ickes, Espili, & Glorig, 1979).
- High fitness serves to counteract the effects of trauma and stress caused by excessive noise (Contrada, et al. 1982; Ismail et al., 1973).
- The question remains if increased cardiovascular fitness correlates with general health and wellness factors, resulting in increased awareness of and attention to healthy listening habits.
- Correlations may be made if cardiovascular fitness levels were compared to self-report of SPLs, actual SPLs, and pure tone thresholds.