The Chronicle of Mentoring & Coaching

The Chronicle of Mentoring and Coaching,
2025, Vol. 9, No. 3
doi.org/10.62935/s2405p

Impact of Faculty Mentor Development Intervention on Mentees' Subjective Career Success

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By improving mentoring competency, mentor development interventions help address the shortage of faculty mentors, the greatest obstacle to developmental network growth. Recent data indicate that mentor development interventions do not enhance mentees' objectively measured scholarly productivity. This may be because longer-term follow-up is needed to assess this outcome, highlighting the importance of using an outcome more sensitive to short-term change. This study examines the impact of a mentor development intervention on mentees' Subjective Career Success Inventory (SCSI) assessment. In a randomized controlled trial, the outcomes for mentees whose faculty mentors participated in a combined asynchronous and synchronous mentor development program (intervention group) were compared to the outcomes for mentees whose faculty mentors participated in an asynchronous program alone (control group). Mentor-mentee dyads (N=91) from four Southwest and Mountain-West institutions were recruited. Mentees' perceived career success was assessed at baseline, 12 months, and 24 months using the 24-item, eight-dimension Shockley's SCSI scale. The repeated measures analysis included the study period times intervention interaction, which was the test of the intervention's effect. At 12 months, the increase in mentees' self-reported SCSI scores from baseline was significantly greater in the intervention group compared to the control group (interaction p=.048). Specifically, the intervention group showed a greater increase from baseline to 12 months for SCSI dimensions of meaningful work, influence, authenticity, and growth and development (all p<.05). By demonstrating the impact of mentor development intervention on mentees' perceived career success, the study strengthens the intervention's value as an institutional investment for enhancing faculty developmental networks.

Keywords: Developmental network, faculty mentoring, Subjective Career Success Inventory (SCSI), mentor competency

Acknowledgements: NIH/NIGMS U01GM132175 (Sood, PI) and U54GM104944 (Sy, PI); HRSA D34HP45723 (PI Romero-Leggott); and NIH/NCATS UL1TR001449 (Pandhi/Campen, PIs) funded the study.

Introduction

Access to mentoring is the most important facilitator for faculty success, while mentor shortage is the greatest obstacle to developmental network growth (Ransdell et al., 2021). Effective faculty mentoring at academic health centers requires well-prepared mentors who provide career and psychosocial support to mentees. Mentor development has recently gained organizational attention, being cited by faculty as the most important component of an organization's mentoring climate (Tigges et al., 2020). Limited data indicate that competency-based structured faculty mentor development intervention improves mentors' self-reported mentoring competency, with sustained improvement for up to 24 months (Pfund et al., 2014; Sood et al., 2024; Sood et al., 2020). Consequently, mentor development programs may elevate the quality of mentoring, creating a sustainable and effective mentoring community (Pololi et al., 2015). While mentoring programs are associated with numerous positive outcomes for mentees, less is known about the impact of faculty mentor development programs on mentees' outcomes, constituting a critical gap in the literature. A recent study indicates that a mentor development intervention did not significantly increase the number of faculty mentees' publications, presentations, or awarded grants within the assessed 12- and 24-month timeframes (Shore et al., 2024). However, the

impact of a mentor development intervention on broader and more encompassing subjective mentee career success outcomes has not been previously studied.

Literature Review

Career success, defined as the accomplishment of desirable work-related outcomes at any point in a person's work experiences over time (Arthur et al., 2005), is a primary focus of both mentees and organizational stakeholders (Shockley et al., 2016). Historically, career success has been conceptualized and measured objectively, primarily through metrics such as salary, rank, or number of promotions. However, the changing nature of work has also necessitated a change in the way many mentees view career success, adding a more subjective component. Although various items may be used to represent subjective career success, the most common representation is satisfaction regarding progress toward personal career goals (Zhou et al., 2015). The multidimensional subjective definition of career success allows us to consider work-related experiences in contemporary society, where individuals are becoming less bound to a single organization. Likewise, it does not limit the career to upward advancement or only professional occupations (Shockley et al., 2016). The study used the multidimensional Shockley's Subjective Career Success Inventory (SCSI). The SCSI includes 24 items that address subjective career success via eight dimensions, which include the following: recognition, quality work, meaningful work, influence, authenticity, personal life, growth and development, and satisfaction.

