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Meritorious Poster Submission

For

Musicians Hearing Handicap Index: New Tool for the Assessment of Functional Hearing in Music Professionals

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Aikaterini Vardonikolaki, Vassilios Pavlopoulos, Nikolaos Markatos, Ilias Papathanasiou, Georgios Papadelis, Miltos Logiadis, Constantinos Pasiadis, Athanasios Bibas

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Musicians Hearing Handicap Index (MHHI): New tool for the assessment of functional hearing in music professionals

Aikaterini Vardonikolaki¹, Vassilis Pavlopoulos², Nikolaos Markatos¹, Ilias Papathanasiou³, Georgios Papadelis⁴, Milto Logiadis⁵, Constantinos Pastiadis⁴, Thanos Bibas¹

- 1st Department of Otorhinolaryngology – Head & Neck Surgery, National and Kapodistrian University of Athens, Greece
- Department of Psychology, National and Kapodistrian University of Athens, Greece
- Technological Educational, Institute of Western Greece
- School of Music Studies, Aristotle University of Thessaloniki, Greece
- Faculty of Music & Audiovisual Arts, Ionian University, Greece

Objectives

AIM: This study is designed to quantify the hearing difficulties music professionals could face in relation to their functional hearing.

Musicians and other professionals working with music are a special occupational group with a high prevalence of tinnitus and hyperacusis which could negatively affect their work (Kähärit et al., 2003; Schink et al., 2014). This impairment is not always demonstrated by pure tone audiometry (PTA) (Schaette and McAlpine, 2011).

A vast range of assessment tools has been developed up to date for screening for problems in musicians such as singing disorders, performance anxiety, movement disorders etc. Nevertheless, no tool has been developed so far to measure how tinnitus could affect the functional hearing of musicians, along with hyperacusis and hearing loss (Cohen et al., 2007; Cirakoglu and Sentürk, 2013; Brugués, 2009).

Methods

The validity and reliability of a new questionnaire we created to assess hearing handicap in musicians (MHHI) was tested in a group of 176 professionals. Participants were either professional musicians, or sound engineers/music producers, aged between 18 and 59 years old. All of them underwent clinical examination before they enter the main study, and those with conductive hearing loss, temporary thresholds shift, retrocochlear pathology or Meniere disease were excluded from further assessment.

Participants were divided into three groups: 1) a control group, 2) a group with symptoms such as tinnitus, hyperacusis, diplacusis and distortion (THDD), and 3) a group including professionals with abnormality in the audiogram (Figure 1). The 43 items of the questionnaire have been divided into four conceptual factors and test-retest reliability was evaluated.

The significance of between-groups difference in total score was assessed by the use of the Kruskal-Wallis test. Mann-Whitney U test with a Bonferroni correction was subsequently used in post hoc analysis.

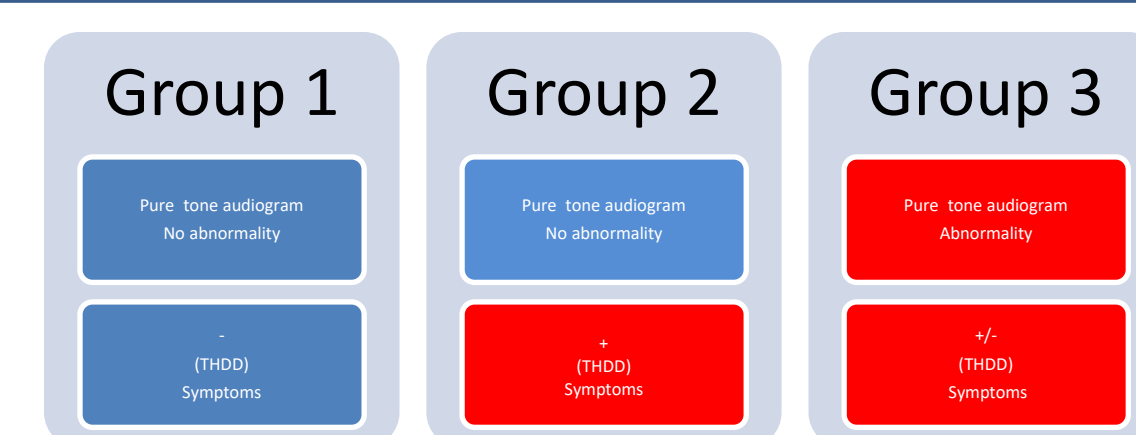


Fig 1: Participants were divided into 3 groups according to symptoms and audiogram

Results

Both content validity and reliability for the total score and was high. (Cronbach $\alpha = 0.918$ and Spearman rho $r(56) = 0.926$; $p < 0,001$). Cronbach α ranged from 0.733 to 0.856 among the four factors (Fig. 2).

