

Security games, Bayesian persuasion or contracting has motivated the study of sequential commitment games. In this talk, we study games in which a leader makes a single commitment, and then multiple followers (each with a different utility function) respond. In particular, we study ambiguous commitment strategies in these games, in which the leader may commit to a set of mixed strategies, and ambiguity-averse followers respond to maximize their worst-case utility over the set of leader strategies. We then develop a theory of ambiguous commitment in games with multiple followers. We begin by considering the case where the leader must make the same commitment against each follower. We establish that — unlike the case of a single follower — ambiguous commitment can improve the leader's utility by an unboundedly large factor, even when followers are permitted to respond with mixed strategies. This result holds even in simple zero-sum games. We go on to show an advantage for the leader coupling the same commitment across all followers, even when she has the ability to make a separate commitment to each follower. In particular, there exist general sum games in which the leader can enjoy an unboundedly large advantage by coupling her ambiguous commitment across multiple followers rather than committing against each individually. In zero-sum games we show there can be no such coupling advantage. The talk concludes with some remark on the computational aspect of optimizing the ambiguous commitment. The presented results are based on joint work with Natalie Collina and Aaron Roth.