

Understanding Employment Disparities Using Glass Ceiling Effects Criteria: An Examination of Race/Ethnicity and Senior-Level Position Attainment Across the Academic Workforce

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Abstract: *Employment disparities in higher education have been directly or indirectly discussed in the literature over the past 20 years. Little of this research uses the effects of the glass ceiling to understand employment disparities experienced by people of color in senior-level positions in higher education. Informed by glass ceiling effects criteria, this study draws on findings from an analysis of the 1999 National Study of Postsecondary Faculty to examine employment disparities. This study explores whether social capital, human capital, ability, and motivation variables can help explain the low observed representation for people of color in senior-level positions in the academic workforce.*

Previous empirical research suggests that people of color face disadvantages in managerial and professional settings (e.g., Ards, Brintnall, & Woodard, 1997; Burbridge, 1994; Frankforter, 1996; Jackson & Daniels, 2007; Jacobs, 1992; Johnsrud & Heck, 1994; Morrison, White, & Van Velsor, 1987; Morrison & Von Glinow, 1990; Powell & Butterfield, 1997). The findings from these studies not only document acrimonious experiences in the work place, but significant

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gaps in earnings, slower promotion rates, and artificial “ceilings” that limit employees’ professional advancement within the organization. This latter phenomenon, often referred to as the “glass ceiling,” embodies “those artificial barriers based on attitudinal organizational bias that prevent qualified individuals from advancing upward in their organization into management-level positions” (Martin, 1991, p. 1). Since the 1980s the federal government¹ has acknowledged the glass ceiling as a barrier and impediment to the advancement for women and people of color in the workplace (Johnson & Packer, 1987).

As documented in the literature, most of the previous research on the glass ceiling is focused on gender inequities (e.g., Bernhardt, Morris, & Handcock, 1995; Davies-Netzley, 1998). Therefore, very little of the knowledge about the glass ceiling is informed by research focused on race/ethnicity. Additionally, for the most part, the concept of glass ceiling as a measure of inequity is situated largely within the business and public administration literature. Nonetheless, nascent research addresses the glass ceiling within education more broadly and higher education in particular. Of this growing body of research, only a few studies have attempted to differentiate or make a clear distinction between general inequities and glass ceiling effects in higher education (e.g., Johnsrud, 1991; S. Lee, 2002; Sagaria, 1988; Turner & Myers, 1999). Curiously, even fewer of these studies have attempted to apply a rigorous measurement of glass ceiling effects criteria. In response to these shortcomings, and in an attempt to differentiate the possible effects of racial bias in the academic workforce, this study applied criteria developed by Cotter, Hermsen, Ovadia, and Vanneman (2001) to explore glass ceiling effects to help understand employment disparities based on racial and ethnic differences.

The purpose of this study was to build on previous research (e.g., Maume, 2004) that applies Cotter et al.’s (2001) criteria to explore position attainment through the lens of glass ceiling effects. Moreover, our aim was to do so within the context of the academic workforce. Specifically, this study asked: do race/ethnicity differences exist for senior-level position attainment in the academic workforce, after

¹ To investigate and remedy exposed inequities in the workplace, a bipartisan *Federal Glass Ceiling Commission* was created through Title II of the Civil Rights Act of 1991. Initially, the commission was charged with: (a) conducting a study of opportunities and artificial barriers to the advancement of minority men and all women into management and decision-making positions in corporate America; and (b) preparing written reports based on the study findings.

controlling for social capital, human capital, ability, motivation, and institutional characteristics? In the context of this study, the academic workforce includes both teaching faculty and academic leaders at American colleges and universities. To be sure, both groups (i.e., teaching faculty and academic leaders) examined in this study are faculty, but differ on their principal work function (detailed in the method section). The analysis is handled separately for each of the groups under investigation. We have chosen to focus our study on glass ceiling effects and race/ethnicity for three reasons: (a) lack of prior research on this topic; (b) glass ceiling effects criteria have not been used to understand employment disparities in the academic workforce; and (c) the glass ceiling framework may be a valuable research tool in understanding race-based discriminatory hiring practices.

Conceptual Framework

Glass Ceiling Criteria

As noted by other scholars (e.g., Cotter et al., 2001; Maume, 2004), a glass ceiling occurs when discrimination increases in severity with movement up the occupational hierarchy. As a result, inequality grows over the course of a person's career. It is also apparent when racial and gender inequality is observed after controlling for productivity-relevant factors. The studies mentioned above provide confirming evidence that the glass ceiling is a unique form of inequality, and that bias against people of color and women may be more severe later in the career than at labor market entry.

Cotter et al. (2001) proposed a four-prong empirical test to measure for the existence of a glass ceiling. It is these four criteria, which direct and give structure to the current inquiry. In fact, Cotter et al.'s (2001) work has formed the basis of other studies (e.g., Maume, 2004) seeking to understand glass ceiling effects. Accordingly, our study directly incorporates two of the criteria in discerning glass ceiling effects for senior-level position attainment in the academic workforce to understand employment disparities. First, a glass ceiling must represent a gender or racial difference that is not explained by other job-relevant characteristics of the employee. This criterion is satisfied in the current study through the use of social capital, human capital, and ability variables. Second, a glass ceiling effect is greater at higher levels of an outcome rather than lower levels. The current study sought to measure

this by utilizing data from six distinct employment groups, namely assistant, associate, and full professor and low-, mid-, and upper-level academic leader.

