

# DISSERTATION DEFENSE

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## **The Illusion of the Illusion of Control**

This dissertation is an exploration of people's estimates of control, with a particular focus on the illusion of control. Ellen Langer's 1975 article introduced the illusion of control as "an expectancy of a personal success probability inappropriately higher than the objective probability would warrant." Since her work, subsequent research has focused on factors, such as mood, intention, and connection to the outcomes that modify estimates of control, but little work has been done to investigate the process by which people estimate control. The studies presented here—six experimental and one simulation—address this gap.

My central question is: Are people's estimates of control accurate? The consideration of this question raises further questions that have not been deeply explored in the illusion of control literature. For example, how can we judge the accuracy of people's estimates of control? Are laypersons' definitions of control congruent with a normative standard for accuracy? What is the process by which people estimate control and can we model this? Can we extend our examination of control into domains where outcomes are not dichotomous?

I address the constancy of the illusion of control by examining how people estimate control in situations where their objective control is high. Two studies using a novel paradigm show that people under-estimate control when it is objectively high and over-estimate it when control is objectively low. A third study using a common illusion of control experimental design, the event-onset paradigm, replicates this finding. Together, these three studies question whether people have an innate bias towards believing they have more control than they really do.

But just how do people estimate control? To address this question, I develop a normative model for estimating control using a widely accepted normative measure of control. Based on the results of the first three studies, this model is simulated being used by a pool of perfectly Bayesian reasoners. The simulation results yields final estimates of control extremely similar to experimental estimates, indicating that this model accurately captures some of the process people use to estimate control. The simulation results are also statistically significant when compared to the objective amount of control in the simulation when frequentist (i.e. Fischer-Pearson) statistical tests are used. Significant results implies that these perfect Bayesian agents are inaccurate when judged by the standard statistical norms, yet Bayesian inference is widely accepted as a normative method of assimilating information! These results indicate a possibly serious methodological issue with many experimental paradigms that rely on standard statistical tests when measuring information learning.

Next, similar themes are pursued experimentally, when a novel method of eliciting estimates of contingency during an event-onset experiment and the participant responses afterwards demonstrate that, contrary to

conventional beliefs, people are quite accurate at estimating contingency (and performing information processing in a Bayesian manner), yet their estimates of control still follow the familiar pattern of results shown in the first three studies. This implies that participants' definitions of control are sharply at odds with the experimental normative measure of control. Thus, the illusion of control (and mis-estimates of control in general) might be experimental artefacts due to a failure to ensure that the concept of control is agreed upon by both experimenters and participants. A subsequent study replicates these results even when participants' estimates of contingency are not elicited during the experiment-and potentially less salient-and participants are free to sample as little or as long as they wish.

Finally, the examination of estimates of control is taken beyond the dichotomous realm of success or failure and into situations where outcomes can vary along a scale, for example, when a stock price goes up or down by a variable amount. The previous normative measure of control is extended into these domains and tested in an experimental setting when participants are able to evaluate their actions against the number of widgets produced in a factory. The results show again, that people are good at estimating contingencies, yet fail to incorporate them into a normative manner when asked to estimate control.

The results of the studies in this dissertation reveal that the illusion of control, along with mis-estimates of control in general, appears to be an illusion itself due to a lack of common understanding of how control should be calculated. These results are replicated across several different paradigms and appear to be robust. Additionally, these studies reveal methodological issues with previous work on the illusion of control and suggest that greater care needs to be taken when examining concepts whose measurement is not obvious. So are people's estimates of control accurate? My work shows that, yes, people are accurate when they estimate control, but only if you ask them properly.