

Abstract Submitted
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Opinion Dynamics on Networks with Inference of Unobservable States of Others¹ RYO FUJIE, Kanagawa University — In most opinion formation models which have been proposed, the agents decide their states (i.e. opinions) by referring to the states of others. However, the referred states of others are not necessarily observable and may be inferred. To investigate the effect of an inference of the states of others on opinion dynamics, I propose an extended voter model on networks where observable and referable node sets are different. These sets for a node defined as the nearest to the m_o -th neighbors for observable nodes and the nearest to the m_r -th neighbors for referable nodes. The state of referable but unobservable node which is the m -th neighbor ($m_o < m \leq m_r$) is inferred by using the observed or inferred states of the $(m-1)$ -th neighbors. In the case of $m_o = 1$ and $m_r = N$, I show analytically that the linear superposition of the states weighted by “betweenness pagerank” is conserved. This conserved quantity coincides with the fixation probability. On the other hand, in the case of $m_o = m_r = 1$, the model comes down to the standard voter model on networks and the conserved quantity is a degree-weighted superposition of the states. Thus, the introduction of the inference changes the important opinion spreaders from the high-degree nodes to the high-betweenness pagerank nodes.

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