

# A quantitative review of mentoring research: Test of a model

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## Abstract

Over the past 25 years, numerous researchers have studied the effects of mentoring on work outcomes. However, several reviewers have noted that many of the observed relationships between mentoring and its outcomes are potentially spurious. To summarize this widely dispersed literature, a quantitative research synthesis was conducted focused on estimating multivariate analytical paths between mentoring and several career outcomes, while holding constant correlates of mentoring including demographics, human capital, and core self-evaluations. The results demonstrate that mentoring does have substantial effects on job and career satisfaction after holding these covariates constant; yet factors such as core self-evaluations, tenure, and education have stronger effects on objective career outcomes. Potential future directions to enrich the study of mentoring and career success are described.

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## 1. Introduction

Although the concept of mentoring dates back to the earliest stages of human civilization, the pioneering qualitative work of Levinson, Darrow, Klein, Levinson, and McKee (1978) and Kram (1983) suggested that mentoring is a powerful influence on success in organizational environments. Despite promising theoretical propositions, several recent qualitative reviews of the literature note that there is considerable ambiguity regarding the outcomes of mentoring, with some studies reporting strong relationships between mentoring and career outcomes, while others find far less support (Noe, 1988a; Ragins, 1999a; Russell & Adams, 1997; Wanberg, Welsh, & Hezlett, 2003). In response to these concerns, a meta-analysis demonstrated that after aggregating across a variety of studies, there are reliable, but small, effects of mentoring on several career outcomes (Allen, Eby, Poteet, Lentz, & Lima, 2004).

However, as Shadish (1996) has argued, although meta-analysis is a valuable statistical technique, a limitation of univariate meta-analysis is that “the statistical models used in most meta-analyses have probably been very poor approximations to any reasonable theoretical models about the causal structures that give rise

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to meta-analytic data” (p. 50). To remedy this substantive limitation, the use of causal modeling techniques based on meta-analytic data has been advocated (Viswesvaran & Ones, 1995). Such models are especially useful in fields where there is a question of the contribution of several related variables to a common outcome like performance or success, as demonstrated in the literatures on staffing (Schmidt & Hunter, 1998), self-efficacy (Judge, Jackson, Shaw, Scott, & Rich, 2007) and training (e.g., Colquitt, LePine, & Noe, 2000). The current study provides a quantitative synthesis of the mentoring literature in hopes of resolving issues related to: (a) the definition and functions of mentoring, (b) assessment of the effects of mentoring in multivariate models, and (c) an examination of the influence of mentoring on markers of career success relative to other related constructs. The structural model used in the study appears in Fig. 1.

### 1.1. Definition and dimensions

Consistent with previous meta-analytic work, we compare how various measures of mentoring might relate to career outcomes (Allen et al., 2004). Researchers often provide research participants with a definition of mentoring and then ask a single question about whether respondents have such a relationship. As an example, Allen, Potteet, Russell, and Dobbins (1997) told respondents that, “Mentors are persons usually considered as more experienced, who support, train, ‘teach the ropes to’ or sponsor others as they pursue their career goals. Although your boss, manager, and/or supervisor can be a mentor, usually a mentor does not have to involve a day-to-day formal supervisory relationship” (p. 9). Similar definitions for mentoring can be found in numerous other studies (e.g., Chao, 1997; Dreher & Cox, 1996; Ragins & Cotton, 1991). This measurement strategy allows for an examination of the effect of having a mentor, yet treats all mentors as equally effective.

To deal with the quality of mentoring, researchers also have employed continuous indices of mentoring quality. These indices answer a completely different research question involving whether different mentors are differentially effective—in other words, all participants have mentors, and the question for researchers involves which types of mentors are most effective. One of the most direct methods for achieving this end is the use of aggregated scales of mentoring quality (e.g., Dreher & Ash, 1990; \*Feldman, Folks, & Turnley, 1999; Gilbert & Ivancevich, 1999; Hollingsworth & Fassinger, 2002; Kahn, 2001; Mullen, 1998). Mentoring relationships have also been described in terms of two broad categories of functions supposedly provided by mentors based on both qualitative and quantitative data (Kram, 1983; Noe, 1988a; \*Tepper, Shaffer, & Tepper, 1996). *Career functions* include actions such as providing the protégés with human capital enhancement opportunities and links to powerful individuals in the organization. *Psychosocial functions* include counseling the protégé about anxieties and uncertainty, providing friendship and acceptance, and role modeling. Previous meta-analytic work showed differential relationships between mentoring functions and outcomes,

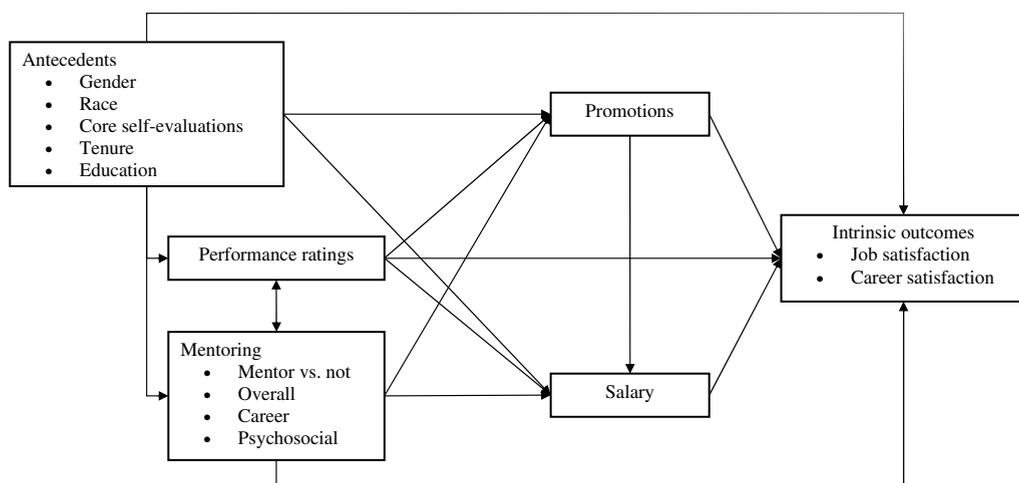


Fig. 1. Structural model of the relationship between mentoring and outcomes.

but all of the relationships were in the same direction and many were of similar magnitude (Allen et al., 2004). Unfortunately, the correlation between mentoring methods was not investigated, leaving the dimensionality of mentoring open to question, especially since confirmatory factor analysis has suggested the two factor model explains the data little better than a single factor model (Tepper et al., 1996). Our model attempted to answer this question.

### *1.2. Antecedents of mentoring*

At the same time that writers observed that mentors may serve important career functions for many protégés, it was recognized that some individuals are more likely to receive mentoring than others. One proposition is that women and minorities may encounter more barriers to obtaining a mentor than White men and may, therefore, be less likely to have a mentor or receive quality mentoring (Noe, 1988b; Ragins, 1999a, 1999b). Self-report data suggest that women perceive that there are more barriers to gaining a mentor than do men (Ragins & Cotton, 1991), but the empirical evidence that women and minorities end up with fewer mentors or receive less mentoring is inconclusive (Ragins, 1999a; Wanberg et al., 2003).

Another potential antecedent of mentoring is human capital, in the form of education and organizational tenure. There is considerable evidence that mentors select protégés based on their expected productivity. Allen, Poteet, and Burroughs (1997) found in their qualitative interviews with 27 mentors that mentors seek out competent, motivated individuals to serve as protégés. Similar findings have been reported in subsequent studies (Allen, 2004; Allen, Poteet, & Russell, 2000). Mentors deliberately seek capable individuals to act as protégés under the expectation that these protégés will be the best able to reciprocate the mentor's assistance by giving information and providing the mentor with power in the organization (e.g., Mullen & Noe, 1999; Ragins, 1997; Ragins & Scandura, 1994). Individuals who are more educated and experienced therefore may be more likely to attract mentors.

Similar to education and tenure, a person's self-image has dual effects by both leading to job performance and career rewards, and also making the individual more attractive to potential mentors. Evidence from studies of core self-evaluations show that these variables related significantly to motivation, job performance, and job satisfaction (Erez & Judge, 2001; Judge & Bono, 2001; Judge, Erez, Bono, & Thoresen, 2003). Since motivation and performance have been described as characteristics sought by mentors, and satisfaction and income are the proposed outcomes of mentoring, it appears that core self-evaluations might be the ideal dispositional trait as a control in studies of mentoring.