Criteria three and four require longitudinal data and thus, due to our data, are only casually referenced throughout the current study. For example, the third requirement is that glass ceiling effects reside in the chances of advancement into higher levels, not merely the proportion of individuals currently at those higher levels. Investigation into this type of discrimination requires the use of cohort data which is currently unavailable for higher education professionals on a national level. Lastly, the fourth criterion for a glass ceiling effect is that a disparity represents differences in advancement and opportunity that increase over the course of a career. Again, without the use of longitudinal data, this criterion remains unmeasured in the current study. While the third and fourth criteria are presently not measurable, results from criteria one and two will inform our discussion of glass ceiling effects with an eye toward understanding employment disparities in senior-level positions in the academic workforce.

Literature Review

While it is the work of Cotter et al. (2001) that guides this research on a methodological level, there is a modest body of research exploring the glass ceiling phenomena in society, and how the glass ceiling is manifest for people of color. Of particular concern for the current study is the presence of glass ceiling effects for people of color in higher education. The following literature review is a summary of this area of research.

The Glass Ceiling

The Federal Government began dedicating resources to address the glass ceiling phenomenon in the United States workforce in the early 1990s (Martin, 1991; Martin, 1992). These initial efforts were primarily concerned with remedying inequities in management positions within the corporate sector. However, these initiatives also brought national attention to the hiring practices that resulted in the current composition of the workforce, and as such, has served as a clarion call for researchers to examine race/ethnicity related issues in the workplace (Federal Glass Ceiling Commission, 1995a; Federal Glass Ceiling Commission, 1995b).

In recent years, demographic trends show slow, steady growth for people of color (Toossi, 2005). However, while these data are revealing of advancements for people of color in the U.S. workforce overall, these trends are not reflected in most senior-level positions (Athey et al., 2000; Burbridge, 1994; Johnsrud & Heck, 1994). According to Equal Employment Opportunity Commission (EEOC) statistics, the number of African Americans and Hispanics in management has quadrupled over recent decades and the number of Asians has increased eightfold (Morrison & Von Glinow, 1990). However, regardless of the successes reported by private research firms and industry studies, scholars (e.g., Ohlott, Ruderman, & McCauley, 1994; Maume, 2004) still cite the glass ceiling as a reality facing business people of color in senior-level management positions.

The concept of glass ceiling effects is generally viewed as a set of impediments and/or barriers to career advancement for women and people of color (Baxter & Wright, 2000; Morrison, White, & Van Velsor, 1987; Morrison & Von Glinow, 1990). These impediments and/or barriers span a constellation of variables that often materialize into conscious and sub-conscious discriminatory practices (S. Lee, 2002; Martin, 1991; Martin, 1992; Padavic & Reskin, 2002; Ridgeway, 2001). As such, organizational policies and practices which disproportionately and negatively impact people of color effectively create a "hidden" system of discrimination (Morrison & Von Glinow, 1990). Therefore, the glass ceiling is typically acknowledged as a subtle, transparent barrier that prevents the advancement of women and people of color to the upper echelons of power and responsibility in the workforce (Cleveland, Stockdale, & Murphy, 2000; Morrison & Von Glinow, 1990). Additionally, the presence of a glass ceiling is often not explainable by job-relevant qualifications of employees, or lack thereof. Rather, the glass ceiling may be a function of a multitude of forces: workplace social conditions, job requirements, and cultural biases (Cotter et al., 2001).

People of Color and Glass Ceiling Effects in the Higher Education Workforce

In parallel with the low representation for people of color in senior-level positions in the private industry and public sector, the number of people of color in senior-level positions in higher education remains low (Jackson, 2004; Jackson & Daniels, 2007). Research focused on people of color in these positions, coupled with demographic information on the

higher education workforce, demonstrates the dismal representation for these groups in senior-level positions (Chenoweth, 1998; Corrigan, 2002; Hill, 2004; Konrad & Pfeffer, 1991; J. Lee, 1997). Other studies have focused on employment trends for administrators of color in colleges and universities (Harvey, 1999; Johnsrud, 1991; Johnsrud & Heck, 1994). For example, people of color are not equal in terms of their professional standing compared to White males (e.g., levels of power, decision-making, and authority) in educational institutions (Ards et al., 1997; Fisher, Motowidlo, & Werner, 1993; Harvey, 1999; Johnsrud, 1991; Johnsrud & Heck, 1994). Researchers have further identified a “double-whammy” for African American women in higher education leadership positions. This term describes the reality that African American women often face two forms of institutionalized discrimination: sexism and racism (Chliwniak, 1997; Howard-Hamilton & Williams, 1996; Gorena, 1996; Singh, Robinson, & Williams-Greene, 1995; Wilson, 1989).

In searching for the effects of a glass ceiling on people of color in higher education, it becomes apparent that the glass ceiling manifests in multiple ways. Some of the more traditional forms of discrimination that have been associated with a glass ceiling include disparities in job position (e.g., rank, authority, and title), salary, promotion potential, and level of responsibility (as expressed through budgetary discretion and control) (Ards, et al., 1997; Athey, et al., 2000; Cotter, et al., 1999; Cotter, et al., 2001; Ginther & Hayes, 1999; Landau, 1995). However, there has been little research in each of these discrete areas as it specifically relates to people of color (see Ards, et al., 1997; S. Lee, 2002; Morrison & VonGlinow, 1990; Powell & Butterfield, 1997 for examples of research specifically on people of color). Partially due to the low representation for people of color in the academic workforce, it becomes difficult to unpack the multitudinous effects of a glass ceiling when a sample size is low and disbursed throughout various institution types. Accordingly, the current research seeks to expand this research by exploring the glass ceiling effects experienced by people of color in senior-level positions in the academic workforce, including both teaching faculty and academic leaders.

Method

In an attempt to understand differences in senior-level position attainment in the academic workforce based on race/ethnicity, logistic regression analysis was utilized with data from a national survey of

faculty in the United States. The dataset, variables, and analysis procedures are described in the next section.

