

**Activities**[Seminars](#)[International](#)[Conference](#)[Annual Retreat](#)[Student Seminar](#)[Academic Salon](#)[Brainstorming](#)**Seminars**[HOME](#) > [10112](#) > [Seminars](#)**Social cycling and conditional responses in the Rock-Paper-Scissors game****Haijun ZHOU**

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**Time:** 13:00pm, May.20, 2014**Address:** Rm. 101, Old Chemistry Building, east Wing, 1<sup>rd</sup> floor, CQB**Abstract:**

How humans make decisions in non-cooperative strategic interactions is a challenging question. For the fundamental model system of Rock-Paper-Scissors (RPS) game, classic game theory of infinite rationality predicts the Nash equilibrium (NE) state with every player randomizing her choices to avoid being exploited, while evolutionary game theory of bounded rationality in general predicts persistent cyclic motions, especially for finite populations. However, as empirical studies on human subjects have been relatively sparse, it is still a controversial issue as to which theoretical framework is more appropriate to describe decision making of human subjects. Here we observe population-level cyclic motions in a laboratory experiment of the discrete-time iterated RPS game under the traditional random pairwise-matching protocol. The cycling direction and frequency are not sensitive to the payoff parameter  $a$ . This collective behavior contradicts with the NE theory but it is quantitatively explained by a microscopic model of win-lose-tie conditional response without any adjustable parameter. Our theoretical calculations reveal that this new strategy may offer higher payoffs to individual players in comparison with the NEmixed strategy, suggesting that high social efficiency is achievable through optimized conditional response.

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