### *1.3. Correlates of mentoring*

Because performance is associated with mentoring (Allen et al., 1997; Allen et al., 2000), and because it relates to extrinsic career success in the form of pay and promotions (see Gerhart & Milkovich, 1992; for a review), it is important that estimates of the effect of mentoring take performance into account. Because it is not possible to determine the extent to which productivity is a cause or an effect of mentoring, we treat these variables as having a noncausal association. Another possible confound in studies of mentoring is the fact that mentoring status may be the result of variables that are well-known antecedents of positive career outcomes such as tenure and education (Wanberg et al., 2003).

### *1.4. Outcomes of mentoring*

Effectiveness in one's career is traditionally assessed with a combination of subjective perceptions as well as attitudes towards one's job and career progress (Hall, 2002; Judge, Higgins, Thoresen, & Barrick, 1999). Extrinsic success has generally been defined in terms of a person's current salary and either the number of promotions one has received over a time period or in terms of a person's rank in an organization's hierarchy. The effect of mentoring on protégé intrinsic success should come through two distinct pathways. First, mentor effects on extrinsic career success should have a subsequent effect on protégé intrinsic success (Judge, Cable, Boudreau, & Bretz, 1995). This is shown in Fig. 1 as the paths between mentoring and salary and promotions, with additional paths from these extrinsic success factors and intrinsic outcomes. Because mentors also pro-

vide their protégés with psychological support and opportunities for development, it is likely that they will also directly contribute to the general satisfaction of protégés above and beyond the extrinsic rewards they can secure for their protégés (Russell & Adams, 1997).

## 2. Method

### 2.1. Literature search

To identify all possible studies of mentoring, we searched the PsycINFO database (1887–2007) for studies (articles, book chapters, dissertations, and unpublished reports) that referenced the terms “mentor”, “mentoring”, or “mentorship”. Our search efforts resulted in the identification of 3174 abstracts. In reviewing the abstracts, we eliminated studies that clearly did not include primary data (such as qualitative studies or reviews) and studies that did not appear to measure mentoring or its functions. For the remaining 366 studies, we examined each to determine whether it contained the information needed to calculate correlations among variables included in this study. Additionally, we requested 111 unpublished doctoral dissertations and examined those that were made available to us for the same information; 14 of these dissertations contained data relevant to our analyses that were not covered in published articles.

Studies that measured the variables of interest and contained a measure of association among variables were included in the final analysis. For those articles that required a conversion of means, standard deviations, *t*- or *F*-statistics into correlations, the authors collaborated to insure accurate translation. Numerous studies were excluded because they reported percentages or proportions of means with no standard deviations, or because they reported other measures of association that could not be converted to correlations. In total, 120 unique samples from 113 distinct publications and dissertations met the criteria for inclusion in the database. Because of the intervening time between articles, a broader scope for analyses, and different search techniques, our analyses cover approximately three times the number of studies included in the previous Allen et al. (2004) meta-analysis.

### 2.2. Meta-analytic procedures

We used psychometric meta-analysis (Hunter & Schmidt, 1990) to estimate the validity and predictors of mentoring, as well as the correlations among the mentoring variables. We corrected each primary correlation for attenuation due to unreliability in both the predictor and the criterion, and then we computed the sample-weighted mean of these corrected correlations. To estimate parameters describing the variability of the meta-analytical estimates and the confidence in these estimates, the variance of the observed individual estimates was corrected for the effects of both sampling and measurement error as well. Both the unadjusted ( $\bar{r}$ ) and reliability corrected ( $\hat{\rho}$ ) correlations are presented throughout the paper. In the majority of studies, authors reported the internal consistency reliability for the measures. When reliabilities for the mentoring variables or the outcomes were not reported, we created a sample size weighted average of the reliabilities reported in the studies that did provide such estimates, and used these reliability values (denoted  $\bar{\alpha}$ ) to correct the primary correlations.

Most studies provided correlations between mentoring and other variables without providing a correlation with a composite of mentoring measures. In these cases, we took the mean of the measures of mentoring within these studies and used this for the overall analysis. An important assumption in meta-analysis is that correlations included in any analysis are independent (Hunter & Schmidt, 1990). Accordingly, we ensured that each correlation included in the analysis had not been reported previously in another publication.

In addition to reporting point estimates for corrected correlations, the variability of these estimates determines the generalizability of observed effects after artifacts including sampling error variance and measurement unreliability are taken into account. Accordingly, we report the standard deviation of the corrected correlation ( $SD_{\hat{\rho}}$ ), as well as the standard error ( $SE_{\hat{\rho}}$ ). The standard deviation of the corrected correlation ( $SD_{\hat{\rho}}$ ) describes the variability of the individually corrected correlations across the population of studies, whereas the standard error of the corrected correlation ( $SE_{\hat{\rho}}$ ) provides an estimate of the variability around

the estimated mean corrected correlation that is due to sampling error. Thus,  $SE_{\rho}$  estimates variability in the mean correlation while  $SD_{\rho}$  describes variability in the individual correlations across the studies.

### 2.3. Classification procedures

#### 2.3.1. Definition and dimensions

We classified measures of mentoring into three categories: (1) a dichotomous variable representing whether the individual had received mentoring or not; (2) overall measures of mentoring quality or satisfaction with one's mentor (e.g., Dreher & Ash, 1990); and (3) measures of career or psychosocial mentoring functions using established scales of mentor functions. Most measures of career or psychosocial functions came from either the scale developed by Noe (1988a) or Scandura (1992). Because the dichotomous indicators of mentoring are single items, no internal consistency reliability estimates can be provided for these constructs and it is necessary to assume they are measured without error. The overall measures of mentoring quality had  $\bar{\alpha} = .86$ , the career function scales had  $\bar{\alpha} = .84$ , and the psychosocial function scales had  $\bar{\alpha} = .83$ . It should be noted that the dichotomous indicator and the continuous scales reflect completely different variables.

#### 2.3.2. Antecedents of mentoring

We investigated five correlates of mentoring: (1) protégé gender; (2) protégé race; (3) protégé core self-evaluations; (4) protégé tenure; and (5) protégé education. The first two measures were primarily derived from self-report data on demographics and are assumed to be measured without error. Because core self-evaluations reflect a combination of self-esteem, neuroticism, locus of control, and trait self-efficacy (Judge, Erez, Bono, & Thoresen, 2002), relationships involving any of the variables were used as indicators of relationships with core self-evaluations. Across the measures of core self-evaluations, the average reliability was  $\bar{\alpha} = .85$ . Protégé tenure and education were derived primarily from self-report data and are assumed to be measured without error.

#### 2.3.3. Performance

Performance was measured based on a variety of measures, including objective measures of performance, perceived competence of the protégé, and the mentor's appraisal of the quantity of work provided by the protégé. Because protégé performance included several measures, we investigated whether these different measures affected the correlation of mentoring with performance. Using the WLS method of analyzing meta-analytic moderator effects (Steel & Kammeyer-Mueller, 2002), the results revealed that the correlations of mentoring with performance did not significantly vary by the way in which performance was measured. Across the measures of performance, the average reliability was  $\bar{\alpha} = .86$ .

#### 2.3.4. Outcomes of mentoring

Four outcomes of mentoring were examined: (1) promotions; (2) salary; (3) job satisfaction; and (4) career satisfaction. The first two measures were assumed to be measured without error because they generally were from single item measures of either counts or wages, while measures of job satisfaction had  $\bar{\alpha} = .85$  and measures of career satisfaction had  $\bar{\alpha} = .82$ .

### 2.4. Structural equations analyses

As described earlier, we conducted a structural equations analysis using LISREL 8.52 (Jöreskog & Sörbom, 2002), based on a meta-analytically derived correlation matrix among the variables. An overall model testing the multivariate effects of three mentoring variables (career function, psychosocial function, and overall) on the outcomes was tested using the theory-testing approach described by Viswesvaran and Ones (1995).