Dataset

The National Center for Educational Statistics (NCES) designed and conducted the 1999 National Study of Postsecondary Faculty (NSOPF: 99) survey². NSOPF: 99 was conducted to address the need for national-level data on college faculty and instructors—those who directly affect the quality of teaching and learning at American postsecondary institutions (NCES, 2002). Therefore, NSOPF is the most comprehensive dataset on the academic workforce. The data collection occurred, during the academic year 1998-1999, which included 960 degree-granting postsecondary institutions and an initial sample of 31,354 faculty and instructional staff. Approximately 28,600 faculty and instructional staff were sent a questionnaire. Subsequently, a sub-sample of 19,813 faculty and instructional staff was drawn for additional survey follow-up. Approximately 18,000 faculty and instructional staff questionnaires were completed for a weighted response rate of 83%. The response rate for the institution survey was 93%. The weighted responses represent the national estimates for 1999 (957,767) (NCES, 2002). In order to correct for the non-simple random sample design and to minimize the influence of large sample sizes on standard errors, the effective sample size was altered by adjusting the relative weight downward as a function of the overall design effect (Thomas, Heck, & Bauer, 2005). This was achieved by multiplying the relative weight by the reciprocal of the DEFF value and then re-weighting the data with the DEFF adjusted relative weight.

Dependent Variables

The dependent variables for both teaching faculty and academic leaders were based on individual's responses to the modified primary activity question on the NSOPF: 99. The question asked: "What was your primary activity at this institution during the 1998 Fall term? If you have equal responsibilities, please select one." Responses were recoded to create three dummy variables for the academic workforce: (a) administration (i.e., academic leaders); (b) teaching; and (c) research. Faculty members contained within the administration category have assumed institutional positions committed to administrative functions

² NSOPF: 04 data could not be used for these analyses because the principal activity variable used for the academic leaders models was eliminated and thus not available.

(e.g., department chair, dean, and vice president of academic affairs). Faculty members categorized as teaching tend to represent the traditional tenured or tenure-track faculty (e.g., assistant, associate, and full professor) profile of a mix between teaching, research, service, and outreach. Lastly, the research category (e.g., research professor and research scientist) includes individuals who are for the most part in non-tenure track positions focused on research.

The dependent variables for teaching faculty by rank were based on individual's responses to the academic rank question on the NSOPF: 99. The question asked: "which of the following best describes your academic rank, title, or position at this institution during the 1998 Fall Term?" Responses were recoded to create three dummy variables for the teaching faculty: (a) full professor; (b) associate professor; and (c) assistant professor. These three options represent the professoriate trajectory through the tenure track ranks. Assistant professors are generally not tenured, but rather seeking tenure and promotion, and represent the point of entry for faculty. The associate professor position represents the mid-career point for tenure track faculty. Thus, having accumulated enough seniority and work production to be promoted from assistant professor, but still requiring more work production and seniority to achieve full professorship. Lastly, the full professor position represents the most senior-level rank, excluding special professorships (e.g., university, endowed, and named professors).

The dependent variables for academic leaders by level were based on individual's responses to the principal activity question on the NSOPF: 99. The question asked: "What was your principal activity at this institution during the 1998 Fall term? If you have equal responsibilities, please select one." Responses were recoded to create three dummy variables for academic leaders: (a) lower-level; (b) mid-level; and (c) upper-level positions. Faculty members contained within these administration categories have assumed institutional positions committed to administrative functions (e.g., department chair, dean, and vice president of academic affairs). First, lower-level were entry level positions (e.g., assistant director). Second, mid-level included positions such as academic dean and department chair. Third, senior-level included positions such as provost and president.

Independent Variables

In selecting independent variables, decisions were guided by research on social capital theory, human capital theory, ability measures, and motivation. Accordingly, the logistic regression models included 26 independent variables. The social capital measures included gender and race: (a) American Indian (White as referent group); (b) Asian; (c) African American; (d) Hispanic; (e) Native Hawaiian/Pacific Islander. The human capital measures included: (a) age (used as a proxy for experience); and (b) degree level. The ability measures included: (a) career publications; (b) external funding; (c) total number of grants; (d) teaching committees; and (e) administrative committees. The motivation measure included: (a) overall job satisfaction. Three human capital variables (i.e., years employed, teaching committees chaired, and administrative committees chaired) were removed from the original models because they were highly correlated with other variables. As such, age, teaching committee service, and administrative committee service were retained for the revised model.

Control Variables

Control variables for this study consisted of institutional variables. Institution location variables included: (a) New England region (mid west as referent group); (b) Mid East region; (c) Plains region; (d) South East region; (e) South West region; (f) Rocky Mountain region; and (g) Far West region. Carnegie classification variables included: (a) comprehensive institutions (research institutions as referent group); (b) doctoral institutions; and (c) liberal arts institutions. Institutional type variables included: two year institutions (four year institutions as referent group). Institutional control variables included: private institutions (public institutions as referent group). Total enrollment, was removed from the original model because it was highly correlated with another variable. Accordingly, Carnegie classification was retained in the revised model.

Analyses

Due to the dichotomous nature of the dependent variables, logistic regression³ was used to examine the extent to which social capital,

³ While multinomial logistical regression models allow for more than two discrete categories of outcomes, they remain unordered which does not make it the ideal analysis tool for the current study.

human capital, ability, and motivation measures explained the low observed representation for people of color in senior-level positions in the academic workforce (Cabrera 1994). Several measures of fit were used, when judging the significance of each logistic regression model: X^2 of the model, Pseudo R^2 , and PCPs. A significant X^2 indicates that the independent variable as a group correlate with the dependent variable. At most, the Pseudo R^2 represents the proportion of error variance in relation to a null model. PCP represents the percent of cases predicted by the model. PCPs higher than 55% signify a good fit for the model (Cabrera 1994). As a measure of the magnitude of effect, delta-ps were used, which represents the change in the probability in the dependent variable due to a change in the factor variable under consideration. For example, a delta-p value of 0.045 indicates that a one-unit change in the predictor is related to a 4.5 percentage point increase in the likelihood that a faculty member would become an academic leader.

