明治大学先端数理科学インスティテュート

第45回 MIMS Mathematical Biology Seminar

2013年11月19日(火) 14:30〜16:00
明治大学中野キャンパス822

Nov. 19, 2013. 14:30〜16:00　Meiji Univ. Nakano campus 822

JR中央線快速・総武線、東京メトロ東西線／中野駅 下車 北口より徒歩約8分

詳しくは、http://www.meiji.ac.jp/koho/campus_guide/nakano/access.htmlをご覧下さい.

Memory and cumulative culture

Mayuko Nakamaru (Tokyo Institute of Technology)

Evolution of learning is one of interesting research topics from the viewpoint of evolution and social sciences. The cognitive abilities are required to learn cultural traits. Take memory for instance. After we learn new cultural traits, we have to consolidate them. After keeping them in storage, memories should be retrieved. Otherwise, we can neither utilize the traits to improve our fitness or social lives, nor develop our cultural traits. However, many theoretical studies implicitly assume that humans are equipped with cognitive abilities to learn and utilize cultural traits perfectly because of simplifying the assumptions for mathematical models. We have to pay costs for having and utilizing cognitive abilities from the viewpoint of evolution. We have not known which cost is higher, memory or learning. If the memory cost is higher than the learning cost, it may be more efficient to forget the learned traits and learn them repeatedly than to keep them in storage according to the cost-benefit analysis. There may be some possible hypotheses to explain why human have the high cognitive ability of memory. I propose the cumulative cultural hypothesis: to develop cultural traits, it is necessary for us to have the high ability of memory even though it is costly. In this talk, to verify my hypothesis, I make a simple mathematical model of learning and memory, which assumes consolidation, storage and retrieval. Then we investigate how memory costs and a learning cost influence the evolution of cumulative culture. Then we discuss the Tasmanian effect based on my research outcomes.

参加自由です．皆様のお越しをお待ちしております．

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