

# The Effects of Shocks on International Networks: Changes in the Attributes of States and the Structure of International Alliance Networks

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We study the effects of shocks—such as major wars that change states’ strategic environments—on alliance networks. This has important implications for the structure of security cooperation networks. We develop an agent-based model (ABM) that: (1) models network evolution processes of security cooperation networks; (2) induces shocks that cause significant changes in agents’ utilities due to shifts in common interests between states; (3) analyzes how networks reorganize in the post-shock period. We derive propositions from the ABM about the relationship between shock attributes and network structure. We compare the results of the ABM to similar shocks that operate on real-world alliance networks. The ABM results with random network data suggest that states that experience dramatic changes in their strategic environment increase network connectivity and consistency. Consequently, post-shock networks become increasingly connected (denser) and consistent (transitive). With a few notable exceptions, these results are corroborated by analysis of alliance network reorganization following shocks. We discuss the theoretical and empirical implications of the results and offer directions for future research on shocks and international networks.