Limitations of Study

There are several limitations for this study worth noting. First, the analyses for this study were limited to variables contained in NSOPF: 99. The NSOPF: 99 is the most comprehensive survey of the academic workforce and a rich data source; however, social capital, human capital, ability, and motivation measures were somewhat limited. While the 26 variables used for these analyses were applicable, other forms of social capital, human capital, ability, and motivation measures were not available. Second, analyses for this study were limited to cross-sectional data. Therefore, these results include members of the academic workforce employed during the year of data collection. In turn, implications of this study present one point in time and prevented the use of Cotter et al.'s (2001) criteria three and four. Third, a gender variable was intentionally excluded from this study. Therefore, the explanation of employment disparities regarding gender is a delimitation.

Fourth, cautions for strict interpretations of these models are warranted because of the potential challenges associated with the variation in the sample size of the various ethnic/racial groups. While NSOPF: 99 is a national data set and the most comprehensive data on professionals in the academic workforce, there is a significant gap between the number of

Whites and people of color in the data set. While these limitations are apparent in the present study, the results still provide a window for understanding the differential outcomes for people of color and Whites in the academic workforce.

Findings

Descriptive Results

Table 1 presents the descriptive data for the observed representation of primary activity for faculty by race/ethnicity. For all positions, Whites constituted the highest percentage regarding observed representation. Therefore, the remainder of this section will focus on the percentage distribution by rank among faculty of color. Regarding teaching faculty, African Americans were 5.18%, followed by Asians (3.96%), Hispanics (3.70%), American Indians (1.08%), and Native Hawaiian/Pacific Islanders (0.21%). As for academic leaders, African Americans were 6.41%, followed by both Asians and Hispanics with 2.70%, American Indians (0.84%), and Native Hawaiian/Pacific Islanders (0.17%).

Table 1

Observed Representation of the Primary Activity for Faculty by Race/Ethnicity: Fall 1998

	Race/Ethnicity					
	American Indian	Asian	African American	Hispanic	Native Hawaiian/Pacific Islander	White
Position						
Faculty	1.08%	3.96%	5.18%	3.70%	0.21%	85.87%
Academic Leaders	0.84%	2.70%	6.41%	2.70%	0.17%	87.18%
Assistant Professor	1.01%	8.71%	6.90%	3.36%	0.09%	79.93%
Associate Professor	0.82%	5.92%	5.46%	2.64%	0.46%	84.70%
Full Professor	0.55%	4.37%	2.94%	2.80%	0.20%	89.14%
Lower Level	2.32%	7.29%	7.29%	2.65%	low n	80.45%
Mid Level	1.06%	2.34%	5.94%	2.12%	0.21%	88.33%
Upper Level	low n	low n	5.88%	5.88%	low n	88.24%

Notes. Observed representation was based on the adjusted weighted sample.

As for the position of assistant professor, Asians were 8.71% of the observed representation, followed by African Americans (6.90%),

Hispanics (3.36%), American Indians (1.01%), and Native Hawaiian/Pacific Islanders (0.09%). Associate professor positions were similar in rank with Asians constituting 5.92%, African Americans (5.46%), Hispanics (2.64%), American Indians (0.82%), and Native Hawaiian/Pacific Islanders (0.46%). Lastly, full professor positions registered Asians with 4.37%, African Americans (2.94%), Hispanics (2.80%), American Indians (0.55%), and Native Hawaiian/Pacific Islanders (0.20%).

With regard to lower-level positions, both Asians and African Americans held 7.29% of these positions, followed by Hispanics (2.65%), American Indians (2.32%), and Native Hawaiian/Pacific Islanders did not hold any lower-level positions in 1998. Mid-level positions were slightly different with African Americans constituting 5.94%, Asians (2.34%), Hispanics (2.12%), American Indians (1.06%), and Native Hawaiian/Pacific Islanders (0.21%). Lastly, upper-level positions had only two ethnic and racial groups represented in 1998 other than Whites: African Americans (5.88%) and Hispanics (5.88%). For the most part, these data show a decrease in representation for people of color as they move through the ranks toward senior-level positions in the academic workforce.

Logistic Regression Results

This manuscript examined access to senior-level positions, both for teaching faculty and academic leaders, in higher education. The following results address the first and second criteria for the existence of a glass ceiling provided by Cotter et al. (2001). The third and fourth criteria could not be addressed because longitudinal data were not available for this study. Table 2 shows the results of two separate logistic regression models. Two separate models were specified for traditional employment categories in the academic workforce: (a) teaching; (b) administration (i.e., academic leaders). Each model reports the delta-p values for statistically significant variables. The column displays the statically significant delta-p values, which show the change in the probability of default⁴ that each significant variable makes controlling for all others. Based on the goodness of fit indices, the academic leaders' model is an excellent fit and the teaching faculty model is a good fit.

⁴ In the context of this study, the default probability is the senior-level position of interest for each model represented by the respective dependent variables.