Meta-analytic structural equations analysis requires estimates for all elements in the relevant correlation matrix. For the intercorrelations among most of the variables, we used the studies included in the meta-analysis to perform bivariate meta-analyses among the variables. Where there were very few existing studies we could locate in the mentoring literature, we used existing meta-analytic correlations. For example, only one study reported a correlation between job satisfaction and job performance, so we used Judge, Thoresen, Bono, and Patton's (2001) meta-analytic estimate of the job satisfaction–job performance relationship. The meta-

analytic correlation between education and job performance was taken from Hunter and Hunter (1984). Additionally, when there were few correlations for the relationships among other variables (e.g., the correlation between performance and salary, the correlation between age and promotions, etc.), we conducted a search of PsycINFO for these pairs of variables and performed meta-analyses of these bivariate relationships. In all cases, at least five correlations available between the variables were obtained. The  $\bar{r}$  estimates were entered into LISREL with coefficients linking each manifest correlation to its latent indicator set to  $\sqrt{1 - \bar{\alpha}}$  (Jöreskog & Sörbom, 1996).

Once we constructed the meta-analytic correlation matrix, we used the correlations as input into the LISREL model. To compute the standard errors associated with the structural coefficients, following Viswesvaran and Ones (1995), we used the harmonic mean of the sample sizes for each meta-analytic correlation. Only sample sizes for correlations with mentoring were used to avoid artifactually inflating the meta-analytic sample sizes based on the large  $N$  in most of the correlations between control variables. None of the cells in the meta-analytic correlation matrix have a sample size below  $N = 341$ . Even with the conservative exclusion of the control variables from estimating the harmonic means, the sample sizes are large, making almost all path coefficients significant even if the magnitude is of questionable practical significance. Because the primary purpose of the current study was to estimate multivariate effect sizes rather than estimating different mediating causal structures, minimal analytical constraints were imposed on the path models. The resulting models were fully saturated, and as such all models fit perfectly with 1 model degree of freedom. Because the goal was to test the effect of mentoring net of possible confounding influences, the saturation of the model is to be expected.

### 3. Results

Tables 1 and 2 present the meta-analytic estimates of the zero-order correlations between mentoring and several outcomes. Two separate measures of the distribution of these estimates are presented (Whitener, 1990). First, the 90% credibility intervals based on the standard deviation of  $\hat{\rho}$  are shown, which indicate the range of (corrected) correlations which were observed in individual samples. Second, the 95% confidence intervals based on the standard error of  $\hat{\rho}$  are shown, which indicate the range of possible true population correlations which could be expected to generate the observed estimate of  $\hat{\rho}$ . We additionally meta-analyzed the relationships between mentoring and salary, promotions, job satisfaction, and career satisfaction, but because

Table 1  
Relationships among mentoring, mentoring indices, and demographic/personality variables

	$k$	$N$	$\bar{r}$	$\hat{\rho}$	$SD_{\hat{\rho}}$	90% Credibility interval	$SE_{\hat{\rho}}$	95% Confidence interval
<i>Mentoring measures</i>								
Career-psychosocial	41	7558	.55	.66	.22	[.37–.94]	.04	[.59–.73]
<i>Protégé gender</i>								
Mentor vs. not	18	7990	.00	.00	.05	[–.07–.07]	.02	[–.03–.03]
Mentoring overall	27	5319	–.05	–.05	.00	[–.05–.05]	.01	[–.08–.03]
Career function	24	7376	–.03	–.03	.05	[–.09–.03]	.01	[–.06–.00]
Psychosocial function	21	4349	–.05	–.05	.07	[–.14–.03]	.02	[–.09–.01]
<i>Protégé race</i>								
Mentor vs. not	3	1954	.01	.01	.02	[–.02–.04]	.03	[–.04–.06]
Mentoring overall	10	1719	.01	.01	.00	[.01–.01]	.02	[–.04–.06]
Career function	9	1957	.10	.11	.10	[–.02–.23]	.04	[.03–.18]
Psychosocial function	8	1228	.03	.03	.00	[.03–.03]	.03	[–.02–.09]
<i>Protégé core self-evaluations</i>								
Mentor vs. not	6	1686	.09	.10	.05	[.04–.16]	.03	[.04–.16]
Mentoring overall	9	1282	.21	.24	.10	[.11–.37]	.04	[.16–.32]
Career function	4	341	.17	.21	.06	[.13–.29]	.06	[.09–.33]
Psychosocial function	5	728	.29	.34	.00	[.34–.34]	.03	[.28–.41]

Notes: gender was coded such that male = 1 and female = 0. Race was coded such that white = 1, non-white = 0.

Table 2  
Relationships among mentoring and human capital/performance variables

	<i>k</i>	<i>N</i>	$\bar{r}$	$\hat{\rho}$	<i>SD</i> $\hat{\rho}$	90% Credibility interval	<i>SE</i> $\hat{\rho}$	95% Confidence interval
<i>Protégé tenure</i>								
Mentor vs. not	9	3855	-.04	-.04	.08	[-.15-.06]	.03	[-.10-.02]
Mentoring overall	17	2704	-.03	-.04	.07	[-.13-.05]	.03	[-.09-.01]
Career function	15	5912	-.05	-.05	.07	[-.14-.03]	.02	[-.10-.01]
Psychosocial function	10	1407	-.03	-.04	.05	[-.10-.03]	.03	[-.10-.02]
<i>Protégé education</i>								
Mentor vs. not	9	2472	.00	.00	.11	[-.14-.14]	.04	[-.08-.08]
Mentoring overall	19	3325	.03	.04	.08	[-.07-.14]	.03	[-.02-.09]
Career function	13	4745	-.03	-.03	.08	[-.13-.06]	.03	[-.08-.02]
Psychosocial function	10	1231	-.01	-.01	.08	[-.12-.09]	.04	[-.09-.06]
<i>Job performance</i>								
Mentor vs. not	9	2432	.21	.22	.12	[.07-.37]	.04	[.14-.31]
Mentoring overall	15	2558	.21	.24	.14	[.06-.42]	.04	[.16-.32]
Career function	12	2363	.17	.20	.13	[.04-.36]	.04	[.12-.28]
Psychosocial function	9	1206	.18	.21	.13	[.04-.37]	.05	[.11-.30]

these analyses reached essentially the same point estimates as the uncorrected estimates from Allen et al. (2004), and our focus is on multivariate models, we omit a detailed reporting of these analyses.

The existence of moderators is assessed by comparing the credibility and confidence intervals across moderator categories. The comparison of moderators via subgrouping has been criticized for making statistical inference difficult by reducing the count of observations for each conditions, so as an additional check for moderators, a weighted least squares (WLS) regression analysis was conducted to determine if there were significant relationships between mentoring measures and observed effect sizes (Steel & Kammeyer-Mueller, 2002). This allows for a simultaneous statistical test for whether a combined set of hypothesized moderators is predictive of variance in observed effect sizes while holding potential confounds (reliability of predictors and outcomes) statistically constant.

The first analyses presented in Table 1 give the correlations among measures of mentoring. The results are consistent across the three primary measures of mentoring, with career and psychosocial mentoring measures correlated at  $.59 \leq \hat{\rho} \leq .73$ . The results from Table 1 show that across all moderator categories there is, at best, a very small relationship between mentoring and gender or race, with the exception of race and the career function, where there is evidence that Whites receive more mentoring. There was almost complete overlap in confidence intervals across all moderator categories with the exception of this last relationship. Core self-evaluations related significantly to all the mentoring measures, with especially strong relationships between core self-evaluations and psychosocial mentoring, and especially weak relationships between core self-evaluations and the mentoring indicator.

With regard to the human capital variables and performance, shown in Table 2, the results were mixed. Mentoring did not show substantial relationships with education or tenure, with small effect sizes and credibility intervals and confidence intervals that either overlapped with or came extremely close to zero. The results are somewhat different for performance. First, none of the 90% credibility intervals or 95% confidence intervals include zero. However, all the confidence intervals for observed effect sizes overlapped considerably. None of the moderator categories was significantly predictive of observed effect sizes in the WLS models, with all *t*-statistics for individual coefficients being below 1.0, suggesting that the various conceptualizations of mentoring have similar relationships with the human capital variables and performance.

