Safe models for risky decisions
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In everyday life, we often have to decide between options that differ in their immediate and long-term consequences. Would you, for example, opt for a delicious piece of cake or rather eat a healthy apple? To investigate how people make risky decisions, this thesis focuses on the Iowa gambling task (IGT) and scrutinizes assumptions about the performance of healthy participants on the IGT. This thesis also challenges the trustworthiness of conclusions typically obtained from fitting reinforcement-learning models to IGT data. I argue that the risk of drawing premature conclusions from behavioral analyses and computational modeling can be minimized if researchers follow a number of crucial steps. These steps concern behavioral data analyses, model selection, model fitting, and assessment of absolute model fit. In particular, I advocate Bayesian techniques involving Bayesian repeated measures ANOVA for behavioral data analyses, the Bayes factor for model selection, the Bayesian hierarchical framework for model fitting, and posterior predictives to assess the absolute account of the models for the data at hand. Discussing a large variety of models and methods to compare the models, this dissertation illustrates that research efforts about risky decision making greatly advanced during the last years. On the other hand, this dissertation also illustrates the major challenges by pointing to problems with respect to behavioral analyses and cognitive modeling. Pursuing these suggestions will hopefully yield more reliable measures of risky decision making and a better understanding of the underlying psychological processes.

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Safe Models for Risky Decisions

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Für meine Eltern
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