What Do We Know About Glass Ceiling Effects? A Taxonomy and Critical Review to Inform Higher Education Research

Jerlando F. L. Jackson · Elizabeth M. O'Callaghan

Abstract The concept of "glass ceiling effects" has emerged in social science research in general and higher education in particular over the past 20 years. These studies have described the impediments that women and people of color encounter in their quest for senior-level positions (e.g., CEOs) in society as glass ceiling effects. Literature, both empirical and non-empirical, has provided broad and varied interpretations of glass ceiling effects. In turn, the literature is less-than-settled on the application of glass ceiling effects. In this manuscript, the authors analyzed and critiqued 66 documents in order to advance theoretical and practical knowledge regarding glass ceiling effects in higher education.

Keywords Glass ceiling · Diversity · Discrimination · Gender inequities · Racial disparities

The concept of the "glass ceiling" has become increasingly embedded in the discourse and praxis of society (Coleman 1998). The core principles of a glass ceiling align with a contemporary movement to diversify senior-level positions in society by making advancements with regards to gender and racial/ethnic participation. Specifically, the concept of a glass ceiling is generally viewed as a set of impediments and/or barriers to career advancement for women and people of color (Baxter and Wright 2000; Morrison et al. 1987; Morrison and Von Glinow 1990). These impediments and/or barriers span a constellation of variables that materialize into conscious and sub-conscious discriminatory practices (Lee 2002; Martin 1991, 1992; Padavic and Reskin 2002; Ridgeway 2001). As such, this manuscript is focused on the myriad effects of the glass ceiling phenomena. It is precisely this issue—the multiplicity of effects—that underscores the rationale for the current literature review. Therefore, the animating intent of this manuscript is to synthesize "what we know about glass ceiling effects" research in

J. F. L. Jackson (✉) · E. M. O'Callaghan
University of Wisconsin-Madison, Madison, WI, USA
e-mail: jjackson@education.wisc.edu

order to advance the use of the concept to encourage higher education research on the topic.

Approximately 20 years have passed since the Federal Government has dedicated resources to addressing a probable glass ceiling in the United States workforce (Martin 1991; Martin 1992). These initial efforts were primarily concerned with inequities in management positions within the corporate sector. Most importantly, these initiatives brought national attention to the hiring practices that resulted in the composition of the workforce, and in turn, served as a clarion call for researchers to examine gender and race/ethnicity related issues in the workplace (Federal Glass Ceiling Commission 1995a, b). Interestingly enough, demographic trends show that the United States workforce is shifting to include more women than men, and slow steady growth for people of color (Toossi 2005). While these data are revealing of advancements for both women and people of color in the U.S. workforce, these trends are not reflected in senior-level positions in higher education (Athey et al. 2000; Burbridge 1994; Johnsrud and Heck 1994). It should also be noted that for women and people of color who do achieve these senior-level positions, they are disproportionately located in 2-year colleges and less prestigious 4-year institutions.

Likewise, diversity among students and faculty are not reflective of demographic shifts in society. For example, in 2006, women constituted 23% of all college presidencies (King and Gomez 2007), while female faculty comprised 53% of all faculty in 2005 (National Center for Education Statistics 2008), and female students accounted for over half (approximately 57%) of all college matriculants in 2005 (NCES 2008). People of color held 13.6% of college presidencies in 2006 (King and Gomez 2007), while according to the National Center for Education Statistics (2008) faculty of color comprised approximately 16% in 2005 and students of color comprised 31% of the total student body.

Despite these aforementioned trends and the national attention to glass ceiling effects, the related theoretical and empirical body of work is sporadic. One major reason for this occurrence is that existing research is not largely concentrated in one academic field, but rather across several. In turn, these inquiries are not consistent or comprehensive and do little to build a well defined understanding of a glass ceiling or its accompanying effects. Accordingly, it is timely to synthesize the social science literature to glean the collective knowledge from previous research. In light of the charge of the Glass Ceiling Commission and the need to crystallize knowledge to inform practice, this project is an attempt to review and synthesize existing scholarly research and discourse. In turn, the research questions for this manuscript are: (a) how much research on glass ceiling effects has been done since the formation of glass ceiling commission?; (b) what trends are evident across this body of research?; (c) what research questions have been addressed?; (d) what research topics have been emphasized? (e) what frameworks were used to guide studies?; (f) what research methods were employed?; and (g) what has been learned about glass ceiling effects?

To organize this review, we first provide a historical understanding of how the glass ceiling emerged as a concern in the United States. Next, we detail the review methods that describe how we managed the document search and analyzed the sample of documents. The next section presents the results of the review. The first section of the results details a taxonomy of the sample of documents. The second section presents a critical analysis of these documents. The concluding sections present implications of the review for future research, practice, and policy development.

The Emergence of Glass Ceiling Effects as a National Concern

History of the Concept

While undoubtedly used prior to the 1980s by feminists and those watchful of sexism in the workplace, the term "glass ceiling" was quickly incorporated into the lexicon of high-level female business leaders in corporate America after appearing in an article from the *Wall Street Journal* (Hymowitz and Schellhardt 1986). While the term was first coined to describe the experiences of women in corporate America, since the 1980s the Federal Government has recognized the existence of a glass ceiling which prohibited the advancement of women *and* people of color, among other disenfranchised groups, in the workplace. It is generally believed that it was not until this time period, and the involvement of the federal government, that the glass ceiling descriptor was applied to the discriminatory experiences of people of color. In 1987 the Department of Labor published a report *Workforce 2000* which brought widespread attention to the composition of the U.S. workforce, including the increased importance of men and women of all races as major contributors to the American economy. 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 [See Glazer-Raymo (1999) for more information on the history of the term and it's applicability to higher education].

