(Lane et al. 2020)

Lane, A. Kelly, Jacob D. McAlpin, Brittnee Earl, Stephanie Feola, Jennifer E. Lewis, Karl Mertens, Susan E. Shadle, et al. 2020. “Innovative Teaching Knowledge Stays with Users.” *Proceedings of the National Academy of Sciences of the United States of America* 117 (37): 22665–67. https://doi.org/https://doi.org/10.1073/pnas.2012372117.

Lane et al. (2020) explore the utilization of Evidence-based Instructional Practices (EBIPs) in college STEM courses. They study how the frequency of EBIPs use by instructors at academic institutions predicts ties in a communication network. Specifically, they examine whether educators who frequently use EBIPs engage in discussions with those less familiar with them, a factor critical for the diffusion of EBIPs across educational settings. The study utilized a survey employing Guttman scaling to assess faculty members' knowledge and use of EBIPs, ranging from awareness to regular application. Respondents were categorized into different levels based on their EBIP engagement, from “heard about EBIPs” to “use EBIPs all the time.” These levels were then transformed into ranked quartiles assigned as node attributes in their communication network. Using ERGMs, the researcher analyzed the likelihood of teaching discussion ties predicting EBIP usage discussions. The results indicated that low EBIP users were least likely to be cited as discussion partners by both high and low EBIP users. This lack of interaction suggests that the knowledge of EBIPs is unlikely to reach the less experienced educators through secondary diffusion processes.

I mirror this approach by assigning a quartile attribute based on the count of co-proposals. I aim to determine if researchers who frequently co-propose grants tend to collaborate with others with similar co-proposal activity. I explore the concept of homophily within these quartiles. This approach allows you to examine whether there is a tendency for high proposers to collaborate with other high proposers, which could indicate a "rich getting richer" phenomenon. Conversely, if high proposers frequently collaborate with low proposers, this might suggest a mentorship dynamic. The implications of these patterns are significant, potentially indicating disparities in resource distribution and opportunities within the scientific community.

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Notes:

Researchers used exponential random graph models (ERGMs) to estimate the likelihood of ties between pairs of faculty members with certain attribute scores.

The certain attributes scores came from

Faculty survey on evidence-based instructional practices (EBIPs) knowledge rated their knowledge of EBIPs on a Guttman scale. Participants were rated as either high or low EBIP users.

In the mapping change project, people answered a question about using these EBIPs or not on a 6-point Guttman scale. “Heard about EBIPs” (1), “use EBIPs all the time” (6) was the highest level. They turned these results into quartiles. The quartile is a node attribute. Used ERGMs to see how the tie of a teaching discussion tie predicted discussion use.

They picked the people from the highest quartile and the lowest quartile

People who are high EBIPs users predict speaking with other high EBIPs users but not low EBIP users. Low EBIP users does not predict speaking with High EBIP

[In CUPID, I created the quartile attribute using the count of proposals. I ask, do people who propose a lot propose with individuals who also propose frequently? I use the same ERGM method, using `nodemix()` to see if there is homophily in the high and low quartiles. This goes along with the question of mentorship in the network. Or whether

With the network treatment, does this change with the grand challenges?