Differences in total score were significant, both among all groups ($p < 0.001$), and within each pair separately ($p < 0.01$). Figure 5 shows that musicians and sound engineers with symptoms such as tinnitus and hyperacusis predominately (see Fig. 3), scored higher than any other group, although this is not confirmed by any disorder in classical audiometry (Fig. 4). The number of participants, age and sex, median score/range organized by group, are displayed in Figure 6.

Our findings suggest that MHHI would be a valuable tool to quantify functional hearing in professionals exposed to music.

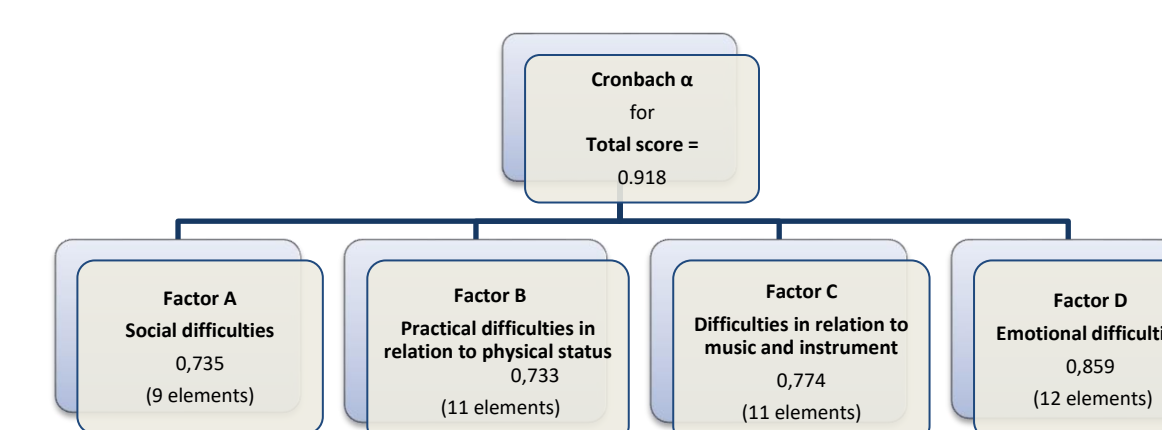


Fig 2: Cronbach α among the 4 factors.

