

Degrees of Access: The Role of Family Education in Knowledge of Applying to Graduate School

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An important factor in attaining a graduate degree in mathematics is an applicant's familiarity with the graduate school application process—a form of knowledge that is not always formally taught but instead passed through familial networks. Research shows that first-generation college students frequently encounter unique challenges in navigating higher education, including limited access to guidance, financial barriers, and unfamiliarity with academic systems (Cragg, 2009; Davis, 2010; Engle & Tinto, 2008; Holley & Gardener, 2012; Pascarella et al., 2004). We apply the theory of social capital to explore how family members influence first-generation students' understanding of the graduate school application process (Coleman, 1988). This study surveys 519 undergraduate mathematics students across 181 institutions to examine how the highest level of education attained by an immediate family member impacts familiarity with the graduate application process. A Chi-squared test found that participants with family members who have a bachelor's degree or higher were more likely to report familiarity with the application fee waivers and that doctoral programs do not always require a master's degree. This finding reinforces the theoretical framework of social capital, which holds that educational knowledge is often passed down informally through familial and relational networks. This allows some applicants to navigate the admissions process with greater confidence and insight, while others are left to figure it out alone. These findings highlight the need for early advising on the norms of graduate school in mathematics, transparent funding guidance, and mentorship programs to support first-generation students.

Table 1. Chi-squared test results for selected items for the question, "Please rate your familiarity with the following concepts about the graduate school application process."

Item	Education level	Never heard this before	May have heard this before	Definitely heard this before	Values	<i>p</i>	<i>w</i>
Some programs offer ways to reduce or eliminate application fees	First-Gen	24	43	36	15.631	.004	0.17
	Bachelors	43	49	53			
	Graduate	36	72	133			
Some doctoral programs do not require applicants to get a master's degree first	First-Gen	37	28	38	24.382	<.001	0.22
	Bachelors	28	27	67			
	Graduate	38	50	160			

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References

- Coleman, J. S. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology*, 94(1), S95–S120. <http://www.jstor.org/stable/2780243>
- Cragg, K. M. (2009). Influencing the probability for graduation at four-year institutions: A multi-model analysis. *Research in Higher Education*, 50, 394-413. doi:10.1007/s11162-009-9122-2
- Davis, J. (2010). The first-generation student experience: Implications for campus practice, and strategies for improving persistence and success. Sterling, VA: Stylus.
- Engle, J., & Tinto, V. (2008). Moving beyond access: College success for low-income, first-generation students. *Washington, DC: The Pell Institute*.
- Holley, K. A., & Gardner, S. (2012). Navigating the pipeline: How socio-cultural influences impact first-generation doctoral students. *Journal of Diversity in Higher Education*, 5(2), 112.
- Pascarella, E. T., Pierson, C. T., Wolniak, G. C. and Terenzini, P. T. 2004. First-generation college students: Additional evidence on college experiences and outcomes. *The Journal of Higher Education*, 75(3): 249 – 284, DOI: 10.1080/00221546.2004.11772256