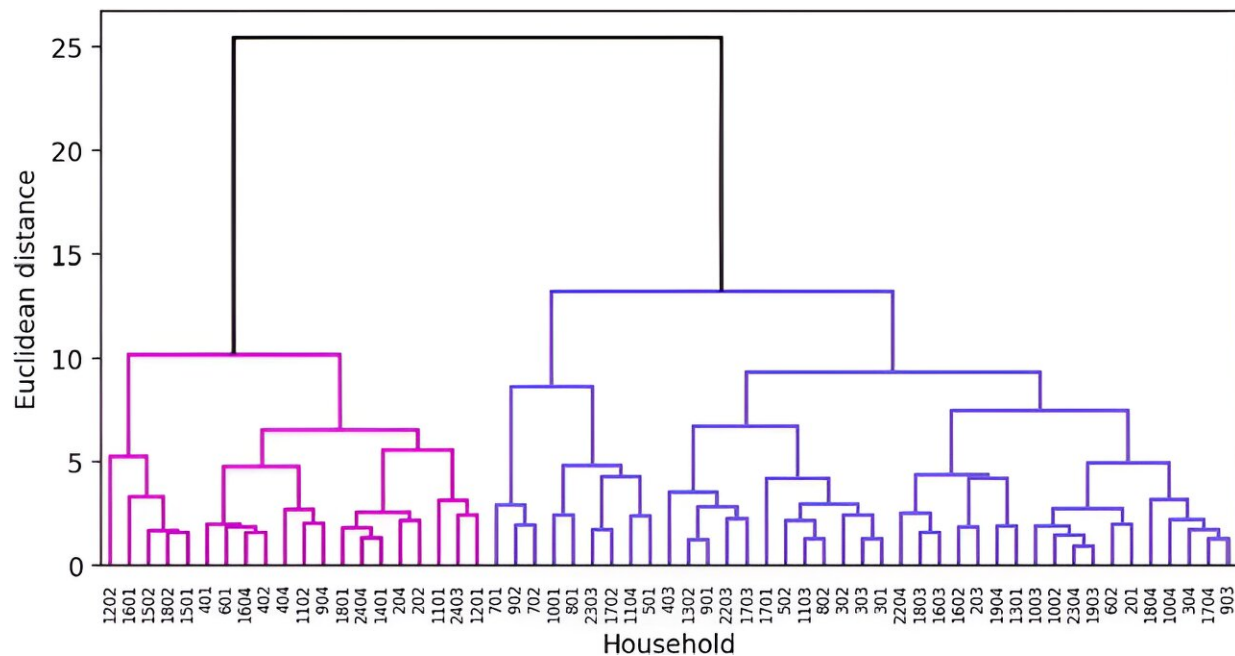


Discovery of a major factor causing deviation in apartment impact sound insulation

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The similarity (as determined by Euclidean distance) of household-specific heavy impact sounds was analyzed using hierarchical cluster analysis. A lower connection point for household lines indicates greater similarity in their impact sounds. Notably, households on the same floor tend to exhibit a higher degree of similarity. Credit: Korea Institute of Civil Engineering and Building Technology

Impact sounds, such as footsteps or items dropping from neighboring units, are particularly bothersome in apartment complexes. Such noises can invade one's personal space. In newly built apartments,

soundproofing structures like floating floors are employed to minimize these disturbances. The choice of materials and structural designs can significantly dampen sounds, resulting in a more peaceful living environment.

To gauge noise transmission within buildings, the heavy-weight impact sound is assessed. However, even within the same building and with identical layouts, variations in performance can arise when the same floating floor is used. Surprisingly, there has been a scarcity of scientifically documented cases explaining these performance discrepancies. This lack of data has led to an absence of consistent methods to manage and ensure performance uniformity.

Researchers in South Korea have shed light on the factors causing deviations in impact sound performance. The Korea Institute of Civil Engineering and Building Technology conducted on-site measurements to analyze the impact sound across different units within a building.

Through observation of the spatial distribution of heavy-weight floor impact sounds according to household location, it was discovered that the similarity of sounds in households on the same floor was higher than in those located on different floors. This phenomenon is likely attributed to households on the same floor sharing a consistent floor slab.

Dr. Shin said, "The Korean government implemented a policy in August 2022 to randomly sample and analyze 2% of total households based on their house plans. Recognizing the factors that influence heavy-weight impact sound will aid in selecting sample households for measurement. Moreover, for construction companies, this insight can serve as foundational data for designs that consider floor impact [sound](#)."

The conclusions drawn from this study are anticipated to provide a vital foundation for more effectively managing impact sounds in apartment

complexes.

The paper is [published](#) in the journal *Applied Acoustics*.

More information: Hye-kyung Shin et al, Spatial distribution of heavy-weight floor impact sounds according to the household location in a box-frame concrete building, *Applied Acoustics* (2023). [DOI: 10.1016/j.apacoust.2023.109214](#)

Provided by Korea Institute of Science and Technology

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