Table 2

Logistic Regression Results for Teaching Faculty and Academic Leaders

Variable	Teaching Faculty Delta-p	Academic Leaders Delta-p
Individual Level Characteristics		
<i>Social Capital Variables</i>		
American Indian (White)		
Asian	0.0788***	0.0629*
African American		
Hispanic		
Native Hawaiian/Pacific Islander		
Gender		
<i>Human Capital Variables</i>		
Age		0.0018***
Degree Level		
<i>Ability Variables</i>		
Career Publications	-0.0006***	
Teaching Committees Served	0.0133***	-0.0027***
Administrative Committees Served	-0.0175***	0.0202*
External Funding	0.0000***	
Total Number of Grants	-0.0266***	
<i>Motivation Variables</i>		
Overall Job Satisfaction	-0.0196*	0.0180***
Institutional Level Characteristics		
<i>Control Variables</i>		
New England Region (Mid West)		
Mid East Region		
Plains Region		
South East Region		
South West Region		
Rocky Mountain Region		
Far West Region		
Comprehensive Institutions (Research)	-0.3333***	
Doctoral Institutions	-0.2059***	

Table 2 cont.

Variable	Teaching Faculty Delta-p	Academic Leaders Delta-p
Liberal Arts Institutions	-0.3553***	
Two Year Institutions (Four Year)	-0.2138***	0.0487***
Institutional Control (Public)	0.0330*	-0.0163*
Adjusted Weighted Sample	7226	7226
Estimate Population Size	957,767	957,767
P _o	0.7191	0.082
Model X ² , df	1008.611, 26	433.570, 26
Pseudo R ²	0.187	0.135
PCP	76.00%	91.80%

Note: Delta-p statistics are shown only for those variables whose coefficients were significant: *p<.05, **p<.01, ***p<.001

In the Teaching Faculty Model, the delta-p values indicate that there were 12 variables that generated significant effects in the probability of observed representation in positions with the principle function of teaching. As for social capital variables, being Asian (compared to White) increased the default probability. When considering the ability variables, more teaching committee served and more external funding increased default probability. In contrast, more career publications, more administrative committee served, and the more grants decreased default probability. Likewise, the motivation variable (i.e., overall job satisfaction) significantly decreased the default probability. Employment in the following institutional types (compared to research institutions): doctoral, comprehensive, liberal arts and two year (compared to four year institutions) institutions decreased the default probability. Lastly, employment at a private (compared to a public institution) increased the default probability.

The delta-p values for the Academic Leaders Model indicate that there were seven variables that generated significant effects in the probability of observed representation in positions with the principle function of administration. As for social capital variables, being Asian (compared to White) increased the default probability. In relation to human capital variables, age increased the default probability. Regarding ability variables, more teaching committees served decreased default probability and more administrative committees served increased default probability.

The motivation variable—overall job satisfaction significantly increased the default probability. Employment in two year (compared to four year institutions) institutions increased the default probability and employment at private (compared to a public institutions) institutions decreased the default probability.

Table 3 shows the results of three separate logistic regression models for Teaching Faculty by rank. Three separate models were specified for traditional employment ranks for tenure track faculty: (a) assistant professor; (b) associate professor; and (c) full professor. Each model reports the delta-p values for statistically significant variables. The column displays the statically significant delta-p values, which show the change in the probability of default that each significant variable makes controlling for all others. Based on the goodness of fit indices, these three models were a good fit.

Table 3
Logistic Regression Results for Teaching Faculty by Rank

Variable	Assistant Professor Delta-p	Associate Professor Delta-p	Full Professor Delta-p
Individual Level Characteristics			
<i>Social Capital Variables</i>			
American Indian (White)			
Asian	-0.0360**		
African American	-0.0426*		0.0990**
Hispanic			
Native Hawaiian/Pacific Islander		-0.0991*	
Gender		0.0239*	
<i>Human Capital Variables</i>			
Age	-0.0077***	0.0013**	0.1196***
Degree Level	0.0872***	0.0648***	0.1043***
<i>Ability Variables</i>			
Career Publications	-0.0022***	-0.0006***	0.0021***
Teaching Committees Served		0.0056**	0.0064***
Administrative Committees Served	0.0079***	0.0137***	0.0203***
External Funding			
Total Number of Grants	0.0068***	0.0066***	

Table 3 cont.

Variable	Assistant Professor Delta-p	Associate Professor Delta-p	Full Professor Delta-p
<i>Motivation Variables</i>			
Overall Job Satisfaction		-0.0201***	0.0421***
Institutional Level Characteristics			
<i>Control Variables</i>			
New England Region (Mid West)			-0.0626*
Mid East Region			-0.0361*
Plains Region	0.0451*		
South East Region			
South West Region			
Rocky Mountain Region			
Comprehensive Institutions(Research)			
Far West Region	0.0852***		
Doctoral Institutions			
Liberal Arts Institutions		0.0398*	
Two Year Institutions (Four Year)	0.0645***	0.0927***	
Institutional Control (Public)	-0.0202**		
Adjusted Weighted Sample	7226	7226	7226
Estimate Population Size	957,767	957,767	957,767
P _o	.1524	.1519	.2028
Model X ² , df	897.994, 26	610.943, 26	2185.217, 26
Psuedo R ²	.204	.141	.411
PCP	85.5%	84.7%	84.8%

Note: Delta-p statistics are shown only for those variables whose coefficients were significant: *p<.05, **p<.01, ***p<.001

In the Assistant Professor Model, the delta-p values indicate that there were eleven variables that generated significant effects in the probability of the observed representation in assistant professor positions. Considering social capital variables, being Asian (compared to White) and African American decreased default probability. In relation to human capital variables, age and degree level increased default probability. As for ability variables, more career publications decreased default probability and more administrative committee served and the more

grants increased default probability. Lastly, employment in the Plains region (compared to Mid West region) and Far West region increased default probability. Also, employment in two year institutions (compared to four year institutions) increased default probability and private institutions (compared to public institutions) decreased the default probability.

