

# Learning from a Black Box

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## Abstract

We study a decision maker's learning behavior when she receives recommendations from a black box, i.e., the decision maker does not understand how the recommendations are generated. We introduce four reasonable axioms and show that they cannot be satisfied simultaneously. We analyze various relaxations of the axioms. In one relaxation, we introduce and characterize an updating rule, the contraction rule, which has two parameters that map each recommendation to a recommended belief and the trustworthiness of the recommendation, respectively. The decision maker's posterior is formed by mixing her prior with the recommended belief according to the trustworthiness measure.

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