The scale was developed and validated through four phases of data collection, beginning with interviews and focus groups, which were followed by item sorting tasks, then item refinement through confirmat ory factor analysis, and finally convergent and discriminant validity quantitative analysis (Shockley et al., 2016). The objective of the study was to determine the effectiveness of a faculty mentor development intervention on faculty mentees' subjective career success outcomes. Such evidence could prioritize mentor development initiatives and justify resource allocation, bolstering institutional support for these programs.

Methods

Study Theoretical Framework

The Social Cognitive Theory provided the theoretical framework for the study. The theory was developed based on research by Albert Bandura who observed that human behavior is shaped by a dynamic, reciprocal model involving the continuous interaction of personal factors, environmental influences, and behaviors. A basic premise of the theory is that people learn not only through their personal experiences but also by observing the actions of others and the consequences of those actions (Bandura, 1986). Such observational learning may help mentors build mentoring competencies and help mentees make the most of their mentors.

Study Design and Sample

This randomized controlled trial compared the subjective career success of mentees whose faculty mentors participated in a combined online asynchronous and virtual synchronous mentor development program (intervention group) with that of mentees whose faculty mentors participated in an online program alone (control group). Faculty mentor-mentee dyads were recruited from four Southwest and Mountain West institutions, including the University of New Mexico's Central and Health Sciences campuses, Arizona State University, the University of Oklahoma Health Sciences Center, and Mountain West Clinical & Translational Research Infrastructure Network institutions. Dyads were randomly assigned to intervention and control groups using a computer-generated, stratified block randomization method. Faculty mentors and mentees were recruited for this trial without preselection based on their research skills, rank, or track.

The outcome variable, faculty mentees' self-reported subjective career success was measured using the multidimensional Shockley's Subjective Career Success Inventory (SCSI) (Shockley et al., 2016). Mentees' subjective career success was self-reported in our trial at baseline, 12 months, and 24 months, using the SCSI, electronically administered via a REDCap database, with a comparison between baseline and 12 months as the study's primary endpoint. REDCap is a secure web-based application for building and managing online surveys and databases hosted by the University of New Mexico Health Sciences Center (Harris et al., 2009).

The predictor variable was the type of mentor development program; the intervention mentors participated in a combined online asynchronous and virtual synchronous mentor development program. In contrast, the control mentors participated in an online program alone. Details of these programs have been previously published (Sood et al., 2020). Both asynchronous and synchronous programs include the following eight modules: Defining Mentoring from the Beginning, Rewards and Challenges of Mentoring, Communicating Effectively with Mentees, Achieving Work-Life Balance, Understanding Diversity Among Mentees, Benefits of Formal Mentoring and Informal Mentoring Relationships, Leadership Skills and Opportunities – How to Build a Research Team, and Helping Mentees Get and Manage External Funding. The synchronous training additionally used 8 hours of interactive real-life case discussions guided by expert facilitators, based on the online asynchronous

reading materials.

Analytic Techniques

Descriptive characteristics of faculty mentees at baseline, including the institution of work, faculty track status, age, race/ethnicity, underrepresented minority (URM) status, gender, rank, and degree were compared using Chi-squared tests. For the main intervention test, linear mixed models were used to account for repeated measures within the mentee. Analysis models included predictor variables for the intervention group, study period, and the study period times intervention interaction, which was the test of the intervention's effect.

The coding of predictor variables yielded tests for whether the change from baseline to 12 months and to 24 months was different for intervention and control groups. A p-value < .05 was considered statistically significant. Institutional Review Board (IRB) approval was obtained (UNM HRPO 19-464).