In the Associate Professor Model, the delta-p values indicate that there were eleven variables that generated significant effects in the probability of the observed representation in associate professor positions. Considering social capital variables, being Native Hawaiian/Pacific Islander (compared to White) decreased default probability and being female (compared to male) increased default probability. In relation to human capital variables, degree level and age increased probability. As for ability variables, more career publications decreased default probability and more teaching committees served, more administrative committee served, and more grants increased default probability. The motivation variable (i.e., overall job satisfaction) significantly decreased the default probability. Lastly, liberal arts institutions (compared to research institutions) increased default probability. Also, employment in two year institutions (compared to four year institutions) increased default probability.

In the Full Professor Model, the delta-p values indicate that there were nine variables that generated significant effects in the probability of the observed representation in full professor positions. Considering social capital variables, being African American (compared to White) increased default probability. In relation to human capital variables, age and degree level increased default probability. Relative to the ability variables, more career publications, more teaching committees served, and more administrative committee served increased default probability. The motivation variable (e.g., overall job satisfaction) significantly increased the default probability. Lastly, employment in the New England and Mid East regions (compared to Mid West region) decreased default probability.

Table four shows the results of three separate logistic regression models for Academic Leaders by rank. Three separate models were specified for traditional employment ranks for faculty assuming administrative positions: (a) lower-level; (b) mid-level; and (c) upper-level. Each model

reports the delta-p values for statistically significant variables. The column displays the statically significant delta-p values, which show the change in the probability of default that each significant variable makes controlling for all others. Based on the goodness of fit indices, these three models were an excellent fit.

Table 4
Logistic Regression Results for Academic Leaders by Level

Variable	Lower-Level Delta-p	Mid-Level Delta-p	Upper- Level Delta-p
Individual Level Characteristics			
<i>Social Capital Variables</i>			
American Indian (White)			
Asian	-0.0193*	0.0729*	
African			
American			
Hispanic			
Native Hawaiian/Pacific Islander			
Gender			0.0128*
<i>Human Capital Variables</i>			
Age		0.0019***	
Degree Level	-0.0150***		
<i>Ability Variables</i>			
Career Publications			
Teaching Committees Served	-0.0049**		-0.0012*
Administrative Committees Served	0.0032**	0.0160***	0.0020***
External Funding			0.0000*
Total Number of Grants			-0.0008*
<i>Motivation Variables</i>			
Overall Job Satisfaction		0.0120*	0.0040*

Table 4 cont.

Variable	Lower-Level Delta-p	Mid-Level Delta-p	Upper- Level Delta-p
Institutional Level Characteristics			
<i>Control Variables</i>			
New England Region (Mid West)			
Mid East Region			
Plains Region			
South East Region			
South West Region			
Rocky Mountain Region			
Far West Region			
Comprehensive Institutions(Research)	0.0475***		
Doctoral Institutions			
Liberal Arts Institutions			
Two Year Institutions (Four Year)	0.0645***	0.0368**	
Institutional Control (Public)	0.0171**		-0.0049***
Adjusted Weighted Sample	7226	7226	7226
Estimate Population Size	957,767	957,767	957,767
P _o	.0418	.0652	.0070
Model X ² , df	155.377, 26	386.798, 26	130.875, 26
Pseudo R ²	.072	.136	.225
PCP	95.8%	93.4%	99.3%

Note: Delta-p statistics are shown only for those variables whose coefficients were significant: *p<.05, **p<.01, ***p<.001

In the Lower-Level Model, the delta-p values indicate that there were seven variables that generated significant effects in the probability of the observed representation in lower-level positions. Considering social capital variables, being Asian (compared to White) decreased default probability. In relation to human capital variables, no doctorate (compared to doctorate) increased default probability. As for ability variables, more administrative committee served increased default probability and more teaching committee served decreased default probability. Lastly, employment in the comprehensive institutions (compared to research institutions) increased default probability. Likewise, employment in two year institutions (compared to four year

institutions) and private institutions (compared to public institutions) increased the default probability.

In the Mid-Level Model, the delta-p values indicate that there were five variables that generated significant effects in the probability of the observed representation in mid-level positions. Considering social capital variables, being Asian (compared to White) increased probability. In relation to human capital variables, age increased probability. As for ability variables, more administrative committee served increased default probability. The motivation variable—overall job satisfaction significantly increased the default probability. Lastly, employment in two year institutions (compared to four year institutions) increased default probability.

In the Upper-Level Model, the delta-p values indicate that there were seven variables that generated significant effects in the probability of the observed representation in upper-level positions. Considering social capital, being a female increased default probability. Regarding human capital variables, no variables were significant. As for ability variables, more administrative committees served and more external funding increased default probability. In contrast, more teaching committees served and the higher the total number of grants decreased default probability. The motivation variable—overall job satisfaction significantly increased the default probability. Lastly, employment in private institutions (compared to public institutions) decreased default probability.

Discussion

The logistic regression models, based on social capital, human capital, ability, and motivation measures employed in this study were designed to simulate career progression through the ranks for both teaching faculty and academic leaders in the academic workforce. The animating intent was to model, to the degree that is possible, important criteria and variables considered in both the hiring and promotion process—two points at which glass ceiling effects could be observed. While it is difficult for us to speak directly to glass ceiling effects due to data limitations, our findings provide new perspectives for understanding employment disparities by race/ethnicity. Statistically significant results emerged for each of the models; however, overall the magnitude of these variables was small. Nonetheless, at least five conclusions based on the

first two criteria for glass ceiling effects and exclusionary practices may be drawn from this study to understand our research question. Prior to discussing these observations, one cautionary note must be offered. These models are designed to control for appropriate individual and institutional variables, thus creating a “theoretical situation” that results in an equal scenario. Therefore, when considering significant results by race/ethnicity, it is important to remember that they do not apply to everyone within that particular race/ethnic category, but rather to those that have characteristics and attributes that align with the controls in these models.