As noted earlier, because of the possible correlations between mentoring and other variables that are related to several outcomes of mentoring, it would be informative to see how strongly mentoring is related to several key outcomes in multivariate models. The multivariate models also facilitate a comparison of the magnitude of mentoring's relationship to these outcomes relative to other predictors. Table 3 presents the meta-analytic correlation matrix that was used to estimate the path models for this study. The portion of the matrix below the diagonal gives the raw correlations which were used as inputs into the path model, while

Table 3  
Meta-analytic correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Mentor	1.00	n/a	n/a	n/a	.00	-.04	-.01	-.03	.10	.21	.06	.12	.16	.22
2. Overall	n/a	.86	n/a	n/a	-.05	-.04	.03	.01	.24	.20	.11	.08	.30	.32
3. Career	n/a	n/a	.84	.66	-.03	-.05	-.03	.11	.21	.20	.13	.09	.33	.28
4. Psychosocial	n/a	n/a	.55	.83	-.05	-.03	-.01	.03	.36	.22	.05	.03	.28	.20
5. Gender	.00	-.05	-.03	-.05	1.00	.03	.05	.00	.05	-.03	.15	.09	.09	-.03
6. Tenure	-.04	-.03	-.05	-.03	.03	1.00	-.05	.08	.03	.05	.28	.05	.08	-.05
7. Education	.00	.03	-.03	-.01	.05	-.05	1.00	.16	.13	.11	.29	.09	.04	.04
8. Race	.01	.01	.10	.03	.00	.08	.16	1.00	.01	.13	.04	.07	.05	.09
9. Core self-evaluations	.09	.21	.17	.29	.05	.03	.13	.01	.85	.15	.11	.18	.47	.40
10. Performance	.21	.21	.17	.18	-.03	.05	.10	.12	.12	.86	.27	.09	.22	.14
11. Salary	.07	.10	.12	.04	.15	.28	.29	.04	.10	.25	1.00	.50	.23	.28
12. Promotions	.12	.08	.08	.02	.09	.05	.09	.07	.16	.08	.50	1.00	.19	.22
13. Job satisfaction	.16	.30	.27	.22	.08	.07	.04	.05	.38	.16	.21	.19	.85	.51
14. Career satisfaction	.22	.30	.25	.17	-.03	-.05	.04	.09	.32	.12	.25	.20	.43	.82

Notes: correlations below diagonal are raw meta-analytic correlations, correlations above diagonal are corrected for unreliability in both variables. Values on the diagonal represent average estimated reliabilities. For gender, male = 1, female = 0; for race, white = 1, non-white = 0.

the portion above the diagonal shows the correlations which were corrected for unreliability through the LISREL procedure for path analysis described earlier. Estimates of the internal consistency of each measure are presented on the diagonal in italics.

Table 4 shows results from three distinct path models: in the first model the dichotomous indicator of mentoring is used; in the second model the aggregate “overall” quality of mentoring is used; and in the third model the two primary mentor functions are used. Across all analyses, receiving mentoring is a more significant predictor of affective or subjective outcomes than objective outcomes whether the indicator of mentoring reflected

Table 4  
Estimates from structural models

	Mentor indicator model				Overall mentor rating model				Mentor functions model			
	Prom.	Salary	Job sat.	Car. sat.	Prom.	Salary	Job sat.	Car. sat.	Prom.	Salary	Job sat.	Car. sat.
<i>Antecedents</i>												
Gender	.08**	.10**	.06**	.00	.08**	.10**	.07**	.02	.08**	.10**	.07**	.01
Race	.05**	-.08**	.03	.12**	.05*	-.08**	.03	.11**	.04	-.09**	.00	.08**
Core self-evaluations	.15**	-.05**	.42**	.37**	.15**	-.06**	.37**	.32**	.18**	-.06**	.39**	.34**
Tenure	.04*	.26**	.04*	-.16**	.04*	.27**	.05**	-.15**	.04	.27**	.06**	-.13**
Education	.06**	.25**	-.05	-.12**	.05**	.26**	-.04*	-.11**	.06*	.26**	-.02	-.09**
<i>Performance</i>												
Performance	.03	.22**	.14**	-.03	.05*	.20**	.10**	-.03	.05	.20**	.12**	.00
<i>Mentoring</i>												
Mentor indicator	.10**	-.02	.09**	.18**								
Overall rating					.04	.04*	.23**	.25**				
Career mentoring									.13**	.14**	.25**	.21**
Psychosocial mentoring									-.13**	-.06	-.06	-.08*
<i>Objective outcomes</i>												
Salary			.02	.30**			.00	.28**			-.02	.24**
Promotions		.45**	.12**	.00		.45**	.13**	.01		.44**	.13**	.02
Full model R <sup>2</sup>	.06	.44	.28	.29	.05	.44	.32	.31	.06	.45	.31	.24

Notes: Prom., promotions; Job sat., job satisfaction; Car. sat., career satisfaction.  $n = 3135$  for mentor indicator model.  $n = 2485$  for the overall mentor rating model.  $n = 1654$  for the mentor functions model. All  $n$  based on the harmonic mean of the sample sizes.

\*  $p < .05$ .

\*\*  $p < .01$ .

simply having or not having a mentor, or if the comparison was among mentored individuals with the quality of the mentoring provided acting as the explanatory variable. Second, mentoring remains a significant predictor of several outcomes after accounting for human capital and individual differences variables. The indicator for whether one had a mentor and the continuous measure of career mentoring among those who had mentors were both positively related to promotions, while the overall mentoring quality variable was not significantly related to promotions, and, paradoxically, psychosocial mentoring was *negatively* related to promotions. Only the overall mentoring variable and career mentoring were significantly related to salary levels. Whereas having a mentor was significantly related to job and career satisfaction, among those who had mentors, overall mentoring and career mentoring were strong predictors of affective measures of career success. Of all the variables in the model, only core self-evaluations and salary were comparable predictors of job and career satisfaction. Again, paradoxically, psychosocial mentoring was significantly negatively related to career satisfaction although the relationship is small in magnitude.

One additional issue that can be addressed with these data is the extent to which mentoring mediates the relationship between antecedents of mentoring (e.g., gender, race, core self-evaluations, tenure, and education) and career outcomes. The relatively weak zero-order correlations between demographics and the mentoring functions, coupled with the significant relationships between gender and race and the outcomes of mentoring, suggests that mentoring does not explain why women and non-Whites receive fewer promotions, lower salaries (for women) or are less satisfied with their jobs (for women) or their careers (for non-Whites). Similarly, the weak relationships between mentoring and tenure and education, and the remaining positive effects of these variables on objective measures of career success, coupled with weak negative effects on career and job satisfaction, suggests that mentoring is also not a mediating variable in this case.

#### 4. Discussion

The current research provides an opportunity to consider what we have learned from the study of one of the most focal work relationships—the mentoring relationship—to date. Our analyses included numerous potential antecedents and covariates of mentoring, including gender, race, core self-evaluations, tenure, education, and job performance which were not included in Allen et al. (2004) meta-analysis. Because of the examination of these correlates, we also determined how the purported effects of mentoring are modified once these variables were taken into consideration. This strengthens our appreciation of mentoring, because even with personality and other career related variables held constant, mentoring remains an important predictor of many career outcomes. However, when assessed relative to the effect sizes for variables like tenure and education (in predicting salary) and core self-evaluations (in predicting performance, job satisfaction, and career satisfaction), it appears that the benefits of mentoring are modest. Our structural model allows us to assess the distinct contribution of career and psychosocial mentoring when both are taken into account. The finding that career mentoring is considerably more important in a multivariate model was not previously demonstrated.

##### 4.1. Implications for mentoring

Overall, the results suggest that the effects on mentoring on career outcomes range from moderate to weak. When the effect of the mentoring variables was studied in the context of a path analysis, the results did not change appreciably, although the effects of mentoring tended to be considerably smaller than the effects of the covariates. Thus, although mentoring may not be properly labeled a useless concept to careers, neither can it be argued to be as important as the main effects of other influences on career success such as ability and personality (Judge et al., 1999), human capital (Judge et al., 1995), networks (Marini & Fan, 1997), or even the demographic variables included here.