The study was planned assuming 150 mentees in each study arm with a priori 80% power to detect a difference of 0.33 for a cross-sectional comparison at 12 months. The study, however, fell short of its recruitment goal and the planned sample size could not be achieved due to the COVID-19 pandemic.

Results

A total of 94 faculty mentees participated in the study and were followed for up to 24 months; 50 mentees participated in the intervention, while 44 were controls. Descriptive characteristics of mentees at baseline showed no significant differences between the two randomized groups (Table 1)

Table 1

Characteristic	Control n=44		Intervention n=50		p-value
	n	(%)	*n*	(%)	
Site					
Arizona State University	7	15.91	8	16.00	.74
Mountain West Clinical Translational Research Infrastructure Network	7	15.91	9	18.00	
University of Oklahoma Health Sciences Center	16	36.36	14	28.00	
University of New Mexico Central Campus	7	15.91	6	12.00	
University of New Mexico Health Sciences Center	7	15.91	13	26.00	
Faculty Track					
Missing	2	4.55	2	4.00	.93
Tenured	3	6.82	2	4.00	
Tenure Track	12	27.27	14	28.00	
Clinician Educator Track	16	36.36	18	36.00	
Lecturer/Instructor Track	9	20.45	3	6.00	
Research Track	1	2.27	2	4.00	
Flex Track[1]	0	0.00	3	6.00	
Other	1	2.27	6	12.00	
Age (in years)					
Missing	2	4.55	2	4.00	.57
Age under 40	21	47.73	22	44.00	
Age 40-59	19	43.18	23	46.00	
Age 60-74	1	2.27	3	6.00	
Age 75 or older	1	2.27	0	0.00	
Race/Ethnicity					
American Indian or Alaska Native	0	0.00	3	6.00	.92
Black or African-American	1	2.27	2	4.00	
Asian	8	18.18	10	20.00	
Middle Eastern or North African	1	2.27	0	0.00	
Hispanic, Latinx, or Spanish origin	5	11.36	4	8.00	
Non-Hispanic White	27	61.36	29	58.00	
Some other	2	4.55	2	4.00	
Racial/Ethnic URM faculty[2]					
Missing	2	4.55	2	4.00	.84
Non-Underrepresented Minority	36	81.82	39	78.00	
Underrepresented Minority	6	13.64	9	18.00	
Gender					
Missing	1	2.27	2	4.00	.26
Male	17	38.64	14	28.00	
Female	25	56.82	34	68.00	
Transgender	1	2.27	0	0.00	
Rank					
Missing	2	4.55	2	4.00	.81
Assistant Professor	30	68.18	38	76.00	
Associate Professor	6	13.64	4	8.00	
Instructor, Lecturer, Other	6	13.64	6	12.00	
Degree					
Missing	2	4.55	2	4.00	.75
Doctoral/Postdoctoral	35	79.55	37	74.00	
Masters	7	15.91	11	22.00	

Descriptive Characteristics of Mentees at Baseline
Flex tracks are given a few years to decide whether to go to the tenure track or stay in a clinical track. [2] An underrepresented minority (URM) was defined as any participant who self-identified as African American or Black, Hispanic or Latino, American Indians or Alaska Natives, Native Hawaiians or other Pacific Islanders.

At 12 months, the increase in mentees' self-reported global SCSI scores from baseline was significantly greater in the intervention than in the control group (interaction p = .048, Table 2). Specifically, the intervention group showed a greater increase from baseline to 12 months for the SCSI dimensions of meaningful work, influence, authenticity, and growth and development (all p <.05). Additionally, there was a trend toward the intervention group showing a greater increase from baseline to 12 months for the SCSI dimension of quality work (interaction p = .06). These effect sizes of statistical significance are of moderate strength.

