

Effect of a reference vs. working memory task on verbal retrospective estimation of elapsed duration during music listening

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ABSTRACT

Background

Psychological time may be warped and shaped by musical engagement and variation, including factors such as the music's volume, tempo, arousal-inducing tendencies, and major vs. minor key (see e.g. 1, 2, and 4 below). Rather than experiencing music's large-scale structure as absolute, with sections and bars in relation to one another as experienced during the task of music analysis, the listener's phenomenological experience is shaped by varying and complex musical and extra-musical-factors. Along with musical characteristics, pre-occupation with a concurrent task, whether requiring retrieval from reference memory or rehearsal of information in working memory, may warp experience of elapsed duration during music listening.

Method

This paper presents data gathered during a nine-week residency at London's Science Museum, involving 866 museum participants. Two studies will be presented here, exploring both reference and working memory. Participants listened to a 37-second extract of a bespoke composition for solo piano (100bpm, E-flat major), and were retrospectively asked to verbally estimate elapsed duration of the listening period. Participants were matched for age, gender and musical experience.

Results

In study 1 (N = 50, 12 male, average age: 30.0), the average estimate for participants who listened only ('no task') was 52.00 seconds. Participants in condition 2 ('reference memory task'), who were instructed to write a list of jungle animals whilst listening, gave a not-significantly different average estimate of 55.88 seconds. However, in study 2 (N = 28, 12 male, average age: 25.5) the average estimate for participants who listened only ('no task') of 63.36 seconds was significantly longer ($p < 0.02$) than in the 'working memory task' group (instructed to rehearse a list of jungle animals whilst listening) which yielded an average estimate of 38.57 seconds.

Conclusions

These findings suggest that retrospective estimates of elapsed duration during music listening are not significantly shortened when a reference memory task is included, but are significantly reduced when working memory is occupied during the listening period. Results are discussed in terms of attention and memory. Diverting attention from the listening had a greater impact when

attention was focused on rehearsal in working memory, than on retrieval from reference memory. This study provides evidence that differing processes may underlie these systems, and that one diverts attention from music to a greater extent than the other.

Keywords

Psychological time, elapsed duration, music and time.

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