Several alternative explanations for the relatively small effect sizes for mentoring can be offered. First, there is evidence to suggest that individuals who do not have mentors will seek out more information from their co-workers than individuals who do have mentors (Ostroff & Kozlowski, 1993). Thus, the advantage conveyed by mentors may be offset by the use of alternative information sources by those who do not have mentors as resources. Second, it may be that the effect of mentoring on career success is moderated by other such as mentor gender, and gender similarity (e.g., Scandura & Williams, 2001). Other moderating influences, such as the

ability and motivation of the protégé to implement whatever benefits the mentor bestows, may be operative. This last possibility seems especially worth examining, because mentors prefer protégés they perceive to be higher in willingness and ability to learn (Allen, 2004).

In addition to the modest nature of the average relationships, surprisingly, there was not much variability in effect sizes by the definition of mentoring. Regarding how mentoring was defined, the results demonstrated few substantial differences in observed effect sizes. In the multivariate models, career mentoring related significantly and positively to every single outcome, but psychosocial mentoring is either not significantly related, or negatively related to the outcomes. One possible interpretation is that multicollinearity between the mentor functions influenced the results (Cohen, Cohen, West, & Aiken, 2003). The lack of distinction between mentoring forms corresponds to the high correlations among the mentoring measures ( $.59 \leq \hat{\rho} \leq .73$ —see Table 1). In considering the implications of these strong correlations, it is worth noting that the correlations among the mentoring measures is quite similar to the average in correlation among the dimensions of organizational citizenship behavior ( $\bar{r}_c = .67$ ) (LePine, Erez, & Johnson, 2002). Given the intercorrelations observed here with respect to the different conceptualizations of mentoring, like OCBs, the different conceptions of mentoring may be less distinct than has been assumed. Future research should investigate more explicitly whether it makes sense to distinguish among these various conceptions and measures of mentoring.

Another noteworthy finding was the weak relationship between mentoring and demographic variables. Our results are inconsistent with the assertion that a primary reason for gender-based earnings disparities is the differential availability of mentoring (e.g., Glass Ceiling Commission, 1995). The correlational data show that men are not more likely to report having mentors, and that both men and women find that their mentors provide similar mentoring. This coincides with prior research demonstrating few differences between outcomes for male and female protégés (Ragins, 1999a). Additionally, the multivariate results show that race and gender are substantial correlates of career outcomes even after mentoring is held statistically constant. This however, does not discount the possibility that there are different variables in men's and women's mentoring relationships that may explain differences in career outcomes.

Some might wonder if placing performance in our structural model eliminates the primary mechanism through which mentoring has its effects. Our goal in including performance in the structural model was not to pit performance versus mentoring as leading to specific outcomes, but rather, to show the influence of mentoring after performance as a potential mediator was taken into account. Additionally, because there is good reason to suspect that mentoring is more likely to be provided to individuals who are higher performers, it is not possible to attribute a relationship between mentoring and career outcomes unambiguously to mentoring without taking performance into account. There are reasons to suspect that mentoring might have performance-independent influences that should be examined in future research, as shown in our data. Ragins (1999b) notes that mentoring relationships provide resource and power for the protégé, and this is reflected in career enhancing measures that discuss factors like “protection” and “running interference” that would seem to enhance mentor work outcomes without necessarily improving their task performance.

#### 4.2. Implications for future research

The strongest correlations found in the current study were between attitudinal descriptions of mentoring and attitudinal measures of satisfaction with one's job or career. The lack of correspondence between objective and subjective measures highlights a need for studies that obtain measures of mentoring from other sources. Wanberg et al. (2003) noted that individuals with high negative affectivity may be more likely to report that they have not been helped with their careers and that they dislike their jobs, which would artificially generate a positive correlation between mentoring and job satisfaction. An analysis that combines more objective indicators of career success (promotions and salary) with more affective, subjective indicators (job and career satisfaction) might help to explain this result. Research starting from a classical training approach, with pre- and post-mentoring measures of work outcomes would be very instructive in this regard (e.g., Goldstein, 1993; Hellervik, Hazucha, & Schneider, 1992). Because mentoring is a dynamic process that unfolds in time (Wanberg et al., 2003), growth curve modeling studies would be especially instructive in this regard.

Given the fairly weak relationships between mentoring and most career outcomes, the time may have passed for research that investigates mentor functions as a primary determinant of the success of mentoring.

Several observers suggest that it may be more profitable to consider the mentor's position within the organization as an explanatory variable or by examining the social network that makes up the organization (Podolny & Baron, 1997; Siebert, Kraimer, & Liden, 2001; Wanberg et al., 2003). In short, it may not be especially helpful to one's career success if a relatively powerless or naïve mentor comes to one's assistance, no matter how helpful he or she may try to be. It is also possible that research will benefit from considering developmental relationships with multiple mentors simultaneously rather than concentrating on the behavior of a single influential individual (Higgins & Kram, 2001). In either event, it appears that if researchers wish to explain career success, they may increasingly have to turn away from mentor functions scales and towards a more detailed understanding of the mentor process as organizationally embedded.

## References

*Note: Studies included in the meta-analysis are preceded by an asterisk (\*).*

- Allen, T. D. (2004). Protégé selection by mentors: Contributing individual and organizational factors. *Journal of Vocational Behavior*, *65*, 469–483.
- \*Allen, T. D., Day, R., & Lentz, E. (2005). The role of interpersonal comfort in mentoring relationships. *Journal of Career Development*, *31*, 155–169.
- Allen, T. D., Eby, L. T., Poteet, M. L., Lentz, E., & Lima, L. (2004). Career benefits associated with mentoring for proteges: A meta-analysis. *Journal of Applied Psychology*, *89*, 127–136.
- Allen, T. D., Poteet, M. L., & Burroughs, S. M. (1997). The mentor's perspective: A qualitative inquiry and future research agenda. *Journal of Vocational Behavior*, *51*, 70–89.
- Allen, T. D., Poteet, M. L., & Russell, J. E. A. (2000). Protégé selection by mentors: what makes a difference? *Journal of Organizational Behavior*, *21*, 271–282.
- Allen, T. D., Poteet, M. L., Russell, J. E., & Dobbins, G. H. (1997). A field study of factors related to supervisors' willingness to mentor others. *Journal of Vocational Behavior*, *50*, 1–22.
- \*Allen, T., McManus, S. E., & Russell, J. E. A. (1999). Newcomer socialization and stress: Formal peer relationships as a source of support. *Journal of Vocational Behavior*, *54*, 453–470.
- \*Allen, T. D., Russell, J. E., & Maetzke, S. B. (1997). Formal peer monitoring: Factors related to protégés' satisfaction and willingness to mentor others. *Group & Organization Management*, *22*, 488–507.
- \*Armstrong, S. J., Allinson, C. W., & Hayes, J. (2002). Formal mentoring systems: An examination of the effects of mentor/protégé cognitive styles on the mentoring process. *Journal of Management Studies*, *39*, 1111–1137.
- \*Aryee, S., Lo, S., & Kang, I. (1999). Antecedents of early career stage mentoring among Chinese employees. *Journal of Organizational Behavior*, *20*, 563–576.
- \*Bahniuk, M. H., Dobos, J., & Hill, S. E. (1990). The impact of mentoring, collegial support, and information adequacy on career success. *Journal of Social Behavior and Personality*, *5*, 431–451.
- \*Bahniuk, M. H., Hill, S. E., & Darus Holly, J. (1996). The relationship of power-gaining communication strategies to career success. *Western Journal of Communication*, *60*, 358–378.
- \*Baker, B. T., Hocevar, S. P., & Johnson, W. B. (2003). The prevalence and nature of service academy mentoring: A study of navy midshipmen. *Military Psychology*, *15*, 273–283.
- \*Barone, K. A. (1990). Relating the mentoring functions to stress and satisfaction: An interactional view. *Dissertation Abstracts International*, 1517.
- \*Baugh, S. G., Lankau, M. J., & Scandura, T. A. (1996). An investigation of the effects of protégé gender on responses to mentoring. *Journal of Vocational Behavior*, *49*, 309–323.
- \*Baugh, S. G., & Scandura, T. A. (1999). The effects if multiple mentors on protégé attitudes toward the work setting. *Journal of Social Behavior & Personality*, *14*, 503–521.
- \*Blake-Beard, S. D. (1999). The cost of living as an outsider within: An analysis of the mentoring relationships and career success of Black and White women in the corporate sector. *Journal of Career Development*, *26*, 21–36.
- \*Bolino, M. C., & Feldman, D. C. (2000). The antecedents and consequences of underemployment among expatriates. *Journal of Organizational Behavior*, *21*, 889–911.
- \*Boyd, P. J. (1997). Mentoring by college faculty: Perception by students in evaluation of their satisfaction with college. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 0079.
- \*Bozionelos, N. (2004). Mentoring provided: Relation to mentor's career success, personality, and mentoring received. *Journal of Vocational Behavior*, *64*, 24–46.
- \*Burke, R. J., & McKeen, C. A. (1997). Benefits of mentoring relationships among managerial and professional women: A cautionary tale. *Journal of Vocational Behavior*, *51*, 43–57.
- \*Burke, R. J., Mckeen, C. A., & McKenna, C. (1993). Correlates of mentoring in organizations: The mentor's perspective. *Psychological Reports*, *72*, 883–896.
- \*Burke, R. J. (1984). Mentors in organizations. *Group & Organization Studies*, *9*, 353–372.