Table 2.
Change from baseline for SCSI global and dimension scores for Intervention and Control groups estimated by linear mixed model analysis. Interaction rows test whether change is the same for Intervention & Control, i.e., [Intervention - Control] = 0

Inventory or Dimension [1]	Comparison Group	12 Months (n=74)			24 Months (n=61)		
		Estimate	*SE*	*p*-value	Estimate	*SE*	*p*-value
SCSI (Global)	Intervention	0.30	0.11	**.008**	0.09	0.13	.48
	Control	-0.03	0.12	.80	-0.24	0.17	.15
	Interaction	0.33	0.17	**.048**	0.34	0.21	.12
Recognition Dimension	Intervention	0.30	0.14	**.04**	0.18	0.17	.27
	Control	0.14	0.15	.36	-0.18	0.21	38
	Interaction	0.16	0.21	.46	0.37	0.26	.17
Quality Work Dimension	Intervention	0.39	0.13	**.004**	0.30	0.16	*.06*
	Control	0.01	0.15	.94	-0.27	0.20	.17
	Interaction	0.38	0.20	*.06*	0.57	0.25	**.02**
Meaningful Work Dimension	Intervention	0.28	0.13	**.04**	0.18	0.15	.25
	Control	-0.12	0.14	.42	-0.14	0.19	.48
	Interaction	0.40	0.19	**.04**	0.31	0.25	.21
Influence Dimension	Intervention	0.48	0.15	**.001**	0.12	0.18	.49
	Control	-0.03	0.16	.87	-0.33	0.22	.14
	Interaction	0.51	0.22	**.02**	0.46	0.29	.11
Authenticity Dimension	Intervention	0.32	0.14	**.03**	0.03	0.17	.86
	Control	-0.16	0.15	.32	-0.52	0.21	**.01**
	Interaction	0.48	0.21	**.03**	0.55	0.27	**.04**
Personal Life Dimension	Intervention	0.20	0.13	.14	-0.13	0.16	.41
	Control	0.05	0.14	.74	-0.10	0.20	.62
	Interaction	0.15	0.20	.45	-0.03	0.25	.90
Growth & Development Dimension	Intervention	0.27	0.12	**.03**	0.07	0.14	.62
	Control	-0.01	0.13	.96	-0.02	0.18	.92
	Interaction	0.28	0.18	.12	0.09	0.23	.70
Satisfaction Dimension	Intervention	0.14	0.15	.38	-0.06	0.18	.73
	Control	-0.15	0.17	.36	-0.34	0.22	.14
	Interaction	0.29	0.23	.21	0.27	0.29	.34

1 SCSI = Subjective Career Success Inventory (Shockley et al., 2016); SE = standard error.

[1] SCSI = Subjective Career Success Inventory (Shockley et al., 2016); SE = standard error.

Discussion

The findings of this randomized controlled trial indicate that the mentor development intervention that involved a combined online asynchronous and virtual synchronous program, as compared to the online asynchronous mentor development program alone, was associated with a greater increase from baseline to 12 months in mentees' self-reported global SCSI scores and dimensions of meaningful work, influence, authenticity, and growth and development. This study contributes to understanding the short-term effects of faculty mentor development programs on mentees' perceived career success. This study also demonstrates that theoretically guided observational learning by mentors have beneficial effects on mentees.

In a systematic review, Beech et al. (2013) reported significant improvements in career satisfaction among minority faculty involved in tailored mentoring programs but did not analyze the impact of mentor development interventions on mentees. On the other hand, a recent randomized controlled trial indicated that the mentor development intervention did not significantly enhance faculty mentees' scholarly productivity, as assessed by the number of mentees' publications, presentations, or grants awarded, within the assessed 12 and 24 month timeframes (Shore et al., 2024). Distinct from the multidimensional perceived career success outcome, mentees' scholarly productivity may need a relatively longer latent period than 24 months to demonstrate improvement and may not adequately measure career success for non-tenure and non-research track faculty mentees enrolled. Clinician-educators or lecturers, accounting for the majority of the faculty mentees in our study, may not have a significant increase in their presentations, publications, or grants due to their substantial clinical responsibilities or teaching commitments, respectively (Files et al., 2008). On the other hand, mentee career benefits may be better assessed by the SCSI, a holistic subjective measure, possibly more sensitive to intervention than a traditional objective measure, further highlighting the importance of considering the objective–subjective duality when assessing career growth (Shockley et al., 2016). An additional explanation for the inability to demonstrate an improvement in some outcomes but not others may be that we compared the intervention arm to a control arm that received some training, as opposed to no training; the latter occurred in the Pfund study (2014). The effect of this "contamination" is to make the control arm more similar to the intervention arm, i.e., to dilute the intervention contrast, biasing the effect of the intervention (Magill et al., 2019). Our ability to detect significant change at 12 months but not 24 months may be related to greater participant attrition at the latter time point.

