



The effects of perceived mentor support and mentoring functions in shaping undergraduate research opportunities: How mentors impact student outcomes

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Abstract

- This study explores the interplay between formal (e.g., faculty mentoring) and informal (e.g., social support) mentoring structures
- Examines how the dimensions of informal social support are related to formal faculty mentoring functions, and how the dimensions of social support relate to cumulative grade point average (GPA) and intended major
- Secondary data analyses of self-report undergraduate research program students
- Results indicate that, in general, informal support had an inverse relationship with formal faculty mentoring
- Implications for URE programs about the trade-off between informal and formal mentoring structures

Introduction

- Previous literature has explored formal and informal mentoring frameworks and their individual connections to various outcomes, such as academic performance and confidence (Aikens et al., 2017) but not how they interplay
- This study utilizes strengths-based approach to evaluate undergraduate research experiences (UREs). In lieu of traditional deficit based approaches
- First, faculty mentoring offers a more formal framework composed of 3 functions (i.e., educational, psychosocial, and instrumental)
- Second, 3 support modes (i.e., emotional support, practical assistance, and advice and guidance) together form the social support mentoring framework
- Formal mentoring is connected to informal mentoring when the mentor-mentee match is strong, but less connected when the match is weak (Chao et al., 1992)

Methods

- Secondary data analysis
 - Data from Diversity Research Policy Program's (DRPP) longitudinal study of students participating in Undergraduate Research Opportunity Program (UROP)
 - During the 2011-2012 academic year

Measure name	Description	Response scale
Strong Faculty Mentoring Support scale (SFMS)	Perceptions of faculty mentoring behaviors (time 3)	4-point Likert scale: 1 strong disagreement, 4 is strong agreement
Social Support Behaviors scale (SS-B)	Perceptions of social support behaviors (time 3)	4-point Likert scale: 1 strong disagreement, 4 is strong agreement
GPA	Self-reported cumulative undergraduate GPA (time 4)	0.0 to 4.0
Students' intended major	Self-reported intended major (time 1)	STEM, non-STEM, undecided

Participants Demographic Makeup

Characteristics	Category	N (%)
Sex	Male	102 (36.6%)
	Female	177 (63.4%)
Ethnicity	African American	8 (2.9%)
	American Indian or Alaskan Native	1 (0.4%)
	Asian American	60 (21.5%)
	Native Hawaiian or Other Pacific Islander	1 (0.4%)
	White, Caucasian	186 (66.7%)
	Other	20 (7.2%)
	No Response	3 (1.1%)
College Major	STEM	130 (46.6%)
	Non-STEM	59 (21.1%)
	Undecided	78 (28.0%)
	No Response	12 (4.3%)

Results

Correlations between measures

Measure	Average faculty mentoring functions	Time 4 GPA
Average social supportive behaviors	-0.57**	-0.12

Note: * p < 0.05; ** p < 0.01 level

Correlations between individual social support modes and individual faculty mentoring functions

Measure	1	2	3	4	5
1. Emotional support	-				
2. Practical assistance	0.86**	-			
3. Advice and guidance	0.82**	0.80**	-		
4. Educational mentoring	-0.44**	-0.34**	-0.41**	-	
5. Instrumental mentoring	-0.46**	-0.40**	-0.37**	0.61**	-
6. Psychosocial mentoring	-0.58**	-0.50**	-0.59**	0.71**	0.55**

Note: * p < 0.05; ** p < 0.01 level

Discussion

- One-Way ANOVA on majors and the SS-B was insignificant. There was **no difference between the majors** $F(2, 161) = 0.82, p = 0.44$)
- As students reported that they **perceived higher social supportive behaviors** from their mentors, they tended to report **lower faculty mentoring ties**
- In general, as **perceptions of informal mentoring increased, perceptions of formal mentoring decreased**
- Potential explanation - the dichotomy between informal and formal mentoring relationships (Chao et al., 1992)
 - Increased mentee awareness of mentor personal beliefs and motivations (e.g., informal) → better navigation of relationship hierarchy
- **Implications:** awareness of the trade-offs between formal and informal mentoring can potentially allow URE mentors and program coordinators to create **more beneficial URE programs by:**
 - 1) Encouraging graduate or doctoral students who work alongside undergraduate researchers to develop informal mentoring relationships
 - 2) Simultaneously encouraging formal mentoring relationships between undergraduates and lead faculty
- **Limitation:** inability to fully analyse the **impacts of social support on academic trajectories** because:
 - 1) Intended major was recorded prior to participation
 - 2) GPA data is limited in scope

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