ACOUSTICS2008/2174
Unpredictable interruption can enhance the auditory continuity illusion

Maori Kobayashi[a] and Makio Kashino[b,c,d]
[a]R.I.E.C., Tohoku University, 2-1, Katahira, Aoba-ku, 980-8577 Sendai, Japan
[b]NTT Communication Science Laboratories, NTT Corporation, 3-1, Morinosato Wakamiya, 243-0198 Atsugi, Japan
[c]ERATO Shimojo Implicit Brain Function Project, JST, 3-1, Morinosato Wakamiya, 243-0198 Atsugi, Japan
[d]Tokyo Institute of Technology, 4259 Nagatsuta-cho, Midori-ku, 226-8502 Yokohama, Japan

It was examined whether the predictability of interruption timing affects the limit of perceiving the continuity illusion. The stimulus consisted of a 500-Hz sinusoidal inducee and a 200-ms, 500-Hz, 1/3-octave noise band inducer, which were alternated repeatedly, with a fixed interval (400 ms) between adjacent inducers (regular condition) or with random intervals (irregular condition). The continuity limit (CL) was measured in terms of the maximum level of the inducee for the illusory continuity to be perceived while maintaining the inducer level at 60 dB SPL. In Experiment 1, the listeners' task was to judge whether the inducee appeared continuous or discontinuous. In Experiment 2, the task was to discriminate illusory and physical continuity in a 2-interval forced choice paradigm. In both experiments, the mean CLs in the irregular condition were significantly higher than those in the regular condition. In Experiment 3, when an identical irregular interval pattern was used repeatedly in successive trials, the mean CL gradually declined, and reached the level of the regular condition in approximately 80 trials. These results suggest that unpredictability, not mere irregularity, in interruption timing promotes the continuity illusion, implying the involvement of the short-term plasticity of the auditory system.