

Processing Salient Sounds in a Virtual Reality Soundscape

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Introduction

Prior research shows that emotional stimuli can either distract or enhance performance ^[1, 3]. Most studies focus on visual stimuli; less is known about auditory emotional stimuli. Emotional sounds are perceived more vividly and may enhance spatial abilities ^[2].

Our study aims to determine if emotional sounds enhance spatial abilities, particularly in identifying sound origin. This knowledge is crucial for fields requiring accurate spatial navigation in emotional contexts, such as aviation and 911 response.

Hypothesis

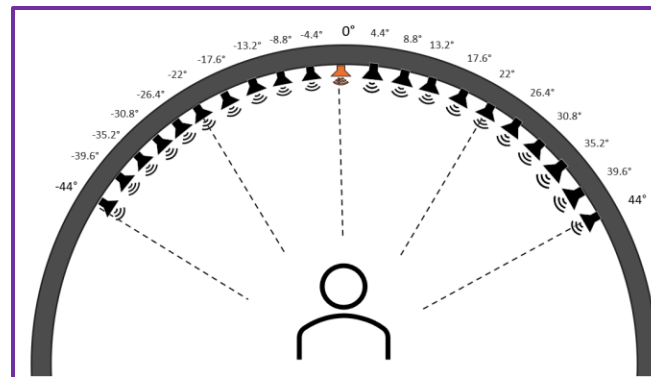


We hypothesize that emotional stimuli will improve sound localization in comparison to neutral sounds.

Methods

Participants will be blindfolded in the center of the **audiodome**; a spherical array of speakers. They will hear 40 different sounds, including everyday noises and emotionally negative sounds, from different horizontal and vertical locations. Using a device strapped to their hand, participants will point to the perceived location of each sound.

Participants will complete the State-Trait Anxiety Inventory (STAI), a questionnaire, to assess correlations with anxiety levels.



Measures & Analyses

Two measures will be assessed:

- **Localization Accuracy**
 - Deviation (in degrees) from the sounds' actual presented location.
- **Reaction Time**

We expect to see greater accuracy and faster reaction times when responding to emotional, compared to neutral sounds.

References

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2. Blair, K. S., Smith, B. W., Mitchell, D. G., Morton, J., Vythilingam, M., Pessoa, L., Fridberg, D., Zametkin, A., Sturman, D., Nelson, E. E., Drevets, W. C., Pine, D. S., Martin, A., & Blair, R. J. (2007). Modulation of emotion by cognition and cognition by emotion. *NeuroImage*, 35(1), 430–440. <https://doi.org/10.1016/j.neuroimage.2006.11.048>
3. Mitchell, D. G. V., Luo, Q., Mondillo, K., Vythilingam, M., Finger, E. C., & Blair, R. J. R. (2008). The interference of operant task performance by emotional distracters: an antagonistic relationship between the amygdala and frontoparietal cortices. *NeuroImage*, 40(2), 859–868. <https://doi.org/10.1016/j.neuroimage.2007.08.002>