- \*Carter, M., & Francis, R. (2001). Mentoring and beginning teachers' workplace learning. *Asia-Pacific Journal of Teacher Education*, 29, 249–262.
- \*Chao, G. T. (1997). Mentoring phases and outcomes. *Journal of Vocational Behavior*, 51, 15–28.
- \*Chao, G. T., Walz, P. M., & Gardner, P. D. Formal and informal mentorships: A comparison on mentoring functions and contrast with nonmentored counterparts. *Personnel Psychology*, 45, 619–636.
- \*Colarelli, S. M., & Bishop, R. C. (1990). Career commitment: Functions, correlates, and management. *Group & Organization Studies*, 15, 158–176.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Colquitt, J. A., LePine, J. A., & Noe, R. A. (2000). Toward an integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology*, 85, 678–707.
- \*Corzine, J. B., Buntzman, G. F., & Busch, E. T. (1994). Mentoring, downsizing, gender and career outcomes. *Journal of Social Behavior and Personality*, 9, 517–528.
- \*Cox, T. H., & Nkomo, S. M. (1991). A race and gender-group analysis of the early career experience of MBAs. *Work & Occupations*, 18, 431–446.
- \*Cronan-Hillix, T., Gensheimer, L. K., Cronan-Hillix, W. A., & Davidson, W. S. (1986). Students' views of mentors in psychology graduate training. *Teaching of Psychology*, 13, 123–127.
- \*Dansky, Kathryn H. (1996). The effects of group mentoring on career outcomes. *Group & Organization Management*, 21, 5–21.
- \*Day, R., & Allen, T. D. (2004). The relationship between career motivation and self-efficacy with protégé career success. *Journal of Vocational Behavior*, 64, 72–91.
- \*Denton, M., & Zeytinoglu, I. U. (1993). Perceived participation in decision-making in a university setting: The impact of gender. *Industrial and Labor Relations Review*, 46, 320–331.
- \*Dohm, F., & Cummings, W. (2002). Research mentoring and women in clinical psychology. *Psychology of Women Quarterly*, 26, 163–167.
- \*Dreher, G. F., & Cox, T. H. (1996). Race, gender, and opportunity: A study of compensation attainment and the establishment of mentoring relationships. *Journal of Applied Psychology*, 81, 297–308.
- \*Dreher, G. F., & Ash, R. A. (1990). A comparative study of mentoring among men and women in managerial, professional, and technical positions. *Journal of Applied Psychology*, 75, 539–546.
- \*Dreher, G. F., & Chargois, J. A. (1998). Gender, mentoring experiences, and salary attainment among graduates of an historically black university. *Journal of Vocational Behavior*, 53, 401–416.
- \*Ensher, E. A., & Murphy, S. E. (1997). Effects of race, gender, perceived similarity, and contact on mentor relationships. *Journal of Vocational Behavior*, 50, 460–481.
- \*Ensher, E. A., Grant-Vallone, E. J., & Marelich, W. D. (2002). Effects of perceived attitudinal and demographic similarity on protégés' support and satisfaction gained from their mentoring relationships. *Journal of Applied Social Psychology*, 32, 1407–1430.
- \*Ensher, E. A., Thomas, C., & Murphy, S. E. (2001). Comparison of traditional, step-ahead, and peer mentoring on protégés' support, satisfaction, and perceptions of career success: A social exchange perspective. *Journal of Business & Psychology*, 15, 419–438.
- Erez, A., & Judge, T. A. (2001). Relationship of core self-evaluations to goal setting, motivation, and performance. *Journal of Applied Psychology*, 86, 1270–1279.
- \*Fagenson, E. A. (1989). The mentor advantage: Perceived career/job experiences of protégés versus non-protégés. *Journal of Organizational Behavior*, 10, 309–320.
- \*Fagenson, E. A. (1992). Mentoring—who needs it? A comparison of protégés' and nonprotégés' needs for power, achievement, affiliation, and autonomy. *Journal of Vocational Behavior*, 41, 48–60.
- \*Fagenson, E. A. (1994). Perceptions of proteges' vs. nonproteges' relationships with their peers, superiors, and department. *Journal of Vocational Behavior*, 45, 55–78.
- \*Fagenson-Eland, E. A., Marks, M. A., & Amendola, K. L. (1997). Perceptions of mentoring relationships. *Journal of Vocational Behavior*, 51, 29–42.
- \*Fagenson-Eland, E. A., & Baugh, S. G. (2001). Personality predictors of protégé mentoring history. *Journal of Applied Social Psychology*, 31, 2502–2517.
- \*Feldman, D. C., Folks, W. R., & Turnley, W. H. (1999). Mentor-protégé diversity and its impact on international internship experiences. *Journal of Organizational Behavior*, 20, 597–611.
- \*Finkelstein, L. M., Allen, T. D., & Rhoton, L. A. (2003). An examination of the role of age in mentoring relationships. *Group & Organization Management*, 28, 249–281.
- \*Friedman, R., Kane, M., & Cornfield, D. B. (1998). Social support and career optimism: Examining the effectiveness of network groups among Black managers. *Human Relations*, 51, 1155–1177.
- \*Gaskill, L. R., & Sibley, L. R. (1990). Mentoring relationships for women in retailing: Prevalence, perceived importance, and characteristics. *Clothing & Textiles Research Journal*, 9, 1–10.
- Gerhart, B., & Milkovich, G. T. (1992). Employee compensation: Research and practice (2nd ed.). In M. D. Dunnette & L. M. Hough (Eds.). *Handbook of industrial and organizational psychology* (Vol. 3, pp. 481–569). Palo Alto, CA: Consulting Psychologists Press.
- \*Gilbert, J. A., & Ivancevich, J. M. (1999). A re-examination of organizational commitment. *Journal of Social Behavior & Personality*, 14, 385–396.
- Glass Ceiling Commission (1995). *Fact-finding Report*. US Government Printing Office, Washington, DC.
- Goldstein, I. L. (1993). *Training in organizations: Needs assessment, development, and evaluation*. Belmont, CA: Wadsworth.