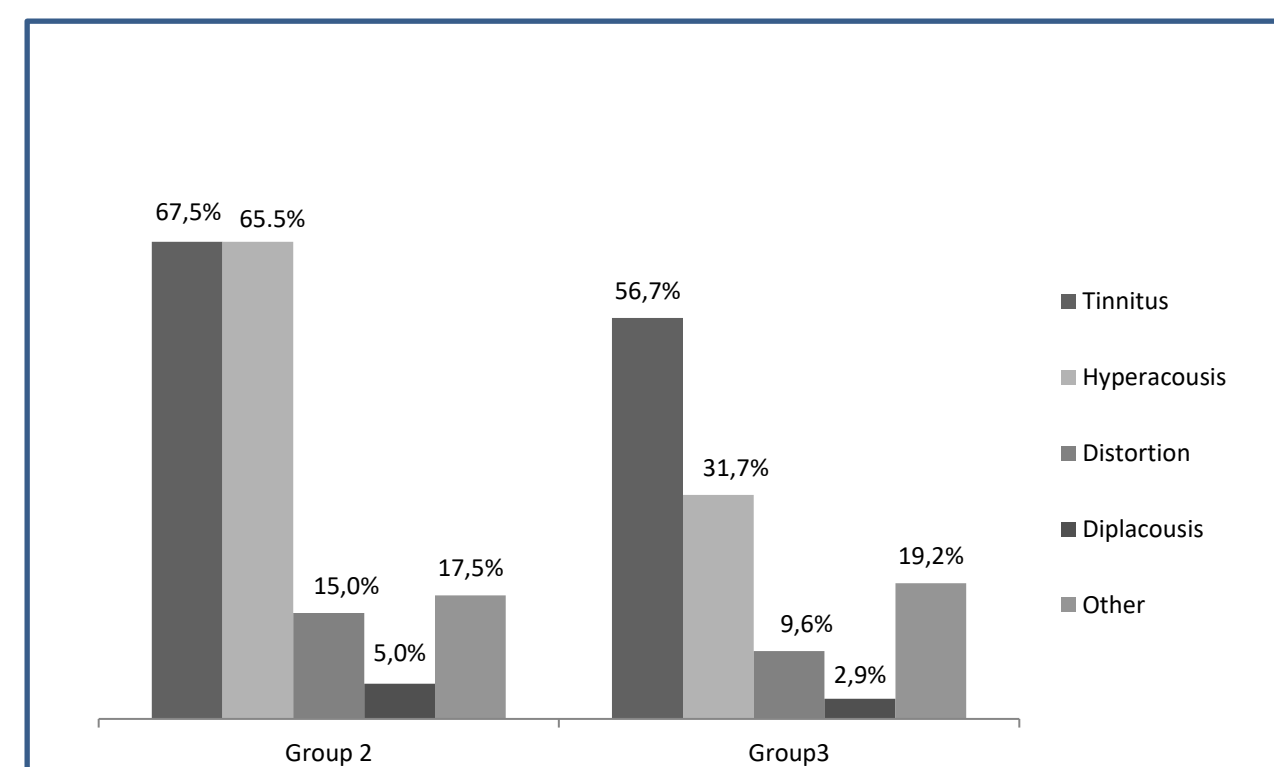


Fig 3: Symptoms among groups. Tinnitus and hyperacusis were higher in Group 2.

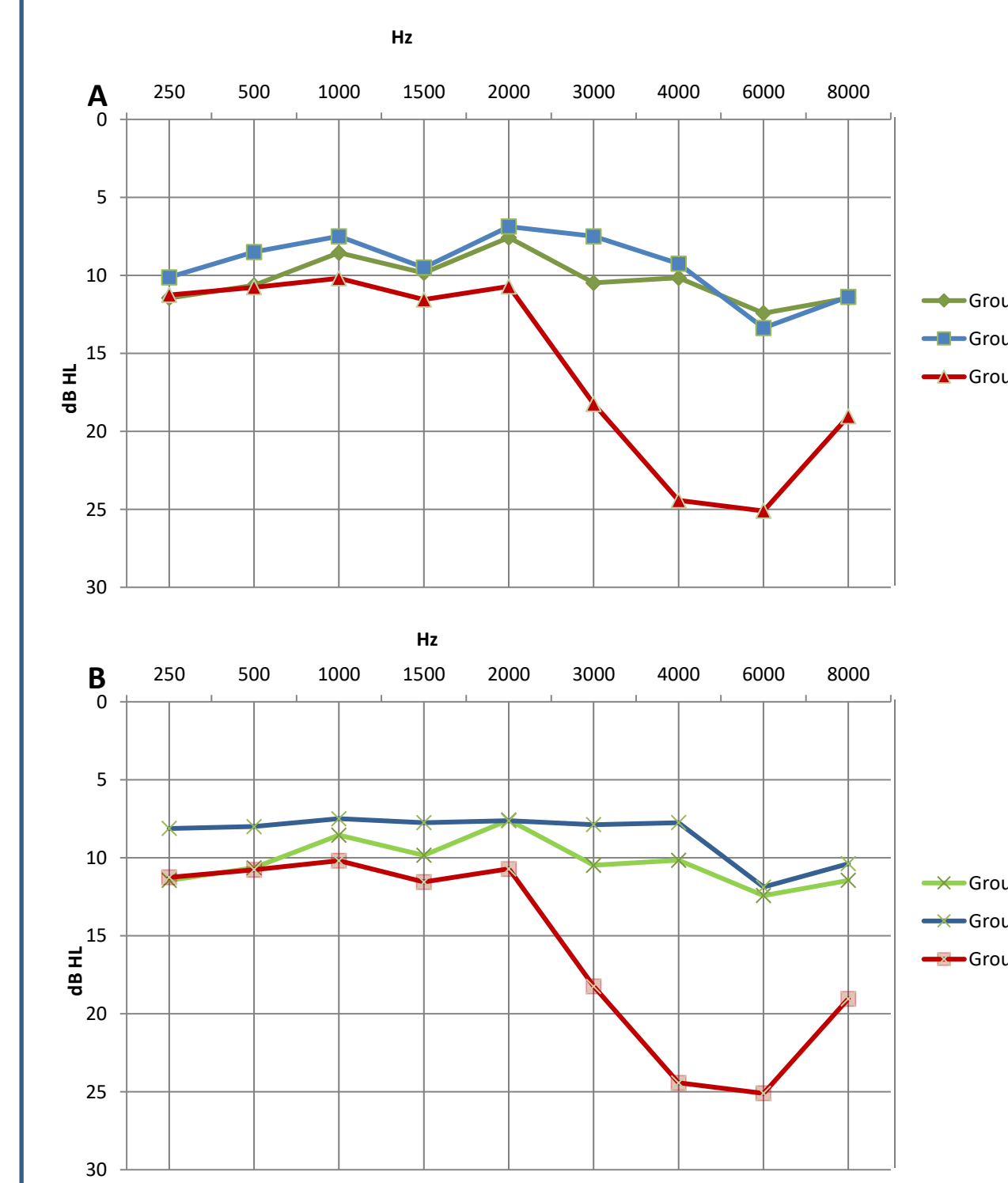


Fig 4: Mean values for thresholds, measured in classical audiometry for right (A) and left (B) ear per groups.