Initially, the commission (chaired by the Secretary of Labor) was charged with conducting a study of opportunities and artificial barriers to the advancement of women and people of color into management and decision-making positions in corporate America. Concurrently, they were charged with preparing written reports based on the findings of this study. Four major publications were issued by the commission: (a) *A Report on the Glass Ceiling Commission; (b) Pipelines of Progress—A Status Report on the Glass Ceiling*; (c) *Good for Business: Making Full Use of the Nation's Human Capital*; and (d) *A Solid Investment: Making Full Use of the Nation's Human Capital* were published between 1992 and 1995. Each report consistently described and documented the existence of a glass ceiling for women and people of color in the United States labor force. The commission recognized the glass ceiling as an invisible barrier that confronts women and people of color as they approach the top of the corporate hierarchy. As the Federal Glass Ceiling Commission was focused on business leaders and capital ventures in the U.S. economy, the existence of glass ceiling effects in other sectors of the economy was not explored.

The U.S. Department of Labor reports that from 1979 to 2002, the proportion of women employed as managers, administrators, or executives nearly doubled and their earnings grew by 27% (Chao and Utgoff 2004). More specifically, women's participation in the category of managerial or professional specialty occupations grew from 22% in 1983 to 34% in 2002. However, the report makes special mention that these jobs remained highly segregated by traditional occupational standards with women predominantly in service-sector and care-taking occupations. The report also indicates that White women were more likely than women of color to work in managerial or professional specialty occupations. Thirty-five percent of White women, 26% of Black women, and 19% of Hispanic women held positions as managers, administrators, or executives (Chao and Utgoff 2004).

The Federal Glass Ceiling Commission described three classes of barriers for women and people of color in top level management. *Societal Barriers* describe the availability and quantity of educated women and people of color for particular positions and the differences that can be attributed to different groups of individuals as they relate to desired leadership characteristics. The second class of barriers are *Internal Structural Barriers*.

These barriers include a lack of outreach efforts on behalf of businesses to underrepresented populations, corporate climates that may not be tolerant of difference, and pipeline barriers which include a resistance to training and mentoring members of underrepresented groups for future promotions. The third class of barriers are described as *Government Barriers*. These barriers include a lack of monitoring and law enforcement on behalf of the government, weaknesses in data collection for descriptive analyses, and discussion and inadequate reporting on the existence of a glass ceiling.

The federal government has also tracked the progress of women and people of color in business. According to Equal Employment Opportunity Commission (EEOC) statistics, the number of women, Blacks, and Hispanics in management has quadrupled and the number of Asians has increased eightfold (Morrison and Von Glinow 1990). However, regardless of the successes reported by private research firms and industry studies, scholars (e.g., Ohlott et al. 1994; Maume 2004) still cite the glass ceiling as a reality facing businesswomen in the senior-level management positions. These trends hold true for people of color as well.

Perspectives on Glass Ceiling Effects

Previous research has documented the interplay between gender, race/ethnicity, and the glass ceiling in business and management organizations noting challenges and successes for women and people of color in senior-levels positions (Bartol et al. 2003; Morrison and Von Glinow 1990; Powell and Butterfield 1994). Relying on previous research in organizational management theory, two theories have attempted to explain glass ceilings in organizational contexts. First, institutional theories emphasize restrictive rules which maintain organizational stability over time (DiMaggio and Powell 1991; Frankforter 1996). Stability, typically buffered by policies and management hierarchies, can be seen as barriers to mobility for women and people of color by maintaining the organizational status quo wherein the cultural majority remains in positions of power and dominance. It may be argued that it is these same factors that perpetuate the glass ceiling. Second, social theories rely on cultural biases which define leadership and competence as masculine characteristics (Frankforter 1996; Powell 1988; Cox 1994). The implication is that women or people of color who do not model their leadership behavior after traditional White male styles of management will not be as successful or recognized for their effectiveness in the workplace (Frankforter 1996). Further complicating this issue is other studies (e.g., Bartol et al. 2003) which have concluded that in patriarchal organizations men view their perspectives and norms as being representative of gender-neutral organizational structures and assume the structure is asexual.

Researchers (e.g., Frankforter 1996; Morrison and Von Glinow 1990) have expanded on the social theory above to include a discussion of three major reasons for discriminatory practices, based on gender and race/ethnicity, in organizational contexts. First, a deficiency theory has been proposed that describes women and people of color as lacking qualities necessary for leadership (Morrison and Von Glinow 1990; Riger and Galligan 1980). These perceived deficiencies are the reason that they are treated differently by the majority. Second, overt discrimination by the majority culture is used to explain differential treatment (Morrison and Von Glinow 1990; Powell 1988). Lastly, structural theories describe systemic discrimination in which organizational policies and practices disproportionately and negatively impact women and people of color. These practices effectively create a "hidden" system of discrimination (Kanter 1977; Morrison and Von Glinow 1990; Riger and Galligan 1980), often called a "glass ceiling." However, it must be noted that there are

various other colorful terms used to describe the embedded, structural discrimination of women and people of color in organizations. These include the "concrete ceiling" (Ogilvie and Jones 1996), "sticky floor" (Padavic and Reskin 2002; Tesch et al. 1995) and "glass door" (Cohen et al. 1998). In addition, although not the focus of this current review, is the notion of tokenism, which has also been used to explain the rare presence of women and people of color in senior-level management positions. By holding a select group of individuals up as representatives, or tokens, of their gender or racial/ethnic group, organizations are able to present an atmosphere of fair hiring practices and equal opportunities (Cox 1990; Frankforter 1996; Kanter 1977). Nonetheless, the main focus of this review is to describe how, to-date, the concept of the glass ceiling has been understood and deployed in scholarly research.

