

# A Model of Tie Formation, Product Adoption, and Content Generation \*

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## Abstract

We study the co-evolution of individual users' friendship tie formations and their concurrent online activities (product adoptions and content generation) within an evolving online social network. By explicitly modeling the endogenous formation of the network and accounting for the interdependence between decisions in friendship formations and in concurrent online activities, we are able to discover important drivers underlying individuals' friendship decisions and, at the same time, to provide a clean identification of the resulting peer effects on individuals' actions. We estimate our model using a novel data set capturing the continuous development of a network and users' entire action histories within the network. Our results reveal that the total number of friends and the number of common friends a potential friend has with the focal user are the most important drivers of friendship formation. Further, while having more friends does not necessarily make a user more active, having more active friends does increase a user's activity levels in product adoptions and content generation through peer and spill-over effects. We assess the effectiveness of various seeding and stimulation strategies in increasing website traffic through prediction exercises. We find that seeding to users with the most friends is not always the best strategy to increase users' activity levels in an evolving network.

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