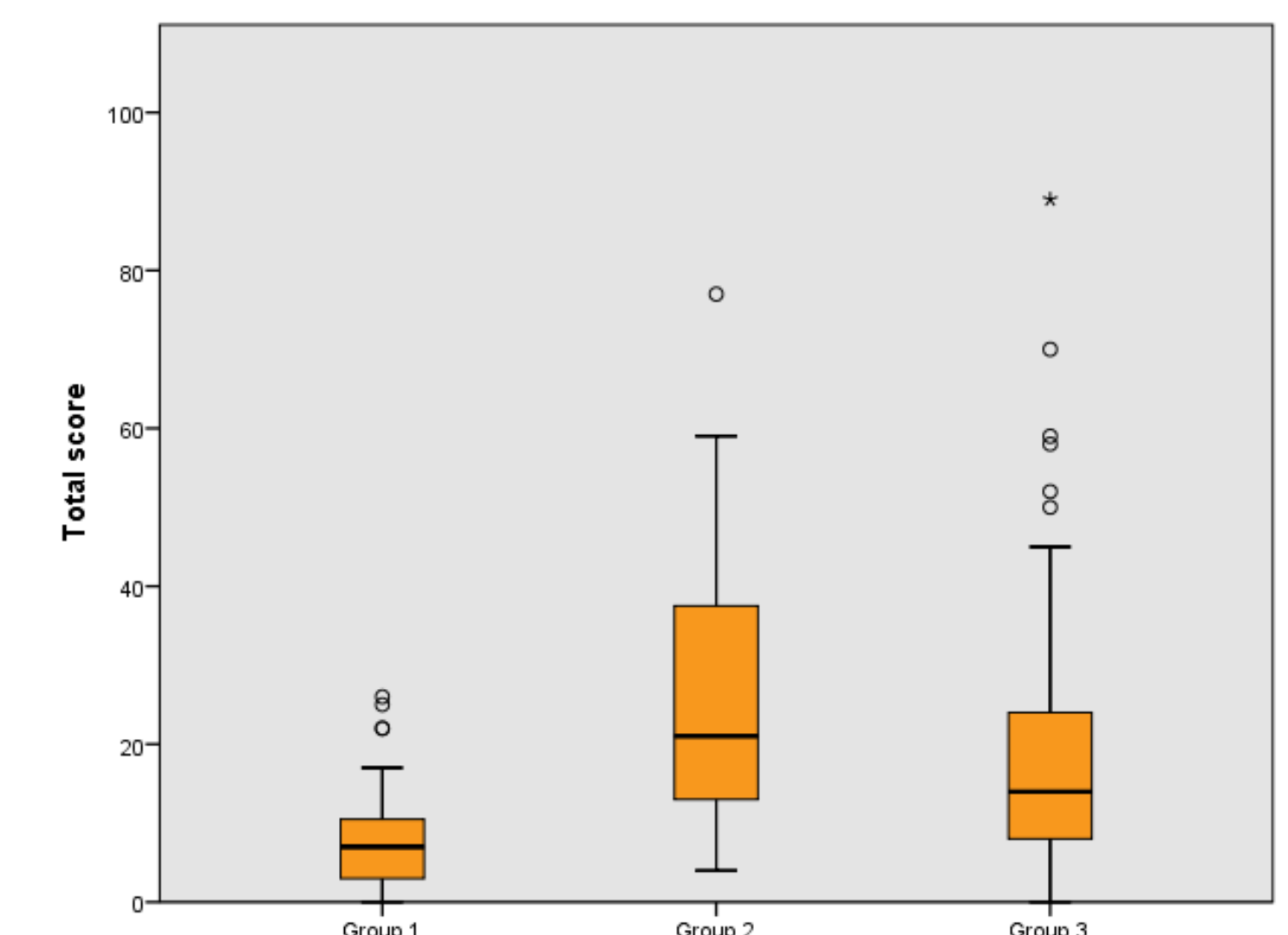


Fig 5: Distribution of participants total scores by group. Group 2 scored significantly higher as compared to the other two groups.

	N (Male)	Age	n (Sound Engineers)	Median score (Range)
Group 1	32 (26)	29.0 (18,39)	17	7.0 (26)
Group 2	40 (24)	34.0 (21,50)	10	21.0 (73)
Group 3	104 (84)	37.0 (19,59)	34	14.0 (89)

Fig 6: Distribution of median values for total score, age, sex, number of sound engineers and participants among groups

Acknowledgments

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