The Glass Ceiling in Higher Education

Similarly, the glass ceiling in higher education has been explored using various methodologies (Glazer-Raymo 1999). Some studies focus on the proportional representation of women and people of color and use demographic information to provide data that shows the dismal representation for these groups in senior-level positions (Corrigan 2002; Hill 2004), while other studies focus on employment trends for women and administrators of color in colleges and universities (Harvey 1991; Johnsrud 1991; Johnsrud and Heck 1994). For example, the positions they held and the types of institutions where they are employed are provided as evidence to demonstrate that women and 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 et al. 1993; Harvey 1991; Johnsrud 1991; Johnsrud and Heck 1994). Policy-oriented approaches to addressing equity in the workforce examine how specific higher education organizations have successfully or unsuccessfully increased the representation of women and people of color on college campuses (Sagaria 1988). Researchers have also identified a "double-whammy" for African-American women in higher education leadership positions. This term describes the reality that African-American women belong to two groups which face discrimination: women and people of color (Chliwniak 1997).

   In relation to leadership within higher education, *The American College President Report* issued by the American Council on Education (ACE) reveals that while women hold 40% of all faculty and senior staff, only 21.1% of all college presidents are women. Additionally, 84% of presidents, 83% of business officers, and 75% of academic deans are male at colleges and universities (Corrigan 2002). Women in Higher Education also cites American Council on Education statistics which report on the racial diversity of women CEOs on college campuses.[1] Nine percent of CEOs on college campuses are African American, 2% are American Indian, 0.1% are Asian American, 5% are Hispanic, and 84% are White. Interestingly, a higher proportion of presidents of color are women compared to White presidents. Thirty-five percent of Hispanic presidents are women and 24% of African-American presidents are women, compared to 21% of White presidents. These data support the reality that people of color are underrepresented in leadership positions at colleges and universities as compared to national population-trend data, while simultaneously suggesting that there is a unique relationship between gender and race for people of color.

---

[1] http://www.wihe.com

Administrative salary data from ACE also reveals that women consistently lag behind men regarding compensation in senior-level administrative positions at all types of institutions. Bradburn et al. (2002) describes the salary gap that exists between male and female faculty. In 1998, full-time male faculty earned about $13,000 more than their female colleagues. Bradburn et al. (2002) also reported that female faculty were less likely to work at public doctoral, research, and medical institutions, hold full professorships, achieve tenure and hold doctoral or other terminal degrees than their male counterparts. Regarding race and ethnicity, Bradburn et al. (2002) reported some provocative findings. Asian/Pacific Islander faculty had higher average salaries, were more likely to hold advanced degrees, and had higher representation at public doctoral, research, and medical institutions as compared to White faculty. In contrast, African American faculty were found to have lower average salaries, were less likely to hold advanced degrees, or achieve full professor status or tenure than White faculty.

The ACE data suggest that as the number of colleges and universities increased from 1986 to 2001, so did the percentage of women presidents (Corrigan 2002). The percentage of women presidents doubled from 9.6% in 1985 to 21% in 2001, indicating that women are beginning to take a larger share of the existing leadership roles on college campuses (Corrigan 2002). The increase in representation of women as administrative and professional staff members in higher education has heightened the awareness of gender and has become a source of recent scholarship (Harvey 1999; Johnsrud and Heck 1994; Sagaria and Johnsrud 1991). However, other researchers (e.g., Cox and Nkomo 1990; Lindsay 1999; Opp and Gosetti 2002) have commented on the dearth of research focusing on women and administrators of color aside from national reports and specialized academic journals dedicated to particular ethnic groups. To be sure, the issue of whether there has been adequate study of the experiences of women and people of color in leadership positions in higher education is unsettled. In summary, the effects of the glass ceiling in higher education may be summarized as: (a) disproportionate representation; (b) disparities in compensation, rank, and position; and (c) implementation of support efforts. Other effects will be discussed in greater detail in the findings section.

Method

This manuscript reviews literature published on glass ceiling effects and provides a description of the nature and frequency of this research. In conducting this review, our intent was to provide a comprehensive view of this research, rather than a detailed account of specific findings. In line with the work on integrative reviews, this review provides "enriching perspectives on meanings and circumstances" that seek to, "break down boundaries, and cause things (or thinking) to expand" (Eisenhart 1998, p. 394). In order to provide a comprehensive review of the frameworks, methods, and findings from each of the 66 documents, this manuscript aggregates salient information from the 66 documents to create new knowledge. For example, this review takes a well-documented concept, the "glass ceiling" and seeks to enrich our scholarly understanding of the term by analyzing the historical context, the contemporaneous uses of the term, and the ways in which this term has infiltrated research literature. By comparing and contrasting the work from multiple areas,[2] (all grounded in the belief that they are discussing glass ceiling effects), we

---

[2] We would like to note that the comparison is not to suggest that conceptual and epistemological differences do not exist across fields and disciplines, but rather we want to identify unifying macro themes.

hope to aid in building a scholarly consensus on what a glass ceiling is and how it operates. Alternatively, it must be acknowledged that this outcome may not materialize, but a realization that no consensus on what a glass ceiling is exist. This current analysis of research also provides space for the discussion of policy implications and future research. As the intent is not to provide a detailed review of each research study, a description of the studies from this manuscript may be found elsewhere (see Jackson and O'Callaghan 2007).

