

Effects of Head Motion on Structural and Functional MRI Studies

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In the past few years, several papers have come out emphasizing the deleterious effects of head motion during MRI scanning on imaging data and the research conclusions drawn from these data. Many of these papers have highlighted the effects of motion on resting state fMRI studies, while a few have shown that motion affects brain morphometry studies and studies using diffusion imaging. The emerging consensus seems to be that motion introduces a systematic bias in all of these modalities. Even small motions may introduce small biases, so that merely removing data obviously contaminated by motion may not suffice to eliminate bias. It also seems to be the case that the spurious effects of motion are similar to the physical effects (anatomical or functional changes) expected in the study group relative to the controls, and it is typically the study group that tends to exhibit relatively more motion. It is therefore critical that the community be aware of possible biases in studies, the methods available for dealing with motion, and areas in which methods developers can contribute by developing new ways to deal with the effects of motion in brain studies.

Impact of Motion on Diffusion-Weighted MRI

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Impact of Motion on Resting State fMRI and Functional Connectivity

Cameron Craddock, Child Mind Institute, New York, NY, United States and Nathan S. Kline Institute for Psychiatric Research, Orangeburg, NY, United States

Impact of Motion on Brain Morphometry Studies

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Prospective Motion-Correction Methods in MRI

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