

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Impact of Bursty Communication Patterns on Naming Game Competitions.¹ CASEY DOYLE, GYORGY KORNISS, BOLESŁAW SZYMANSKI, Rensselaer Polytech Inst — The currently dominant model of opinion spread dynamics chooses speakers randomly, giving rise to an exponentially distributed wait time between speaking events. Many studies, however, suggest that a more appropriate distribution would be a power law since it captures the bursty nature of communication^{2,3,4,5,6}. Here we study how adjusting the wait times for agents to speak to fit various distributions affects the dynamics of the naming game. Specifically, we show that by creating a system with competition between two groups (each with a different wait time distribution but the same mean), the symmetry of the system is broken and in the infinite system the 'burstier' community always wins. In contrast, when this burstiness is studied in the voter model, the symmetry breaking does not occur. Lastly, we show that burstiness in the naming game with committed agents shifts downwards the critical population required for consensus.

¹Supported in part by ARO, ARL NS-CTA, and ONR.

²J. Candia, M. Gonzalez, P. Wang et al., J. Phys. A, 41 22 (2008).

³J. Iribarren, E. Moro, PRL. 103, 038702 (2009).

⁴P. Van Mieghem, R. van de Bovenkamp, PRL 110, 108701 (2013).

⁵A. Vazquez, B. Racz, A. Lukacs et al., PRL 98, 158702 (2007).

⁶M. Karsai et al. PRE 83, 025102(R) (2011).

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Date submitted: 04 Nov 2015

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