Search Procedures

There were only 66 documents that met the criteria for inclusion at the time of this review. A three stage process resulted in this sample for review. First, six electronic databases were used to conduct searches: (a) ERIC database; (b) Proquest; (c) RDS Contemporary Women's Issues; (d) Academic Search/EBSCO; (e) HW Wilson (Education full-text); and (f) JSTOR. These databases were searched using the following terms: (a) *glass ceiling* and (b) *glass ceiling effect(s)*. The search included all published documents available through 2004. Our comprehensive search yielded 270 results. Second, abstracts were printed and screened by the researchers using the required inclusion criteria (i.e., document used glass ceiling to describe some form of workplace discrimination). At this stage, we were only concerned with documents that actually used the term glass ceiling. We did not use documents that did not attribute a glass ceiling to the form of discrimination studied. More specifically, manuscripts that did not include the phrase, "glass ceiling," but may be investigating or discussing gender or racial inequity in its various forms, were not included. The abstracts that were deemed appropriate were identified, and the full articles were read for potential inclusion. One-hundred and fifty-nine documents were read, and studies that did not meet the aforementioned standard for inclusion were removed. Third, to make certain all appropriate documents were included in this analysis, 20 experts from multiple research fields and/or disciplines who had published widely on related topics were consulted. These experts were sent the comprehensive list of documents and were asked to identify others that may have been omitted. The diverse group of experts ranged from policy experts, to senior-level administrators, to professors from various fields including business management, sociology, psychology and higher education. The experts suggested three publications which were ultimately included in the review. This search process resulted in a total of 66 usable documents for this analysis (see Appendix Table 1).

Analysis Procedures

The documents were analyzed in three phases. First, we conducted preliminary sorting of these articles in three fields and/or disciplines of study: (a) business; (b) education; and (c) social sciences. Next, we analyzed the documents by empirical versus non-empirical, purpose, scope, theoretical framework, workforce sector, level of position, type of diversity, research design, implications, and type of glass ceiling effect. In doing so, intentional efforts were made to uncover specific implications and outcomes from each document. In addition, special efforts were made to synthesize any uniform strengths or weaknesses/criticisms for these documents. The analysis procedures were managed using traditional approaches for empirical reviews (Galvan 2004; Miles and Huberman 1994). We based the synthesis of literature in our manuscript on an informal process of grouping works according to an artificial, though grounded, taxonomy that we see as key descriptors to organize and understand the literature (Strauss and Corbin 1990). Dividing the research in this way provides a heuristic to illuminate potential problems and opportunities for researchers in higher education.

Findings

The findings section is organized into two stages: (a) taxonomy of documents; and (b) critical review of documents. The first stage provides a descriptive categorization of documents according to the domains used to classify them. The second stage provides a critical analysis of documents based on the strengths and weaknesses of empirical and theoretical contributions.

Taxonomy of Documents

Each of the documents were reviewed and classified into domains: empirical versus non-empirical, purpose of study, work force sector, level of position, type of diversity, method of study, definition of glass ceiling, scope of study, theoretical framework, implications, and types of glass ceiling effects. These domains were selected because they form the basic criteria generally used to evaluate appropriate manuscript development and to evaluate the quality of research. Regarding empirical focus, the sample of documents was 45% empirical and 55% non-empirical. In the context of this manuscript, empirical documents report original data and analysis, and documents that presented theoretical-based arguments without the use of original data were classified as non-empirical. The purpose of study for these documents spanned across a breadth of topics within various employment industries (see Jackson and O'Callaghan 2007).

Documents analyzed for this study examined topics associated with three specific fields and/or disciplines of study: (a) business; (b) education; and (c) social sciences. The majority of these documents focused on business constituting 43.1% of the sample, followed by 32.3% in education, and 24.6% in the social sciences. Topics within these domains covered various areas including: college and university faculty, government officials, business managers, and the United States armed forces. As for the level of positions studied, approximately 7.3% focused on mid-level positions, 21.8% on senior-level positions, 9.1% on mixed levels, and 61.8% focused on promotional studies.[3] Some of the specific positions studied included: business owners, college presidents, college faculty, and captains in the Air force. For the most part, these documents focused on glass ceiling effects concerning diversity on two levels: gender and race/ethnicity. In turn, approximately 56.5% focused on gender, 3.2% on race/ethnicity, and 40.3% included both gender and race/ethnicity.

In an attempt to understand glass ceiling effects, authors of these documents employed either quantitative, qualitative, or mixed methods. That is, 81.8% of these documents used quantitative methods, 9.1% used qualitative methods, and 9.1% used mixed methods. A closer examination of these documents show the following as some of the methods used: ANOVA, ethnographic interviews, Chi-square, path analysis, hierarchical regression, logistic regression, Oaxaca decomposition, and OLS regression.

Curiously, in these documents focused on glass ceiling effects, only 73.8% provided an operational definition of the glass ceiling, while the remainder did not (26.2%) (see Appendix Table 2). Of the documents providing definitions, 47.9% attributed their operational definition to other authors. The vast majority of these studies (73.9%) relied on one particular definition, provided by Morrison and Von Glinow (1990). The remaining 52.1%

---

[3] In the context of this manuscript, promotional studies refer to those which analyze promotion patterns in particular organizations or follow individual cohorts as they ascend the employment hierarchy to increasing levels of responsibility, visibility, and power.

of these studies which provided definitions relied on their own, self-authored definition of a glass ceiling. Over half of the definitions provided by the studies utilized the words "barrier" or "obstacle" to describe a glass ceiling. Another 16.6% of the studies only used the words "glass ceiling" in their title or in the text as an impact term and did not provide a definition of the term. Of additional interest is that while the U. S. Government officially recognized a glass ceiling for women and people of color, only 33.3% of the definitions explicitly defined the glass ceiling in relation to race or ethnicity (i.e., included the words race, ethnicity, minority, or person of color in the definition).

