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Herding and Information Cascade

S. Mori^a, M. Hisakado^b and T. Takahashi^c

^a*Department of Physics, Kitasato University*

^b*Standard and Poor's*

^c*Department of Behavioral Science, Hokkaido University*

We perform a sequential voting experiment to clarify how people decides based on others' choices. We gather 62 subjects and divide them into two groups and prepare two sequences of 31 subjects. The subject answers two-choice quiz sequentially with and without infomation of the summary statistics of the previous r subjects. We change r in $\{0, 1, 2, 3, 5, 7, 9, \infty\}$, where $r = 0$ means the answer without any information and $r = \infty$ means the answer with the information of all previous subjects. As the summary statistics, we use how many subjects among r choose choice 1(0) and denote it as C_1^r (resp. C_0^r). Fig.1 shows the distributions of the ratio of the correct answer for $r = 0$ and $r = \infty$. By observing others' choices, there occurs a drastic change and we see a two-peak structure in the latter case. We categorize the subjects into two classes –independent and herder. The subject in the former class knows the answer and the latter class means the subject who does not know the answer and can be affected by others' choice. We derive how the herder's probability of choosing one, we denote it as p_1 , depends on C_1 . Fig.2 shows the results for $r \in \{1, 5, 9, \infty\}$. Base on it, we introduce a stochastic model and study the possibility of the cascading transition [1].

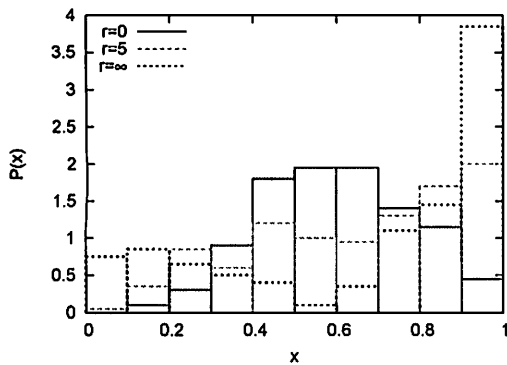


Figure 1: Plot of the distribution $P(x)$ of the ratio x of correct answer for $r = 0$ (red), 5 (green) and ∞ (blue).

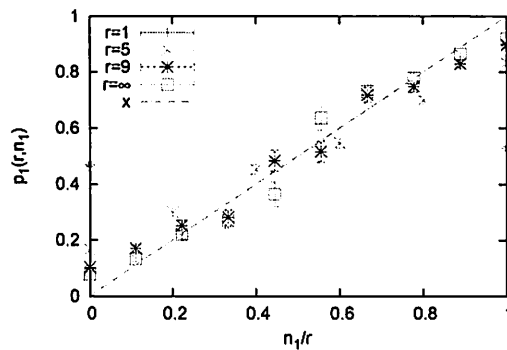


Figure 2: $p_1(r, n_1)$ vs n_1/r . We choose r as $r \in \{1, 5, 9, \infty\}$. We also plot $y = x$ to see fixed points.

References

- [1] M. Hisakado and S. Mori, *Digital herders and phase transition in a voting model*, J.Phys.A,Math.Theor.44(2011)275204.