First, Asians had the highest likelihood for observed representation, when compared to Whites, for both the teaching faculty and academic leader models. While evidence of career success for Asian faculty have been documented elsewhere (e.g., S. Lee, 2002), little previous research has focused on Asian academic leaders. Therefore, further research is needed to disaggregate the experiences of Asians in administrative positions in higher education. Second, these results suggest that people of color are least likely, in comparison to Whites, to be provided access to entry-level positions in the academic workforce, when controlling for social capital, human capital, ability, motivation, and institutional characteristics. In turn, fewer opportunities seem to be available for people of color to enter the academy as teaching faculty and academic leaders. Namely, Asians and African Americans were least likely to be assistant professors. Likewise, Asians were least likely to hold lower-level administrative positions. This finding is consistent with current debates and discussions about difficulties with the recruitment and retention for people of color in higher education (Cruse, 1994; Haro, 1990; Konrad & Pfeffer, 1991; Lindsay, 1997; Lindsay, 1999). While many theories have been suggested for the severe underrepresentation, the current findings may provide support for concerns regarding severe exclusionary practices as a real barrier to career entry for people of color in the academic workforce. If so, this finding is consistent with social closure theory in that the model suggests entry level positions for teaching and academic leadership are reserved for members of the dominant group. The above is purely speculation because data limitations did not permit a direct examination of this assertion.

Third, for certain people of color who are able to persevere through the initial stages of their career, delayed gratification appears to be possible

at the senior-level. That is, if holding the appropriate social capital, human capital, demonstrating appropriate ability, maintaining high job satisfaction, and employed in the appropriate context, people of color could have a higher likelihood of observed representation in senior-level positions. For example, if “all things were considered equal” in the decision making process, African Americans would most likely be full professors, compared to Whites. This finding is consistent with the vast body of qualitative research on women and people of color that have broken through the glass ceiling in higher education. While this qualitative research (e.g., Dawson, 1997; Easley, 1996; Fontaine & Greenlee, 1993; Johnson, 1998; Lindsay, 1994) has revealed strategies utilized by these individuals (e.g., mentoring and formal support networks, professional development opportunities, and individual strength of character), quantitative research providing support for these coping mechanisms has been lacking (for examples, see Bridges, 1996; Fontaine & Greenlee, 1993). The results from this study provide a critical link between the personal stories of success (e.g., Easley, 1996; Lindsay, 1994; Lindsay, 1999; Swisher, 2001; Watson, 2001) and statistical evidence that under certain conditions people of color successfully ascend to senior-level positions in the academic workforce.

Fourth, the results provide evidence that there is a change in outcomes from negative to positive as a person of color progresses through the ranks. For the most part, at both entry levels (i.e., assistant professor and lower-level), the race/ethnicity coefficients were negative. In contrast, the race/ethnicity coefficients changed direction and were positive starting at the mid-stages of the career and continued to be positive at the senior-level positions. While this finding certainly provides further evidence of the benefits of perseverance discussed above, they appear puzzling when compared with research claims that glass ceiling effects are additive and cumulative (Baxter & Wright, 2000; Cotter et al., 2001; Johnsrud, 1991; Johnsrud & Heck, 1994). An alternative hypothesis could be “lingering effects.” That is, the poor work-related experiences that occurred during the initial stages of the career changed the disposition toward their career and institution, and in turn, negatively affected job satisfaction and production.

Fifth, while the magnitude of the coefficients for this study was generally small, the significant coefficients for institutional level characteristics were much larger than individual characteristics. Therefore, the type of

institution at which a person of color is employed plays a significant role in career success and professional advancement. As noted in other areas of higher education and business management scholarship, the person-institution fit is a key factor in persistence and career success (Bretz & Judge, 1994; Ng & Burke, 2005).

Implications for Policy, Research, and Theory

The implications from this study are manifold and consistent with many recommendations made by other scholars regarding efforts to address employment disparities in order to increase the presence of people of color in senior-level positions in the academic workforce. First, the level of scrutiny for people of color seems to be highest at the point of entry and the earliest stages of one's career. This barrier may be mitigated by early-career interventions by institutions of higher education aimed at providing mentoring, support networks, and socialization to assist people of color as they transition at the institution and begin to assume greater levels of responsibility. Additional research is needed to discern what type and form of mentoring and support networks are most beneficial to people of color in the academic workforce to ensure success throughout one's career. For example, are simple interactions and career information enough, or can specific activities be proven to be more successful than others. Therefore, specific research geared toward better understanding the role of mentoring and social networks as professional development tools is warranted.

Second, graduate and early career socialization seems to be important components as it relates to success for people of color in senior-level positions. The negative effects manifested by early career barriers may be narrowed for people of color by providing opportunities as graduate students to be exposed to the values and expectations of the academic workforce. Likewise, as early career professionals providing clear expectations about what activities are valued most as it pertains to career trajectory would be beneficial. By developing and providing the appropriate training and professional socialization experiences for students, faculty, and academic leaders of color, institutions would do well in minimizing career barriers and creating appropriate work conditions.

Third, these data suggest that those in senior-level positions in the academic workforce have a high degree of job satisfaction. This result is

a particular challenge for people of color considering the body of work (e.g., Turner & Myers, 2000) that has documented their disenchantment with institutions of higher education, particularly predominantly White institutions. While the struggles facing people of color in the academic workforce will not likely disappear, looking inside oneself and to one's community for strength and personal resolve is a strategy that has been highly recommended (Dawson, 1997; Miller & Vaughn, 1997). Additional research may be required for institutions to discern organizational supports to encourage job satisfaction, whether they are interpersonal strategies such as career counseling, or institutional strategies such as celebrating professional accomplishments.