In delineating the documents by scope of study, the majority of them utilized national datasets. Specifically, 9.1% examined a state system or international/national firm, 20.5% examined a single institution or firm, 6.8% used a random sample, 22.7% used a purposeful sample, 6.8% used a national random sample, and 34.1% used a national dataset. The vast majority of empirical studies were either focused on one educational institution or organization, or they relied on previously collected data to support their study.

Of the documents on glass ceiling effects, only 38.5% provided an explicit theoretical framework, while 61.4% did not. Of the frameworks noted, no two were the same. The scope of frameworks used in these studies are vast and contains theoretical underpinnings from economics, sociology, business administration, and psychological fields and/or disciplines. The variable "glass ceiling effects exist" was used to determine whether the analyzed documents clearly stated that a glass ceiling was evident operating to limit the opportunities of women and people of color. Approximately three-quarters (72.3%) of the documents concluded that glass ceiling effects exist, 23.1% concluded that glass ceiling effects did not exist, and 4.6% were inconclusive. The studies which were inconclusive did not state that glass ceiling effects exists, rather they noted support for the idea that barriers and obstacles exists for women and people of color.

Critical Review of Research

The critical review of these documents brings attention to the following areas of interests: (a) purpose of study; (b) subjects under review; (c) frameworks employed; (d) conclusions about glass ceiling effects; and (e) suggestions for remedies to the glass ceiling. The documents were analyzed in their respective fields and/or disciplines of study, but were compared and contrasted with respect to the aforementioned categories with studies from across the different fields and disciplines. The general strengths and weaknesses of the studies from each sector are discussed.

Education

The empirical studies in this area focused on researching and analyzing gender and race in higher education from a multitude of perspectives (Ards et al. 1997; Johnsrud 1991; Johnsrud and Heck 1994; Kahn 1993; Lee 2002; Tesch et al. 1995), including promotion (Bain and Cummings 2000; Ginther and Hayes 1999; Johnsrud 1991; Johnsrud and Heck 1994; Shultz et al. 1992) and salary studies (Fisher et al. 1993; Ginther and Hayes 1999; Johnsrud 1991; Johnsrud and Heck 1994). The focus of the studies ranged from faculty in wide-ranging disciplines (Ards et al. 1997; Fisher et al. 1993; Ginther and Hayes 1999; Kahn 1993; Tesch et al. 1995; Shultz et al. 1992; Tesch and Nattinger 1997) to administrators (Johnsrud 1991; Johnsrud and Heck 1994). In contrast, the non-empirical studies focused on the individual experiences of women and people of color in the academy (e.g., Chesterman et al. 2003; Harvey 1999), reviewing the literature on the representation of

women and people of color in academy (e.g., Chliwniak 1997; Glazer-Raymo 1999; Hagedorn and Laden 2002) and the role of mentoring in the advancement of women and people of color (Luna and Cullen 1995; Scanlon 1997).

Over half of the empirical studies focused on glass ceiling issues in a single institution (Johnsrud 1991; Johnsrud and Heck 1994; Shultz et al. 1992), while others relied on nationally representative data sets such as the Carnegie Foundation International Survey of the Academic Profession (Bain and Cummings 2000), the National Science Foundation Survey of Doctorate Recipients (Ginther and Hayes 1999; Kahn 1993), and the National Study of Postsecondary Faculty (Lee 2002) or samples gathered from national organizations such as the American Business Law Association (Fisher et al. 1993), and the Association of American Medical Colleges (Tesch et al. 1995).

The frameworks employed by the researchers in the education discipline are disparate; however, two studies rely on the concept of barriers to guide their inquiry (Coleman 1998; Bain and Cummings 2000). Some of the other frameworks identified include: gender stratification (Johnsrud 1991), homosocial reproduction (Johnsrud and Heck 1994), labor market rationales (Lee 2002), and racism (Lee 2002). The majority of the studies from this sector did not explicitly identify a guiding framework.

Collectively, the results from these studies support multiple, and at times contradictory conclusions about how a glass ceiling operates in education. Regardless of the explanations provided for why glass ceilings exist, this group is the most cohesive in its support of the existence of a glass ceiling. Only two studies contained mixed results in regards to whether a glass ceiling exists (i.e., Hagedorn and Laden 2002; Lee 2002). The remaining studies supported the existence of the glass ceiling, but in various forms and for various reasons. The findings from these studies, or alternatively their unique conception of a glass ceiling, includes the following: (a) that race is the most significant explanation for persistent differences in rank among faculty (Ards et al. 1997); (b) that differences in rank are largely to blame for the difference in salaries between male and female faculty (Ginther and Hayes 1999); (c) that the brevity of careers for female faculty causes inequalities (Bain and Cummings 2000); and (d) that pay differences between male and females are due to the number of years worked in the academy, not gender bias (Fisher et al. 1993). However, other studies (e.g., Ginther and Hayes 1999; Tesch et al. 1995) conclude that even after taking productivity, demographic characteristics, primary work activity, and differential attrition rates into account, substantial gender differences in promotion still exist. In particular, one study focused on female faculty documented that women, entering the job market directly after obtaining a Ph.D., are less likely to enter tenure-track faculty jobs and subsequently have a harder time and take longer to achieve tenure once they are in a tenure-track position (Kahn 1993).

