Name That Tune
Musical Snippets as Reminders in the Home

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Motivation

Reminders are important in the home. Reminders can be used for appointments, medication, the status of household appliances and a good way to present such reminders and notifications is using audio. As the number of notifications and reminders that we receive increases, the number of distinct audio cues that we need for each increases as well. Such audio cues can either create a logical or abstract mapping between sound and object. However, studies have shown that people find abstract stimuli, such as Earcons, more difficult to learn or remember while stating a dislike for logical mappings such as speech or Auditory Icons.

Aims

The aim of this project was to empirically investigate the hypothesis that musical equivalents of Earcons and/or Auditory Icons might be a useful way to present reminder messages to people in a home environment. Musical memory is usually strong in people and can even be strong in people who suffer from memory and other cognitive function loss, as with conditions such as amnesia or Alzheimer's. If we could exploit the strong links between music and memory it seems possible that we could achieve the fast learnability of Auditory Icons coupled with the abstract nature of Earcons using musical snippets.

Methods

Three different lengths of musical snippet were created. Long snippets (1-2s), medium snippets (0.5s) and short snippets (0.2s). These snippets were created for four songs that were identified as musical 'memes' (the Friends theme, Pachelbel's Canon, Ghostbusters theme and the theme from Jurassic Park) and each song was mapped to a household task ('Lock your door', 'Remember your Keys', 'Take out the bin', 'Take your Medicine'). A speech cue was also generated for each of these tasks to use as a baseline for accuracy. The experiment would be split over two sessions, roughly a week apart, and consist of the following tasks:

1. First Session: An Association Game and recall task.
2. Second Session : (A Week Later) Recall Task

The association game was designed to highlight any existing associations the participant may have with the pieces of music. This will help determine the effect of the familiarity of the piece of music on the performance in the subsequent tasks.

After being given time to familiarise themselves with the mappings, participants were presented with a series of audio cues and asked to recall what household task the cue was associated with.

Results

Participants (N=12) performed well on the recall task. During the first round only ~3% of all notifications delivered were answered incorrectly.

Participants did not respond quicker to the shortest musical snippets than to the longest musical snippets or to speech.

However, participants responded significantly faster to the medium length snippets ($p < 0.01$). This reflected the general comments given by the participants after the test was over. In general, they felt that the long snippets were too long and the short snippets were too short.

These results were also reflected in the second round (N=11) of the experiment, showing that the response times for medium length snippets were significantly better.
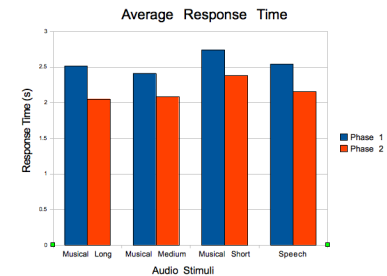
Conclusion

Overall, accuracy using the musical snippets was as high as the accuracy for speech, and the response times for the medium length musical snippets were significantly better than for speech. Interaction designers could use musical snippets to achieve the fast learnability and memorability of auditory icons and the abstract nature of earcons for audio reminders and notifications. Future work will investigate the effect of an increased number of notifications and personal choice of music on learnability and memorability.

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