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# Extending the Bayesian Causal Inference of Body Ownership Modell Across Time

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## Abstract

Bayesian Causal Inference (BCI) models multisensory perception as inference about two causal structures: either the sensory data stems from several separate causes or from a common cause. If the sensory evidence supports a common cause, the multimodal sensory input is integrated into a single percept. BCI has been applied to the rubber hand illusion, in which the subject integrates tactile stimulation with seen brush strokes on a rubber hand and experiences said hand as their own. A model of body ownership is relevant for virtual reality design, especially for strengthening avatar embodiment. In previous work, we have criticized the applied BCI model for its extraordinarily wide priors. Here we investigate whether the priors can be narrowed by increasing the sensory evidence. We try to accomplish this by extending the model across time. Preliminary results look encouraging, but further research, especially psychophysical experiments to inform the parameter choices, is needed.