The notion that the effect of gender bias is cumulative has gained empirical support (Johnsrud and Heck 1994). More specifically, the negative effects on career prospects, stemming from being female, increase over the course of a career. That is, the effects of gender stratification are additive in nature and disproportionately affect women the longer they persist in their careers. In other words, glass ceiling effects operates throughout a woman's career, and may get worse as her career grows. In regards to institutional support for females in their attempts to "break through" the glass ceiling, researchers have noted that women felt more personal obstacles and less institutional support in achieving their goals than their male peers (Shultz et al. 1992). In addition, research has documented that people of color have reported similar experiences (Morrison and Von Glinow 1990; Powell and Butterfield 1997). Some proposed solutions to alleviate the effects of a glass ceiling include more institutional support of women and people of color. These institutional

supports may take the form of a formal acknowledgement of a problem (Hill 2004), the establishment and support of mentoring programs (Luna and Cullen 1995; Scanlon 1997), increasing the representation of women on campus in senior positions (Chesterman et al. 2003; Corrigan 2002), and encouraging changes to institutional culture to be more accepting of women and people of color (Bain and Cummings 2000).

Business and Government

The documents from business and government covered broad topics such as how organizational characteristics/management (e.g., promotion structures) and personal attributes (e.g., gender and race) intersect to disadvantage particular individuals, resulting in glass ceiling effects. The empirical studies focused specifically on the effects of race (Powell and Butterfield 1997), gender (Baldwin 1996a; Powell and Butterfield 1994; Cohen et al. 1998; Davies-Netzley 1998; Ohlott et al. 1994; Powell and Butterfield 1997; Van Vianen and Fisher 2002) and the intersection of both race and gender (Athey et al. 2000; Bartol et al. 1981; Jacobs 1992; Landau 1995; Maume 2004). The number of studies from the business sector which focused on both race and gender is greater than that of the education sector.

The focus of these studies include salary and wage differentials, (Yamagata et al. 1997), the effects of diversity (gender and racial/ethnic) on organizational management, and promotion policies and mobility (Athey et al. 2000; Cohen et al. 1998; Landau 1995; Powell and Butterfield 1994, 1997). For example, one study examined the effects of re-organization efforts on diversity and whether they corresponded to real changes in power, control, and authority (as manifested by salary), or whether they simply reflected an appreciation for diversity without a simultaneous commitment ensuring diversity existed (Jacobs 1992).

The non-empirical and supporting documents for this sector include numerous literature reviews (Bell et al. 2002; Burbridge 1994; Cleveland et al. 2000; Inman 1998; Morrison and Von Glinow 1990; Weiler and Bernasek 2001), reports describing the work of the Department of Labor Glass Ceiling Initiative (Martin 1991, 1992), and government reports from the Federal Glass Ceiling Commission (Federal Glass Ceiling Commission 1995a, b).

The populations of interest in this category include the military (Bartol et al. 1981; Cohen et al. 1998) and female transport workers (Simpson and Holley 2001). Individuals at the 'management' level were analyzed in numerous studies (Bartol et al. 1981; Cohen et al. 1998; Davies-Netzley 1998; Jacobs 1992; Landau 1995; Ohlott et al. 1994; Van Vianen and Fisher 2002) and the workforce of the U.S. Federal Government was investigated in others (Powell and Butterfield 1994, 1997; Yamagata et al. 1997). The samples for the studies utilizing 'management' positions were drawn from the banking industry (Cohen et al. 1998) and multinational fortune 500 and fortune-100 companies (Landau 1995; Morrison et al. 1987).

The frameworks from this area of study include the role of optimal bias theory and type-based mentoring (Athey et al. 2000), person-organizational fit theories (Van Vianen and Fisher 2002), institutional sexism and discrimination (Baldwin 1996b; Cohen et al. 1998; Jacobs 1992; Morrison and Von Glinow 1990; Powell and Butterfield 1994), disparate impact theory (Baldwin 1996a), human capital theory (Baldwin 1996b), managerial leadership behavior theory (Bartol et al. 1981), critical mass theory (Jacobs 1992), triple jeopardy effect (Landau 1995), the Brunswick lens model (Powell and Butterfield 2002), occupational captivitiy theory (Yamagata et al. 1997), neoclassical economics (Weiler and Bernasek 2001) and glass ceiling effects (Maume 2004). As demonstrated by this vast list,

this sector shows the most variability with regards to theoretical approaches to studying the glass ceiling.

The results from this category indicate that while men and women may be present at similar organizational levels, women are not given the same amount of responsibility or supervisory tasks as males (Ohlott et al. 1994). The notion that a glass ceiling is a unique form of gender and racial bias against women and people of color, and that this bias is more severe at later stages of career development than at labor market entry was also affirmed (Maume 2004). However, a small number of the studies did not provide direct evidence of glass ceiling effects. These studies instead focused on other types of inequality, that mimicked a glass ceiling, yet presented real barriers for women and people of color nonetheless (Jacobs 1992; Powell and Butterfield 1994). For example, one study cited a "glass door" which must first be opened by a few women to allow others to pass through in the future (Cohen et al. 1998).

Some suggestions for minimizing glass ceiling effects from this body of research include supporting affirmative action programs and policies (Athey et al. 2000), making provisions for management training for women (Bartol et al. 1981) and supporting a critical mass of women at particular management levels to increase the likelihood of future promotions of women to those levels (Cohen et al. 1998). Still another study stated that uniform promotion and advancement policies and a strong "promote from within" organizational culture will help to remove persistent gender bias (Powell and Butterfield 1994).

