

How Education Within Social Networks Shape Perceived Barriers to Applying to Graduate Mathematics Programs

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Students rely on information from their social networks to navigate decisions about college and career-related choices (Canché et al., 2014). Beyond undergraduate education, enrollment in graduate programs is heavily influenced by a student's parent's level of education (Bryer, 2025; Mullen et al., 2003; Seay et al., 2011). The theory of social capital suggests that students learn information, norms, values, standards, and expectations for education from their family, peers, and others with whom they may form inter-personal relationships (Coleman, 1988). We use this framework to discuss our results. The following data was collected from 519 survey responses to a 57-question survey investigating student knowledge about applying to graduate school in mathematics. The following table shows selected results from one survey item about application barriers compared to the survey item: "What is the highest level of education completed by someone in your network (friends/extended family)?" We use the term "First-Generation" to describe students whose social network contains less than a bachelor's degree. Using Kruskal-Wallis tests we found there was an association where students whose social networks had people with post-secondary degrees were less likely to view obtaining letters of recommendation and relocating as potential barriers to applying to graduate school. When navigating the college application process, student peer groups provide knowledge which ultimately makes applying to college more accessible (Tierney & Venegas, 2006). Students who know someone with a graduate degree, can rely on them and/or their social network to know how to obtain proper letters of recommendation or prepare to relocate for graduate school. Thus, these students may find it easier to apply to graduate school compared to their peers due to their social capital.

Table 1. Kruskal-Wallis test results for selected items for the question "To what extent are the following factors a potential barrier to your pursuit of graduate school?" using the level of education of social network variable.

Item	Group	N	Mean	Mean Rank	H	Df	P	η^2
Obtaining letters of recommendation	First-Gen	44	3.07	323.69	12.508	2	.002	.024
	Bachelor's	122	2.56	265.92				
	Graduate	346	2.36	243.07				
Possibly having to move to a new place	First-Gen	44	3.41	324.30	17.401	2	<.001	.034
	Bachelor's	122	2.93	277.22				
	Graduate	344	2.57	238.97				

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