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Observational and reinforcement pattern-learning: An exploratory study*

Nobuyuki Hanaki† Alan Kirman‡ Paul Pezanis-Christou§

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Abstract

Understanding how individuals learn in an unknown environment is an important problem in economics. We model and examine experimentally behavior in a very simple multi-armed bandit framework in which participants do not know the inter-temporal payoff structure. We propose a baseline reinforcement learning model that allows for pattern-recognition and change in the strategy space. We also analyse three augmented versions that accommodate observational learning from the actions and/or payoffs of another player. The models successfully reproduce the distributional properties of observed discovery times and total payoffs. Our study further shows that when one of the pair discovers the hidden pattern, observing another's actions and/or payoffs improves discovery time compared to the baseline case.

Keywords: multi-armed bandit, reinforcement learning, payoff patterns, observational learning

JEL Code: D81,D83

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