Social Sciences

The vast majority of studies from this sector focuses only on gender, with a couple taking both race/ethnicity and gender into account for their analyses (Cotter et al. 1999, 2001). In addition, the goals and purposes of this group of studies are quite divergent. Some studies focused on promotions and organizational characteristics (Baxter and Wright 2000; Frankforter 1996; McDowell et al. 1999) while other focused on earnings (Cotter et al. 1999, 2001; Morgan 1998). Additionally, Cotter et al. (2001) provided a comprehensive operational definition of the glass ceiling. Specifically, this means a description of the conditions necessary for a gender bias or difference to be termed a "glass ceiling effect."

To date, the most concrete, systemic investigation into the existence of glass ceiling effects was conducted by Cotter et al. (2001). In addition, this study holds promise for extending a particular line of inquiry as it relates to the glass ceiling. In particular, this study should be highlighted as it lends guidance for further, systematic research on glass ceiling effects. For example, Maume (2004) adopted Cotter et al.'s (2001) methodology and applied it to a longitudinal study of women and African-American managers. The findings from this study indicate support for Cotter et al.'s claim that the glass ceiling is a unique and identifiable form of discrimination. The test developed by Cotter et al. (2001) is based on the premise that the glass ceiling is a specific type of gender or racial inequity that should be distinguished from other types of general discrimination. A glass ceiling exists when the following four criteria are met: (a) a gender or racial difference that is not explained by other job-relevant characteristics of the employee; (b) a gender or racial difference that is greater at higher levels of an outcome than at lower levels of an outcome; (c) a gender or racial inequality in the chances of advancement into higher levels, not merely the proportion of each gender or race currently at those higher levels; and (d) a gender or racial inequality that increases over the course of a career.

The non-empirical research from this sector includes supporting articles which focused on the role of stereotypes and beliefs (Chaffins et al. 1995; Ridgeway 2001), salary

differences (Kay and Hagan 1995), and the stratification of women in the workforce (Kay and Hagan 1995; Reskin 1988; Lemons 2003) and the resulting connections to a glass ceiling. A sizable number of these articles were primarily literature or research reviews (e.g., Chaffins et al. 1995; Chernesky 2003; Powell 1999; Reskin 1998; Ridgeway 2001; Padavic and Reskin 2002).

The data samples and theoretical frameworks for the empirical studies from the social sciences sector came from a variety of sources. These include data sets previously used in earlier research (Baxter and Wright 2000), unique combinations of existing data sets (Cotter et al. 1999), the Panel Study of Income Dynamics (Cotter et al. 2001), a random selection of corporations from the U.S. stock exchanges (Frankforter 1996), trade associations for American economists (McDowell et al. 1999), and surveys of social scientists and engineers (Morgan 1998). The frameworks utilized by the studies from this sector encompass scholarly traditions from a variety of disciplines. These include feminism, postmodernism and social constructivism (Buzzanell 1995), human capital theory, labor segmentation and Marxist analysis (Reskin 1988; Kay and Hagan 1995), gender schema theory (Lemons 2003), and expectation states theory (Ridgeway 2001).

Taken as a group, this set of studies exhibits the least amount of coherence in regards to sample and methods. There is also little agreement within this sector as to whether a glass ceiling effect exists. One-third of the studies found that while gender disparities do exist in relation to position attainment and promotion, these are attributable to differences other than gender (i.e., 'cohort effect' noted by Morgan 1998). In addition, for those studies which do cite evidence of a glass ceiling effects, little advice and few suggestions are offered for how to remedy the observed gender disparities.

Conclusion

The research questions guiding this inquiry were numerous and are re-visited here. That is, the aims of the current research were to understand: (a) how much research on glass ceiling effects has been done since the formation of glass ceiling commission?; (b) what trends are evident across this body of research?; (c) what research questions have been addressed?; (d) what research topics have been emphasized? (e) what frameworks were used to guide studies?; (f) what research methods were employed?; and (g) what has been learned about glass ceiling effects? To answer these research questions, we gathered a large amount of data in the form of previously published empirical and non-empirical research about glass ceiling effects. From the body of work reviewed, we determined that while there are a large number of sources which cite, discuss, and generally acknowledge a glass ceiling, there is relatively little empirical research devoted specifically to identifying and investigating glass ceiling effects. Our sampling of research questions also uncovered the fact that there is little coherence on how glass ceiling effects are identified and studied. However, it should be noted that this body of research does emphasize traditional measures of compensation (e.g., salary) and employment status (e.g., promotion rates) in the discussion of glass ceiling effects. The current research also employed various frameworks to guide these studies. In fact, the diversity among frameworks was so great, we could find only a few studies which were conducted with similar theoretical perspectives. The research methods employed by the studies also varied greatly. These included methods from both the quantitative and qualitative traditions, as well as from theoretical and non-empirical perspectives. In sum, we acknowledge that a great deal has been learned about glass ceiling effects in society from this body of work. However, there is little coherence on how best to

operationalize or measure glass ceiling effects and there is little agreement on the causes or origins for women and people of color (see Appendix Table 3 for a summary of the major conclusions from the review).

Implications for Higher Education Research

Over the last two decades researchers (e.g., Bain and Cummings 2000; Glazer-Raymo 1999; Reskin and Roos 1990) have expressed dismay that higher education is not more receptive to females and people of color rising in senior administrative roles as compared to other sectors of our economy, and unfortunately the reality is that women and people of color are still denied an equal share of the leadership positions in colleges and universities (Bain and Cummings 2000). Resulting from a review of the literature on glass ceiling effects in business, education, and social sciences, the following five observations emerged. While they are observations of the state of the literature in general, specific issues relating to higher education are highlighted. First, while the glass ceiling seems to be a common term in conversational discourse, little research has presented clear guidance for research and practice-based discourse. For example, there is little agreement on how to operationalize a single definition of a glass ceiling so that its effects may be studied in a uniform way. The exception to this statement is the study by Cotter et al. (2001) which outlines four explicit criteria that must be met to establish that a glass ceiling exists. This unfortunate fact also makes cross-sector comparisons difficult.

