831: A network's gender composition and communication pattern predict women's leadership success

Women are more likely to be placed into high level leadership positions if they are centrally located in their social network and have a female-dominated inner circle.

Focus Area: Economic Opportunity
Topics: Leadership
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Introduction:

Research has shown that the gender diversity of top leaders in an organization improves organizations' performance and workplace gender equality. Female leadership has been linked with lower levels of gender discrimination (Study 1(Beaman et al., 2009), Study 2(Dasgupta and Asgari, 2004)), supportive work-family balance policies, small gender pay and promotion gaps, and (in STEM fields) better retention of female employees. Thus, working to increase women's representation in leadership roles has a greater impact in closing the gender gap.

A growing avenue through which men and women enter leadership positions is through direct placement upon exiting graduate school programs. However, there is currently still little information about the effectiveness of these programs in placing men and women into leadership positions. Learning about open jobs through one's own social network, rather than through academic programs, has long been considered a successful way to seek and obtain leadership positions. Job seekers typically receive information about the job market from their social networks, including both public and private sources. Public information about the job market, such as publicly posted job openings, company reputations, and average salary trends, may come from what are known as someone's "weak ties" (i.e. a person's acquaintances). By contrast, private information about the job market, such as confidential information about an organization's unwritten rules and personalized advice how to navigate an organization, may come from what are known as someone's "strong ties" (i.e. a person's close friends).

This study examines the impact of the social networks of graduate students enrolled in the same leadership-training academic program on their eventual job placement, focusing on whether this differs based on gender.

Findings:

A student's examination scores, GPA, and work experience did not have a statistically significant impact on leadership job placement. This is likely because the students in the same graduate

program were already fairly equally qualified, however a student's social network is a strong predictor of their placement into leadership positions.

- Men are more likely to be placed into high level leadership positions if they are centrally located in their social network.
    - Men with network centrality in the top quartile have an expected job placement level that is 1.5 times greater than men in the bottom quartile.
    - A 10% increase in a man's network centrality yields approximately a 29% increase in their job placement level.
    - For men, neither their proportion of "strong" versus "weak" ties, nor the gender composition of their networks, have a statistically significant impact on their job placement level.
- In contrast to men, women are more likely to be placed into high level leadership positions if they both are centrally located in their social network *and* have a female-dominated inner circle.
    - Women whose network centrality is in the top quartile *and* have a female-dominated inner circle have an expected job placement level that is 2.5 times greater than women with low centrality and a male-dominated inner circle.
    - A 10% increase in a woman's network centrality yields approximately a 59% increase in their job placement level.
    - The more female-dominated and "stronger ties" within a woman's social network is, the higher their job placement.
    - 77% of high-placing women have a female dominated inner circle of contacts who are connected to many other nonoverlapping contacts. This breadth in social network is not seen in low-placing women or in high- or low-placing men ($p < 0.01$) and allows for to access novel job market information.
    - Women with networks similar to high-placing men (i.e. male-dominated and relatively weak ties with women) are low-placing, despite having leadership qualifications comparable to high-placing women.
- These patterns of leadership attainment do not differ in STEM versus non-STEM fields ($p = 0.943$ for men, and $p = 0.993$ for women), nor across different industries

Methodology:

In order to investigate the link between a student's graduate school social network and their placement into leadership positions post-graduation, researchers conducted a quasi-experiment using instrumental-variable regression. This study analyzed 4.55 million anonymized, content-free emails from 728 graduate students at a top-rate graduate program from the class of 2006 and 2007. The sample included approximately 74.5% men and 25.5% women. To substitute for "randomized" assignment in this study, researchers collected data based on the student's "home section" assignments, i.e. the random group they were sorted into (out of nine available groups) in their graduate program. These assignments equalized student characteristics, including gender, nationality, entrance-examination score, years of work experience, GPA, and

industry background. Using fixed-effects regressions, they found correlations between job attainment and student networks. Using instrumental variation (IV) regression and coarsened exact matching (CEM), they conducted causal inference tests. The statistical analysis examined the impact of three independent variables on the dependent variable, each student's "ranked job placement in leadership positions." The job ranking was measured using a ranked percentile score (0.0-100) that was determined by the graduate program and based on a position's salary, relative to its industry and region. The three independent variables were: the centrality of a student's network (measured using Pagerank), the degree of equality in their communication (measured using Shannon entropy, in which high communication equality pointed to the presence of a "strong tie" and low communication equality pointed to the presence of a "weak tie"), and the degree of gender homophily (the student's proportion of same-sex contacts.

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