



Evolution of optimal Lévy-flight strategies in human mental searches

Filippo Radicchi, Andrea Baronchelli

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Recent analysis of empirical data [F. Radicchi, A. Baronchelli & L.A.N. Amaral. PLoS ONE 7, e029910 (2012)] showed that humans adopt Lévy flight strategies when exploring the bid space in on-line auctions. A game theoretical model proved that the observed Lévy exponents are nearly optimal, being close to the exponent value that guarantees the maximal economical return to players. Here, we rationalize these findings by adopting an evolutionary perspective. We show that a simple evolutionary process is able to account for the empirical measurements with the only assumption that the reproductive fitness of a player is proportional to her search ability. Contrarily to previous modeling, our approach describes the emergence of the observed exponent without resorting to any strong assumptions on the initial searching strategies. Our results generalize earlier research, and open novel questions in cognitive, behavioral and evolutionary sciences.

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