Effects of the spatial variation of water-sounds sequences on the perception of traffic noise

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In the last decades, different researchers have shown the positive effects of informational masking (IM) on mitigating traffic noise perception and improving the local soundscape in urban parks. Most of these studies have tested various water sounds at different signal-to-noise ratios to optimize the selection and the sound levels to set the water sounds playback. However, less is known about the effects of the spatial distribution of water sounds on the perception of the surrounding environment. Three different water-sounds sequences, and one control condition with only traffic noise, were created and used in an online experiment to investigate the role of spatial variation of water-sounds sequences. The sequences include a frontal fixed-position water sound, a two-position switching water sound and a four-position randomized position water sounds. All of them were superimposed with a background traffic noise. Thirty-six subjects participated and answered an online questionnaire consisting of sets of items to describe the sound's perception and feeling. The Perceived Restorativeness Scale (PRS-11) was also administered. The results have shown that the introduction of water-sounds sequences improves some components of the restorative qualities (Fascination and Being-Away). Moreover, different spatial setting of water sound also changed people's perception and feelings in different aspects, including attractiveness, smoothness, mechanicalness, stimulation, and nervousness.