

# Review of: "Acoustic Over-Exposure in the Institutional Land Use of Calabar Metropolitan Area, Cross River State, Nigeria"

Romina Fucà<sup>1</sup>

<sup>1</sup> University of Verona

Potential competing interests: No potential competing interests to declare.

The author of this paper delves into a crucial subject—the issue of acoustic over-exposure. The study is conducted at two major tertiary institutions in the Calabar metropolis, Nigeria. The author employs a specific tool to collect sound data, subsequently analysing outcomes through ANOVA. The observations made by the author encompass various sources of noise, including socio-economic activities, traffic within and outside the surveyed locations, and nearby business establishments. *Section 1, Introduction* introduces the tertiary institutions of Calabar, Nigeria, as the focal points of the study. The paper highlights the recent growth of universities in Nigeria and underscores the potential disruption of the educational environment due to excessive noise, which may impede teaching and learning. *Section 2, The Problematic*, reiterates the imperative to control noise in educational institutions to enhance learning outcomes and foster significant cognitive growth among students. The author emphasizes the need for a school environment "free from any form of noise pollution and also free from all forms of noise or economic activities," aiming for a quiet environment that prioritizes concentration and learning. *Section 3, Aim and Objectives of the Study*, presents a comparative analysis of noise levels across tertiary institutions. The goal is to recommend measures for mitigating the effects of noise in the surveyed locations in Nigeria and beyond. The primary hypothesis (H0—*Section 4, The Study Hypothesis*) posits that there is no significant variation in noise levels between the two institutions, without specifying an alternative hypothesis (H1).

*Section 5, The Study Area*, briefly describes the two locations—the University of Calabar and the University of Cross River State—both situated in the town of Calabar on approximately 17 hectares. Figure 1 provides a detailed depiction of the two sites. *Section 6, Method of Study*, elucidates the specific tool employed by the author to detect sounds in the Calabar locations. Figure 2 compares the detected noise in both locations with the limits recommended by the World Health Organization (WHO), revealing that both institutions "exceed WHO noise level limits." Figure 3 and Figure 4 represent the main components of noise in the first and second universities, respectively. In *Section 7, Discussion of Findings* the author conducts an ANOVA on the components of noise. Recommendations are outlined in *Section 8*, detailing the timing and modalities for reducing noise. *Section 9, Conclusion*, reiterates the causes of noise in the Calabar locations, emphasizing how socio-economic and educational growth does not always align with controlled noise levels in study environments.

*Amendments:*

I personally suggest the author add an alternative hypothesis that explores the potential for variations in noise levels between the two institutions. For instance:

**H1: There is a significant difference in noise levels between the University of Calabar and the University of Cross River State, with one institution exhibiting higher levels of acoustic over-exposure than the other.**

This hypothesis allows for a more comprehensive examination of the noise levels and provides a basis for further statistical analysis and comparison. Regarding the timing of noise detection, it is a crucial factor to consider. I therefore recommend the authors provide details on when the noise measurements were conducted—whether in the mornings, evenings, or during specific periods of the year—because this would enhance the study's precision and offer insights into potential temporal variations in noise levels.

It would be beneficial to consider the broader context of environmental factors and their influence on noise levels. Here are some suggestions:

- **Longitudinal Study Design:** A longitudinal study design that spans an extended period, capturing variations in noise levels across various times of the day and seasons. This would provide a more nuanced understanding of how noise patterns evolve and their potential impact on cognitive processes over time.
- **Multi-Modal Data Collection:** You could incorporate multi-modal data collection methods, combining noise measurements with additional parameters such as air quality, traffic patterns, and land use changes. This comprehensive approach could help identify potential correlations between environmental factors and cognitive outcomes.
- **Survey and Interviews:** Consider supplementing quantitative data with qualitative insights through surveys and interviews. Gather information from students, faculty, and residents in the vicinity to understand their perceptions of noise, its impact on learning, and potential sources of disturbance beyond the quantitative measurements.
- **Correlation with Academic Performance:** To establish a more direct link with cognition and learning, suggest correlating noise levels with academic performance data. Obtain consent to access anonymized student academic records and explore whether there is a correlation between noise exposure and variations in academic achievements.
- **Spatial Analysis:** Utilize spatial analysis techniques to examine the geographical distribution of noise sources and their proximity to academic buildings. This could shed light on specific areas within the university campuses that are more affected by noise, allowing for targeted interventions.
- **Collaboration with Experts:** If feasible, a collaboration with experts in acoustics or environmental science could refine your methodology. Their input could enhance the accuracy and reliability of the noise measurements, ensuring a more robust foundation for the study.

By adopting these suggestions, you can present a more comprehensive analysis of the impact of noise and acoustic over-exposure on cognition and learning, accounting for various environmental factors and potential correlations with the growth and development of the surrounding areas.

Here below, a couple of relevant sources on acoustic over-exposure in a similar context would contribute to the paper's

scholarly foundation:

Melese Mesene, Mengistu Meskele & Tamirat Mengistu (2022). The proliferation of noise pollution as an urban social problem in Wolaita Sodo city, Wolaita zone, Ethiopia, *Cogent Social Sciences*, 8:1, 2103280, doi: 10.1080/23311886.2022.2103280.

- **Focus:** The study explores the proliferation of noise pollution as an urban social problem in Wolaita Sodo city, Wolaita zone, Ethiopia.
- **Relevance:** This reference could be valuable in understanding how noise pollution is perceived as a social problem in an urban context. It may offer insights into the community's experiences and reactions to noise exposure.

Shukla, A., Tandel, B.N. (2024). Association of road traffic noise exposure and school childrens' cognition: A structural equation model approach, *Environmental Research*, Volume 240, Part 1, 117388, ISSN 0013-9351.  
<https://doi.org/10.1016/j.envres.2023.117388>

- **Focus:** Investigates the association between road traffic noise exposure and school children's cognition, utilizing a structural equation model approach.
- **Relevance:** This study is particularly relevant to your interest in the impact of noise on cognition. A structural equation model approach can provide a more intricate understanding of the relationships between variables, potentially offering insights into the cognitive effects of noise exposure on school children.

Xie, H., Kang, J., Tompsett, R. (2011). The impacts of environmental noise on the academic achievements of secondary school students in Greater London, *Applied Acoustics*, 72 (8), pp. 551-555  
<http://dx.doi.org/10.1016/j.apacoust.2010.10.013>

- **Focus:** Explores the impacts of environmental noise on the academic achievements of secondary school students in Greater London.

**Relevance:** This reference addresses the impact of noise on academic achievements, aligning with your interest in the potential effects of noise on learning outcomes. The findings may provide evidence of the connection between noise exposure and academic performance.