



Noise sensitivity and musical background

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Summary

Noise sensitive individuals have a predisposition to attend to sounds and to perceive them negatively. Noise sensitivity predicts noise annoyance. The aim of this study was to investigate if noise sensitivity is associated with musical background. A total of 197 participants were recruited in Finland (N=91; 44 men, 47 women) and in Italy (N=106; 10 men, 96 women). The age range was from 19 to 56 years ($M = 28.57$, $SD = 7.93$ for Finland; $M = 24.71$, $SD = 8.01$ for Italy). We administered questionnaires and listening tests both online and in the laboratory, focusing on musical background. Noise sensitivity was studied using the Weinstein's Noise Sensitivity Scale administered online. The subjects were divided into 3 groups according to their musical experience. The groups were non-musicians (N = 103), amateur musicians (N = 44) and musicians (N = 50). Non-musicians, amateurs and musicians did not differ significantly from each other in noise sensitivity. This finding hence does not relate noise sensitivity with a history of long-term exposure to music.

PACS no. 43.66.+y, 43.50.+y

1. Introduction

Noise sensitivity refers to physiological and psychological internal states, which increase the degree of reactivity to noise [1] and is a predictor of noise annoyance [2, 3].

Noise sensitive individuals have a predisposition to attend to sounds and to perceive them negatively. They also display stronger emotional reactions to noise. No strong evidence for an auditory component at threshold levels in noise sensitivity has been found, since it has not been related to auditory acuity [3]. Noise sensitivity aggregates in families, and the estimate of heritability is 36 % [4].

The associations of noise sensitivity with somatic and psychological factors have been found to differ somewhat between men and women. Noise sensitivity has been associated with stress, hostility and hypertension in women, while in men it was associated with stress, emphysema and use of sleeping pills and tranquilizers [5].

Noise sensitivity increases the harmful health effects of noise like sleep disturbance [6], cardiovascular disease [7] and impaired cognitive performance [8]. Noise may prevent individuals with high noise sensitivity from achieving the same work results compared to less sensitive individuals leading to psycho-somatic, neurotic and other difficulties while individuals with lower noise sensitivity may be expected to better adapt to noise during mental performance [8]. A significant correlation was found between self-reported health (“somatic symptoms” and “anxiety and insomnia”) and noise exposure in the noise sensitive group, but no significant correlation was observed in the non-sensitive group [9].

A recent study by Franek (2009) examined the relationship between noise sensitivity and musical background. Findings showed that active musicians are characterized by slightly higher noise sensitivity compared to non-musicians. In that study people, who didn't listen to background music very frequently and those who preferred complex and reflective musical genres, had also slightly higher level of noise sensitivity [10].

The aim of this study was to investigate if noise sensitivity is associated with musical background in Finland and Italy.

2. Materials and Methods

2.1 Subjects

A total of 197 participants was recruited in Finland (N=91; 44 men, 47 women) and in Italy (N=106; 10 men, 96 women). The age range was from 19 to 56 years (M = 28.57, SD = 7.93 for Finland; M = 24.71, SD = 8.01 for Italy).

2.2 Methods

We administered online questionnaires focusing on musical background and noise sensitivity.

2.2.1 Musical background

Musical background questionnaires were accessing musical education, duration of musical training, age of musical training onset and amount of weekly practice. These variables were collected to affiliate subjects to a musical group and were not analyzed for association with noise sensitivity.

2.2.3. Noise sensitivity

Noise sensitivity was studied using the Weinstein's Noise Sensitivity Scale administered online. It consists of 21 items, which were presented on a 6-point scale rating from “agree strongly” to “disagree strongly”. Several items are scored in opposite direction before responses are summed and those items were scored in opposite direction [11].

2.3. Data analysis

The difference in noise sensitivity between countries, genders and groups was tested in separate one-way ANOVAs. Greenhouse-Geisser corrected p values are reported.

3. Results

In general noise sensitivity was in the range from 25 to 121 with mean of 81.07 (SD = 17.6). We did not find any differences in noise sensitivity between two countries. No gender differences in noise sensitivity were found neither in the general sample of subjects nor in Finland and Italy separately. Considering this, we combined the Finnish and Italian samples together for the following analysis of noise sensitivity in relation to musicianship, musical aptitude and listening to music.

The subjects were divided into 3 groups according to their musical experience. The groups were non-musicians (N = 103), amateur musicians (N = 44) and musicians (N = 50).

3.1 Noise sensitivity and musicianship

Non-musicians, amateurs and musicians did not differ significantly from each other in Noise Sensitivity Score.

4. Discussion

In this study, non-musicians, amateurs and musicians did not differ significantly in their noise sensitivity. The findings obtained with the Finnish and Italian samples did not replicate previous findings by Franek (2009) that people who play any musical instrument or have played in the past have slightly higher level of noise sensitivity to certain noise dimensions than people, who never played a musical instrument but who like to listen music. However, in that study individuals who were not interested in music, were also slightly more noise sensitive [10]. There are methodological differences between the current study and the study of Franek where factor analysis was used to examine the factor structure of reactions to noise. Five factors of sensitivity to different types of noises were formed. The impact of different musical factors on noise sensitivity to different types of noises was studied [10]. In the current study only one Noise Sensitivity Score obtained using Weinstein's Noise Sensitivity Scale was used in the analyses.

5. Conclusions

Non-musicians, amateurs and musicians do not differ significantly in their noise sensitivity. Further studies are needed to investigate whether other musical background variables than the musical expertise we tested here, would positively interact with noise sensitivity.

Acknowledgement

This study was financially supported by Centre for International Mobility (CIMO), which is gratefully acknowledged.

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