- \*Godshalk, V. M., & Sosik, J. J. (2000). Does mentor-protégé agreement on mentor leadership behavior influence the quality of a mentoring relationship? *Group & Organization Management*, 25, 291–317.
- \*Godshalk, V. M., & Sosik, J. J. (2003). Aiming for career success: The role of learning goal orientation in mentoring relationships. *Journal of Vocational Behavior*, 63, 417–437.
- \*Goh, Swee C. (1991). Sex differences in perceptions of interpersonal work style, career emphasis, supervisory mentoring behavior, and job satisfaction. *Sex Roles*, 24, 701–710.
- \*Gonzales-Figueroa, E., & Young, A. M. (2005). Ethnic identity and mentoring among Latinas in professional roles. *Cultural Diversity & Ethnic Minority Psychology*, 11, 213–226.
- \*Grant-Vallone, Elisa J., & Ensher, E. A. (2000). Effects of peer mentoring on types of mentor support, program satisfaction and graduate student stress. *Journal of College Student Development*, 41, 637–642.
- \*Green, S., & Bauer, T. N. (1995). Supervisory mentoring by advisers: Relationships with doctoral student potential, productivity, and commitment. *Personnel Psychology*, 48, 537–561.
- \*Haggis, K. M. (1998). The role of mentors and supportive peers in career development. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 0448.
- Hall, D. T. (2002). *Careers in and out of organizations*. Thousand Oaks, CA: Sage.
- Hellervik, L. W., Hazucha, J. F., & Schneider, R. J. (1992). Behavior change: Models, methods, and a review of evidence (2nd ed.). In M. D. Dunnette & L. M. Hough (Eds.). *Handbook of industrial and organizational psychology* (Vol. 3, pp. 823–895). Palo Alto, CA: Consulting Psychologists Press.
- Higgins, M. C., & Kram, K. E. (2001). Reconceptualizing mentoring at work: A developmental network perspective. *Academy of Management Review*, 26, 264–288.
- \*Higgins, M. C., & Thomas, D. A. (2001). Constellations and careers: Toward understanding the effects of multiple developmental relationships. *Journal of Organizational Behavior*, 22, 223–247.
- \*Hill, S. K., Bahniuk, M. H., & Dobos, J. (1989). The impact of mentoring and collegial support on faculty success: An analysis of support behavior, information adequacy, and communication apprehension. *Communication Education*, 38, 15–33.
- \*Hollingsworth, M. A., & Fassinger, R. E. (2002). The role of faculty mentors in the research trainings of counseling psychology doctoral students. *Journal of Counseling Psychology*, 49, 324–330.
- \*Horgan, D. D., & Simeon, R. J. (1990). Gender, mentoring, and tacit knowledge. *Journal of Social Behavior & Personality*, 5, 453–471.
- \*Hubbard, Susan S., & Robinson, Jacquelyn P. (1998). Mentoring: A catalyst for advancement in administration. *Journal of Career Development*, 24, 289–299.
- Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternate predictors of job performance. *Psychological Bulletin*, 96, 72–98.
- Hunter, J. E., & Schmidt, F. L. (1990). *Methods of meta-analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.
- \*Jandeska, K. E., & Kraimer, M. L. (2005). Women's perceptions of organizational culture, work attitudes, and role-modeling behaviors. *Journal of Managerial Issues*, 17, 461–478.
- \*Johnson, N. B., & Scandura, T. A. (1994). The effect of mentorship and sex-role style on male-female earnings. *Industrial Relations*, 33, 263–274.
- \*Jolly, K. J. (1999). The influence of demographics, training, experience, school and community setting, and working conditions on the job satisfaction of beginning California public elementary school principals. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 0957.
- Jöreskog, K., & Sörbom, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.
- Jöreskog, K.G., & Sörbom, D. (2002). *LISREL* (Version 8.52) [Computer software]. Lincolnwood, IL: Scientific Software International, Inc.
- Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, 86, 80–92.
- Judge, T. A., Cable, D. M., Boudreau, J. W., & Bretz, R. D. (1995). An empirical investigation of the predictors of executive career success. *Personnel Psychology*, 48, 485–519.
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluations scale (CSES): Development of a measure. *Personnel Psychology*, 56, 303–331.
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct? *Journal of Personality and Social Psychology*, 83, 693–710.
- Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, J. R. (1999). The Big Five personality traits, general mental ability, and career success across the lifespan. *Personnel Psychology*, 52, 621–652.
- Judge, T. A., Jackson, C. L., Shaw, J. C., Scott, B. A., & Rich, B. L. (2007). Self-efficacy and work-related performance: The integral role of individual differences. *Journal of Applied Psychology*, 92, 107–127.
- Judge, T. A., Thoresen, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction–job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, 127, 376–407.
- \*Kahn, J. (2001). Predicting the scholarly activity of counseling psychology students: A refinement and extension. *Journal of Counseling Psychology*, 48, 344–354.
- \*Kass, G. B. (1993). Men, women and the mentor relationship: An integration of traditional and contemporary perspectives. *Dissertation Abstracts International*, 6007.
- \*Kirchmeyer, C. (2002). Change and stability in managers' gender roles. *Journal of Applied Psychology*, 87, 929–939.
- \*Kirchmeyer, C. (1998). Determinants of managerial career success: Evidence and explanation of male/female differences. *Journal of Management*, 24, 673–692.

- Kram, K. E. (1983). Phases of the mentor relationship. *Academy of Management Journal*, 26, 608–625.
- \*Koberg, C. S., Boss, R. W., Chappell, D., & Ringer, R. C. (1994). Correlates and consequences of protégé mentoring in a large hospital. *Group & Organization Management*, 19, 219–239.
- \*Lankau, M. J., Carlson, D. S., & Nielson, T. R. (2006). The mediating influence of role stressors in the relationship between mentoring and job attitudes. *Journal of Vocational Behavior*, 68, 308–322.
- \*Lankau, M. J., Riordan, C. M., & Thomas, C. H. (2005). The effects of similarity and liking in formal relationships between mentors and protégés. *Journal of Vocational Behavior*, 67, 252–265.
- \*Lankau, M. J., & Scandura, T. A. (2002). An investigation of personal learning in mentoring relationships: Content, antecedents, and consequences. *Academy of Management Journal*, 45, 779–790.
- LePine, A. J., Erez, A., & Johnson, D. E. (2002). The nature and dimensionality of organizational citizenship behavior: A critical review and meta-analysis. *Journal of Applied Psychology*, 87, 52–65.
- Levinson, D. J., Darrow, C. M., Klein, E. G., Levinson, M. H., & McKee, B. (1978). *Seasons of a man's life*. New York: Knopf.
- Marini, M. M., & Fan, P. (1997). The gender gap in earnings at career entry. *American Sociological Review*, 62, 588–604.
- Mullen, E. J., & Noe, R. A. (1999). The mentoring information exchange: When do mentors seek information from their protégés. *Journal of Organizational Behavior*, 20, 233–242.
- \*Mobley, G., Melton, J. C., Marsh, K., & Lim, Y. Y. (1994). Mentoring, job satisfaction, gender, and the legal profession. *Sex Roles*, 31, 79–98.
- \*Mullen, E. J. (1998). Vocational and psychosocial mentoring functions: Identifying mentors who serve both. *Human Resource Development Quarterly*, 9, 319–331.
- \*Nicoloff, L. K., & Forrest, L. (1988). Gender issues in research and publication. *Journal of College Student Development*, 29, 521–528.
- \*Nielson, T. R. (1999). An analysis of mentoring in an integrated health care system: Factors of participation and productivity. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 4215.
- \*Nielson, T. R., Carlson, D. S., & Lankau, M. J. (2001). The supportive mentor as a means of reducing work-family conflict. *Journal of Vocational Behavior*, 59, 364–381.
- \*Noe, R. A. (1988a). An investigation of the determinants of successful assigned mentoring relationships. *Personnel Psychology*, 41, 559–580.
- Noe, R. A. (1988b). Women and mentoring: A review and research agenda. *Academy of Management Review*, 13, 65–78.
- \*Orpen, C. (1995). The effects of mentoring on employees' career success. *Journal of Social Psychology*, 135, 667–668.
- Ostroff, C., & Kozlowski, S. W. (1993). The role of mentoring in the information gathering processes of newcomers during early organizational socialization. *Journal of Vocational Behavior*, 42, 170–183.
- \*Payne, S. C., & Huffman, A. H. (2005). A longitudinal examination of the influence of mentoring on organizational commitment and turnover. *Academy of Management Journal*, 48, 158–168.
- \*Peluchette, J. V. E., & Jeanquart, S. (2000). Professionals' use of different mentor sources at various career stages: Implications for career success. *Journal of Social Psychology*, 140, 549–564.
- \*Perna, F. M., Zaichkowsky, L., & Bocknek, G. (1996). The association of mentoring with psychosocial development among male athletes at termination of college career. *Journal of Applied Sport Psychology*, 8, 76–88.
- Podolny, J. M., & Baron, J. N. (1997). Resources and relationship: Social networks and mobility in the workplace. *American Sociological Review*, 62, 673–693.
- Ragins, B. R. (1997). Diversified mentoring relationships in organizations: A power perspective. *Academy of Management Review*, 22, 482–521.
- Ragins, B. R. (1999a). Gender and mentoring relationship: A review and research agenda for the next decade. In G. N. Powell (Ed.), *Handbook of gender and work* (pp. 347–370). Thousand Oaks, CA: Sage.
- Ragins, B. R. (1999b). Where do we go from here, and how do we get there? Methodological issues in conducting research on diversity and mentoring relationships. In A. J. Murrell, F. J. Crosby, & R. J. Ely (Eds.), *Mentoring dilemmas: Developmental relationships within multicultural organizations*. *Applied social research* (pp. 227–247). Mahwah, NJ: Erlbaum.
- Ragins, B. R., & Cotton, J. L. (1991). Easier said than done: Gender differences in perceived barriers to gaining a mentor. *Academy of Management Journal*, 34, 939–951.
- \*Ragins, B. R., & Cotton, J. L. (1999). Mentor function and outcomes: A comparison of men and women in formal and informal mentoring relationships. *Journal of Applied Psychology*, 84, 529–550.
- \*Ragins, B. R., & McFarlin, D. B. (1990). Perceptions of mentor roles in cross-gender mentoring relationships. *Journal of Vocational Behavior*, 37, 321–339.
- \*Ragins, B. R., Cotton, J. L., & Miller, J. S. (2000). Marginal mentoring: The effects of type of mentor, quality of relationship, and program design on work and career attitudes. *Academy of Management Journal*, 43, 1177–1194.
- Ragins, B. R., & Scandura, T. A. (1994). Gender differences in expected outcomes of mentoring relationships. *Academy of Management Journal*, 37, 957–971.
- \*Richard, L. W. (1996). The relationship between organizational culture and the frequency, quality and array of mentoring activities among nurse executive mentors. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 0243.
- \*Riley, S., & Wrench, D. (1985). Mentoring among women lawyers. *Journal of Applied Social Psychology*, 15, 374–386.
- Russell, J. E. A., & Adams, D. M. (1997). The changing nature of mentoring in organizations: An introduction to the special issues on mentoring and organizations. *Journal of Vocational Behavior*, 51, 1–14.
- Scandura, T. A. (1992). Mentorship and career mobility: An empirical investigation. *Journal of Organizational Behavior*, 13, 169–174.