Shockley's validation study had previously noted that the relative weights associated with three of the dimensions—satisfaction, meaningful work, and authenticity—were most consistently significantly related to the outcomes (Shockley et al., 2016). Of note, in our study, only the last two of the three dimensions were significantly associated with the intervention. Although satisfaction has frequently been mentioned as a component of success, meaningful work, and authenticity are increasingly important concepts (Shockley et al., 2016). Authenticity, defined as shaping the direction of one's career according to personal needs and preferences, aligns well with the notion of the "new career" as self-directed and on one's own terms. The role of meaningful work as a dimension of success has emerged as important over time, as is shown by Shanafelt's study on drivers of burnout (Shanafelt et al., 2009).

Overall, the results of Shockley's relative weights analysis highlight the importance of considering the individual dimensions of the SCSI as well as the global construct (Shockley et al., 2016). This approach could be useful in understanding, for example, how certain personality variables may predict specific SCS dimensions, such as personal life. This approach may also help study customized career interventions. For example, sponsorship interventions may predict disproportionate improvement in the specific SCSI dimension of influence.

Institutions seeking to boost mentee career success should consider creating, implementing, and evaluating mentor development programs, which may be an important strategy to enhance an organization's mentoring climate (Tigges et al., 2020). However, to improve mentees' objective scholarly productivity, institutions may also consider professional development strategies beyond mentor development interventions alone (such as mentee grant writing and manuscript writing plus peer review programs).

The strengths of our study include our theoretically grounded intervention, which has been previously shown to improve mentor outcomes (Sood et al., 2020), the use of a randomized controlled trial study design, and the enrollment of a relatively high proportion of women (68%) and URM (18%) participants. There are, however, several limitations of this study. First, the convenience-based sample size was relatively small, comprising only 94 mentees with unequal sample sizes in the intervention and control groups; the study recruitment during the Covid-19 pandemic may constrain our ability to detect slight differences between the groups in some SCSI dimensions, such as the satisfaction dimension, despite seemingly adequate power calculations for the global SCSI score. Second, the study was conducted in mostly underfunded medium-sized institutions in the western and southwestern United States, thereby limiting the applicability of the results to institutions with a stronger academic culture. Additionally, the study could not account for professional development

workshops, conferences, or other career success tools that faculty mentees may have independently utilized, regardless of their mentors' assignment to the control or intervention group. Future research may examine effect modification related to mentee characteristics, which the current study was not powered to detect. Future qualitative analysis may also examine the reasons for the intervention-related differences between subjective career success and quantitative scholarly productivity mentee outcomes.

Conclusion

In conclusion, this study provides valuable insights into the positive effects of theoretically-guided and competency-based mentor development interventions on the subjective career success of faculty mentees. The findings indicate that the mentor development intervention significantly enhanced faculty mentees' global SCSI score and multiple dimension scores at 12 months from baseline. By demonstrating the beneficial impact of a mentor development intervention on mentees' perceived career success, the study strengthens the value of the intervention as an institutional investment for enhancing developmental networks and informing future mentoring programs and activities, and polices and guidelines. Based on the study findings, academic health centers should invest in creating, implementing, and evaluating mentor development programs, which may also be an important strategy to enhance their organizational mentoring climate.

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