

Front Hum Neurosci. 2010 Aug 19;4. pii: 59.

What Physiological Changes and Cerebral Traces Tell Us about Adhesion to Fiction During Theater-Watching?

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Source

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Abstract

Live theater is typically designed to alter the state of mind of the audience. Indeed, the perceptual inputs issuing from a live theatrical performance are intended to represent something else, and the actions, emphasized by the writing and staging, are the key prompting the adhesion of viewers to fiction, i.e., their belief that it is real. This phenomenon raises the issue of the cognitive processes governing access to a fictional reality during live theater and of their cerebral underpinnings. To get insight into the physiological substrates of adhesion we recreated the peculiar context of watching live drama in a functional magnetic resonance imaging (fMRI) experiment, with simultaneous recording of heart activity. The instants of adhesion were defined as the co-occurrence of theatrical events determined a priori by the stage director and the spectators' offline reports of moments when fiction acted as reality. These data served to specify, for each spectator, individual fMRI time-series, used in a random-effect group analysis to define the pattern of brain response to theatrical events. The changes in this pattern related to subjects' adhesion to fiction, were investigated using a region of interest analysis. The results showed that adhesion to theatrical events correlated with increased activity in the left BA47 and posterior superior temporal sulcus, together with a decrease in dynamic heart rate variability, leading us to discuss the hypothesis of subtle changes in the subjects' state of awareness, enabling them to mentally dissociate physical and mental (drama-viewing) experiences, to account for the phenomenon of adhesion to dramatic fiction.