**Title:** Testing for Network Effects in Field Experiments: Examples from Legislative Studies

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**Abstract:**

Most social processes involve complex interaction and dependence among units in a network. The [stable unit treatment value assumption](https://en.wikipedia.org/w/index.php?title=Stable_unit_treatment_value_assumption&action=edit&redlink=1) (SUTVA)--the assumption that a unit’s outcome is unaffected by other units’ treatment statuses—is required in conventional approaches to causal inference. When SUTVA is violated, as in networked social interaction, treatment effects spread to control units through the network structure. We evaluate the evidence for spillover effects in data from three field experiments on US state legislatures. Randomized field experiments represent the gold standard in causal inference when studying political elites. It is not possible to bring political elites into the lab, and causal identification with observational data is fraught with problems. We propose new specifications for treatment spillover models, and construct networks through geographical or ideological proximity and co-sponsorship. Considering different combinations of spillover models and networks, we evaluate the robustness of recently developed non-parametric tests for interference. The approaches we illustrate can be applied to any experimental setting in which interference is suspected.

**Keywords:** Causal inference, Networks, SUTVA, Randomized experiments, Political science, Permutation testing