- Scandura, T. A., & Ragins, B. R. (1993). The effects of sex and gender role orientation on mentorship in male-dominated occupations. *Journal of Vocational Behavior*, *43*, 251–265.
- \*Scandura, T. A., & Schriesheim, C. (1994). Leader–member exchange and supervisor career mentoring as complementary constructs in leadership research. *Academy of Management Journal*, *37*, 1588–1602.
- \*Scandura, T. A., & Williams, E. A. (2001). An investigation of the moderating effects of gender on the relationships between mentorship initiation and protégé perceptions of mentoring functions. *Journal of Vocational Behavior*, *59*, 342–363.
- \*Scandura, T. A., & Williams, E. A. (2004). Mentoring and transformational leadership: The role of supervisory career mentoring. *Journal of Vocational Behavior*, *65*, 448–468.
- \*Scandura, T. A., & Ragins, B. R. (1993). The effects of sex and gender role orientation on mentorship in male-dominated occupations. *Journal of Vocational Behavior*, *43*, 251–265.
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, *124*, 262–274.
- \*Seibert, S. (1999). The effectiveness of facilitated mentoring: A longitudinal quasi-experiment. *Journal of Vocational Behavior*, *54*, 483–502.
- Siebert, S. E., Kraimer, M. L., & Liden, R. C. (2001). A social capital theory of career success. *Academy of Management Journal*, *44*, 219–237.
- Shadish, W. R. (1996). Meta-analysis and exploration of causal mediating processes: A primer of examples, methods, and issues. *Psychological Methods*, *1*, 47–65.
- \*Smith, Emilie P., & Davidson, W. S. (1992). Mentoring and the development of African–American graduate students. *Journal of College Student Development*, *33*, 531–539.
- \*Sosik, J. J., & Godshalk, V. M. (2000). The role of gender in mentoring: Implications for diversified and homogenous mentoring relationships. *Journal of Vocational Behavior*, *57*, 102–122.
- Steel, P. D., & Kammeyer-Mueller, J. D. (2002). Comparing meta-analytic moderator estimation techniques under realistic conditions. *Journal of Applied Psychology*, *87*, 96–111.
- \*Tenenbaum, H. R., Crosby, F. J., & Gliner, M. D. (2001). Mentoring relationships in graduate school. *Journal of Vocational Behavior*, *59*, 326–341.
- \*Tepper, B. J. (1995). Upward maintenance tactics in supervisory mentoring and nonmentoring relationships. *Academy of Management Journal*, *38*, 1191–1205.
- \*Tepper, B. J., Brown, S. J., & Hunt, M. D. (1993). Strength of subordinates' upward influence tactics and gender congruency effects. *Journal of Applied Social Psychology*, *23*, 1903–1919.
- \*Tepper, K., Shaffer, B. C., & Tepper, B. (1996). Latent structure of mentoring function scales. *Educational and Psychological Measurement*, *56*, 848–857.
- \*Thomas, D. A. (1990). The impact of race on managers' experiences of developmental relationships (mentoring and sponsorship): An intra-organizational study. *Journal of Organizational Behavior*, *11*, 479–492.
- \*Torrance, E. P. (1983). Role of mentors in creative achievement. *Creative Child & Adult Quarterly*, *8*, 8–15.
- \*Torsella, P. A. (1994). The quantity, quality, and impact of mentoring relationships among nurse faculty in academe. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 5096.
- \*Turban, D. B., & Dougherty, T. W. (1994). Role of protégé personality in receipt of mentoring and career success. *Academy of Management Journal*, *37*, 688–702.
- \*Ulku-Steiner, B. S. (1997). Women and men in doctoral education: Students' experiences in gender-balanced and male-dominated programs. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 2158.
- Viswesvaran, C., & Ones, D. S. (1995). Theory testing: Combining psychometric meta-analysis and structural equations modeling. *Personnel Psychology*, *48*, 865–885.
- \*Wagner, C. R. (1992). Mentoring and job satisfaction in eleven northeast Minnesota school districts. *Dissertation Abstracts International*, 2398.
- Wanberg, C. R., Welsh, E. T., & Hezlett, S. A. (2003). Mentoring research: A review and dynamic process model. In J. J. Martocchio & G. R. Ferris (Eds.), *Research in personnel and human resources management* (Vol. 22, pp. 39–124). Oxford, UK: Elsevier Science.
- \*Waters, L., McCabe, M., Kiellerup, D., & Kiellerup, S. (2002). The role of formal mentoring on business success and self-esteem in participants of a new business start-up program. *Journal of Business and Psychology*, *17*, 107–121.
- Watkins, C. E., & Subich, L. M. (1995). Annual review, 1992–1994: Career development, reciprocal work/non-work interaction, and women's workforce participation. *Journal of Vocational Behavior*, *47*, 109–163.
- \*Wayne, S. J., Liden, R. C., Kraimer, M. L., & Graf, I. K. (1999). The role of human capital, motivation and supervisor sponsorship in predicting career success. *Journal of Organizational Behavior*, *20*, 577–595.
- \*Westermeyer, J. F. (1998). Predictors and characteristics of mental health among men at midlife: A 32-year longitudinal study. *American Journal of Orthopsychiatry*, *68*, 265–273.
- \*Whitely, W. T., & Coetsier, P. (1999). The relationship of career mentoring to early career outcomes. *Organization Studies*, *14*, 419–441.
- Whitener, E. M. (1990). Confusion of confidence intervals and credibility intervals in meta-analysis. *Journal of Applied Psychology*, *75*, 315–321.
- \*Yamada, H., & Tam, A. Y. (1996). Prediction study of adult creative achievement: Torrance's longitudinal study of creativity revisited. *Journal of Creative Behavior*, *30*, 144–149.
- \*Yoder, L. H. (1992). A descriptive study of mentoring relationships experienced by army nurses in head nurse or nursing supervisor roles. *Military Medicine*, *157*, 518–523.
- \*Yoder, L. H. (1995). Staff nurses' career development relationships and self-reports of professionalism, job satisfaction, and intent to stay. *Nursing Research*, *44*, 290–297.