

Title: Persuading while Learning

Abstract: We introduce a dynamic persuasion model with a long-lived sender and a sequence of short-lived receivers. All players share a common prior belief about a persistent underlying state which is either good or bad. The sender gathers information over time and can commit to a dynamic revelation policy at the beginning. In each period, the sender privately receives a noisy signal about the state and reveals a potentially garbled signal to the short-lived receiver who arrives in this period. The short-lived receiver observes all information revealed by the seller in the past and updates her belief about the state being good. If her belief is above a fixed cutoff she acts; otherwise, she does not act. The sender would like to induce as many receivers to act as possible and values early actions more than later actions. We introduce a new class of Markov martingales, so-called “Blackwell martingale,” which have the property that the Blackwell information order is preserved by the associated probability kernel. All belief martingales generated by independent signals are Blackwell martingales. We prove that, for all signal structures that lead to Blackwell martingales, the optimal revelation policy must persuade the most concentrated set of beliefs surrounding the cutoff for action. We apply this characterization to show that if the sender is sufficiently impatient and receives information according to a random walk, then full transparency is optimal.

Joint work with Yakov Babichev, Dmitry Shaiderman, and Xianwen Shi