The data from this study not only support the glass ceiling framework, but also provide critical evidence of social closure theory in action. Best described as the "process of subordination whereby one group monopolizes advantages by closing off opportunities to another group of outsiders beneath it" (Murphy, 1988, p. 8), social closure embodies the glass ceiling phenomena. As such, this study provides additional implications for future theory development. Culturally speaking, the glass ceiling represents a threshold which, historically, women and people of color have been unable to overcome (Maume, 2004). Rather than viewing the glass ceiling from a deficit-model, one which presumes that the low number for people of color in senior-level positions is due to a lack of job relevant qualifications among job applicants, social closure affirms the ability of qualified individuals to transcend through the ranks to senior-level positions. Accordingly, social closure argues that it is a group of individuals actively invested in retaining positions of power and control for their own cohort that prevent ascension through the glass ceiling.

Social closure emphasizes that it is the exclusionary practices themselves which create segregation, both within organizations and individual jobs. It has been noted that these practices appear deliberate, and produce and perpetuate advantages for the dominant groups (Tomaskovic-Devey, 1993). Alternatively, social closure occurs when "opportunities are closed to outsiders and reserved only for members of our own group" (Tomaskovic-Devey & Stainback 2007, p. 56). Social closure is as much about protecting opportunities for the majority as it is about denying opportunities to others. Researchers (e.g., Tomaskovic-Devey & Stainback, 2007) have noted that a shared ethnicity, nationality, race, and

gender may form the basis of dominant group membership and in this sense social closure is similar to other forms of discriminatory practices. Similarly, social closure is also subsequently reinforced by the benefits and assets accrued by the members of that group through the exclusion of others (Tomaskovic-Devey & Stainback, 2007).

Measuring for the existence of glass ceiling effects is a natural extension of the social closure concept; it is one which implies that race-based strategies for maintaining power and control over opportunities and resources exist. Indeed, scholars have noted that social closure “suggests that status groups create and preserve their identity and advantages by reserving certain opportunities for members of the group” (Tomaskovic-Devey, 1993, p. 46). Since exclusion appears to be the preferred practice for retaining the hegemony of the dominant group, one implication of this theory as it pertains to the glass ceiling is that White males benefit most from exclusionary practices. As such, when measuring for glass ceiling effects, one can expect to see fewer effects in the culturally dominant group, and more effects for the excluded groups.

While increased demand for access to senior-level jobs by people of color is certainly a pressure for organizational change, the tendency of large, bureaucratic organizations (e.g., educational and governmental institutions) is to remain static (Cohen & March, 1974; Tierney, 1998; Weick, 1976). Organizations are inherently conservative entities in that they tend to simply reproduce and reinforce past behaviors rather than respond to the needs of their employees (Tomaskovic-Devey & Stainback, 2007). However, the social closure concept assumes that social boundaries and segregation are “less clearly demarcated where the cost to dominant groups is low or nonexistent” (Tomaskovic-Devey & Stainback, 2007, p. 57) thus creating the potential for incremental, longitudinal change. A second implication of social closure is that it is possible for institutional change to occur, but such change would only occur when the perceived “loss” to the dominant group is low.

A third implication of the social closure concept for the glass ceiling is the potential to uncover the existence of requisite, non-race-based characteristics and qualifications for membership to a dominant group. Theoretically speaking, strategies which seek to unsettle power imbalances would be successful if they duplicated or provided these characteristics and qualifications for the subordinate group. Accordingly,

strategies that have proved successful for the advancement of people of color in higher education: mentoring, networking, and professional training opportunities, all may serve as levers which hold the promise of elevating a member of the racial/ethnic subordinate group to that of the culturally dominant.

Conclusion

In conclusion, data from this study seem to suggest that exclusionary practices are still in place for people of color in the academic workforce, most notably at the point of career entry. During this phase for people of color at least four paths seem reasonable: (a) voluntary removal from the system (e.g., leave the academy); (b) mandatory removal from the system (e.g., denied promotion and tenure); (c) become disenchanted with career choice and institution (e.g., low morale and job performance); and (d) maintain a high level of job satisfaction during this phase which permits one to persevere. Accordingly, some ethnic and racial groups have found ways to mitigate the negative effects of exclusionary practices and chosen to stay on the path to senior-level positions attainment in the academic workforce. Therefore, the negative effects are different for certain groups at various stages of their career. This is particularly important because senior-level positions, which are positions of institutional control, seem to be accessible for those who had the appropriate professional background and were able to successfully jump through professional hurdles that are in place as one moves through the ranks. In turn, data seem to suggest that it is really difficult for people of color to gain access to entry level professional positions in the academic workforce, but once in the system opportunities are available.

In sum, our findings make several contributions to the concepts of glass ceiling effects and social closure. Most notably, our findings support the notion that it is much more difficult to exclude people of color from senior-level positions when they have accumulated the appropriate human capital, demonstrated high ability through merit-based performance, maintained a high level of job satisfaction, and have found a compatible match between person-institution fit. It should be noted that while our highly specified models holds human capital characteristics, ability variables, and job satisfaction variables constant, certain racial and ethnic groups are able to turn perceived disadvantages into career success. In turn, these findings help to explain why some people of color

enjoy success at the senior-level (i.e., break the glass ceiling), while others do not.

Concurrently, our models may be giving expression to exclusionary practices, most notably at the point of career entry. While this model assumes a rational decision maker is able to hold “all things equal” in an employment context, it is true that recruitment, hiring, and promotion decisions are not made in a model-like vacuum and individuals do adhere to subjective criteria when making personnel decisions. As such, it is important to remember that while the glass ceiling and social closure may be overcome in a theoretical setting, such as the one outlined above, the reality is that employment disparities persist in the higher education workforce and social closure operates to exclude the majority of people of color from senior-level positions in the academic workforce.

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