



Impact of Urban Building Configurations on Oppressiveness and Noise Annoyance in a High-Dense City

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The connections between sound perception and the visual environment in densely built urban settings have attracted a lot of attention in recent years. There is a concern among policymakers and practitioners in urban design about degeneration in cities and their regeneration brought about by new constructions of high-rises that have disrupted the pre-existing urban scale. In a spatially contested city such as Hong Kong, an open view has become ever more precious to dwellers. However, there is very limited understanding about the extent to which views of obstructing tall buildings at various spacing and distances affect the responses of noise annoyance and perceived oppressiveness. Furthermore, few studies explored the possibility of vertical greening and good façade upkeep in attenuating those responses. 53 participants in an experiment using immersive virtual reality gave annoyance and oppressiveness ratings to 16 simulated scenarios of an aging high-rise residential neighbourhood with spatial and façade attributes at road traffic noise levels between 55 and 65 dBA. Findings from multivariate models show that the probability of high noise annoyance responses could be significantly lowered with a larger separation distance, the presence of vertical greening, and refurbishment on building façades. In addition, decreasing noise level, increasing separation distance, presence of building spacing, vertical greening and refurbished building façades were likely to reduce oppressive feeling. Implicitly, the models suggested that people exposed to poorly maintained facades and blocked views would suffer from high oppressiveness and noise annoyance. These adverse impacts could be moderated if vertical greenery was placed on the facades of surrounding buildings.