

Perceptual deficits in audiovisual temporal integration in schizophrenia

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It has been suggested that individuals with schizophrenia (SZs) show impairment in temporal processing of multisensory information (de Gelder et al., 2002; Foucher et al., 2007). However, the source of the deficit has not been specified since multiple factors are intermingled in most of the previous studies. In the present study, we investigated whether SZs show perceptual impairment in temporal aspects of audiovisual integration compared to normal controls (NCs) by utilizing sound-induced flash illusion (SIFI). SIFI is a phenomenon in which single visual flash is perceived as double flashes when accompanied by double auditory beeps (Shams et al., 2000). By manipulating inter-stimulus interval (ISI) of those simple visual and auditory stimuli, we expected to scrutinize audiovisual temporal integration in SZs. Sixteen SZs and seventeen NCs participated in our study. A white disk subtending 2° was presented for 13ms at 5° below the fixation against black background on the monitor. The visual flash was accompanied by two beeps (10ms each) of which ISIs ranging from 80ms to 320ms. One beep was always presented simultaneously with the flash and the other preceded or followed the flash. Participants were asked to judge the number of perceived flashes. Results showed that proportion of perceived double flashes decreased with longer ISIs in both SZs and NCs. Notably, SZs' illusory perception of SIFI lasted with longer ISIs (over 200ms) unlike NCs reporting double flashes only in short ISIs. In addition, the degree of reduction in SIFI with longer ISIs was negatively correlated with PANSS Negative symptoms, showing that SZs with higher Negative symptoms scores tend to experience enduring SIFI even with greater temporal distances between the two beeps. These results suggest that SZs have differential patterns of audiovisual integration from those of NCs', which is presumably based on the perceptually lengthened temporal binding window.

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