Second, empirical studies differed in populations, methodologies, and frameworks to such a degree that meaningful comparisons are difficult to assert, even within sectors. For example, within higher education a few studies focused on samples within a single institution (Johnsrud 1991; Johnsrud and Heck 1994; Shultz et al. 1992), while others utilized national data sets (Bain and Cummings 2000; Fisher et al. 1993; Ginther and Hayes 1999; Kahn 1993; Lee 2002; Tesch et al. 1995). The ability to make results generalizable from this group of studies is not readily apparent. In addition, the studies from higher education stem from different methodological approaches and frameworks, with the majority of them not identifying a dominant framework.

Next, there is a dearth of scholarship which aims to disentangle the ways that race/ethnicity and gender influence glass ceiling effects. Across all sectors, studies typically focused on gender, or the combined identities, or sources of discrimination, of race/ethnicity *and* gender. Very few studies focused solely on the effects of race/ethnicity and the glass ceiling. This finding is both troubling and surprising given institutions' of higher education commitment to racial/ethnicity equity on its campuses and the fact that the Department of Labor has explicitly identified the glass ceiling as a barrier for people of color. Some notable exceptions to this fact, across both empirical and conceptual scholarship are Ards et al. (1997); Hill (2004); Lee (2002); Powell and Butterfield (1997), all of whom primarily take race/ethnicity into account for their analyses.

Fourth, studies of the glass ceiling in higher education tend to utilize individual career histories, case studies, and individual career outcomes as the preferred methodological approach. There is a dearth of research focused on national employment trends for the academic workforce in general and senior-level administrators in particular. Two guiding studies for higher education scholarship are Cotter et al. (2001) and Maume (2004), both of which provide an explicit road map for scholars to follow during an investigation of glass ceiling effects. While the importance of qualitative research traditions is not minimized by

this observation, quantitative research methodologies have the ability to enhance and amplify the personal voices from individual stories of experiences with glass ceilings.

Lastly, research on the academic workforce in colleges and universities could benefit from a critical review of the research on organizational behavior in the business sector. National trend statistics seem to indicate that women are gaining representation in senior-level management and leadership positions in business at rates which exceed those in academia (Center for Women's Business Research 2004; Morrison and Von Glinow 1990). It would move the scholarly field further to uncover the reasons why this is the case and apply new, innovative solutions to the higher education workforce. These solutions may come in the form of organizational and workplace re-structuring or shifting of responsibilities to ensure a more equitable workforce overall.

Appendices

See Tables 1, 2, and 3.

Table 1 List of documents included in review by sector

Author and year
Business/government
Athey et al. (2000)
Baldwin (1996a)
Baldwin (1996b)
Bartol et al. (1981)
Burbridge (1994)
Bell et al. (2002)
Cleveland et al. (2000)
Cohen et al. (1998)
Davies-Netzley (1998)
Federal Glass Ceiling Commission (1995a)
Federal Glass Ceiling Commission (1995b)
Inman (1998)
Jacobs (1992)
Landau (1995)
Martin (1991)
Martin (1992)
Maume (2004)
Morrison and Von Glinow (1990)
Morrison et al. (1987)
Ohlott et al. (1994)
Powell (1999)
Powell and Butterfield (1994)
Powell and Butterfield (1997)
Powell and Butterfield (2002)
Simpson and Holley (2001)

Table 1 continued	Author and year
	Van Vianen and Fisher (2002)
	Weiler and Bernasek (2001)
	Yamagata et al. (1997)
	Education
	Ards et al. (1997)
	Bain and Cummings (2000)
	Braun (1995)
	Chanana (2003)
	Chesterman et al. (2003)
	Chliwniak (1997)
	Coleman (1998)
	Corrigan (2002)
	David and Woodward (Eds.) (1997)
	Fisher et al. (1993)
	Ginther and Hayes (1999)
	Glazer-Raymo (1999)
	Hagedorn and Laden (2002)
	Harvey (1999)
	Hill (2004)
	Johnsrud (1991)
	Johnsrud and Heck (1994)
	Kahn (1993)
	Lee (2002)
	Luna and Cullen (1995)
	Scanlon (1997)
	Shultz et al. (1992)
	Tesch et al. (1995)
	Social sciences
	Baxter and Wright (2000)
	Buzzanell (1995)
	Chaffins et al. (1995)
	Chernesky (2003)
	Cotter et al. (1999)
	Cotter et al. (2001)
	Di Palma and Topper (2001)
	Frankforter (1996)
	Kay and Hagan (1995)
	Lemons (2003)
	McDowell et al. (1999)
	Morgan (1998)
	Padavic and Reskin (2002)
Note: For full citation information refer to individual entries in reference list	Reskin (1988)
	Ridgeway (2001)

Table 2 List of documents included in review and source of glass ceiling definition

Study author and year	Definition of a "glass ceiling" provided?	Source of definition
Empirical studies		
Ards et al. (1997)	Yes	Original*
Athey et al. (2000)	Yes	Morrison and Von Glinow (1990); Spurr (1990); Bartlett (1997); Rothstein (1997)
Bain and Cummings (2000)	No	
Baldwin (1996a)	Yes	Original
Bartol et al. (1981)	Yes	Morrison and Von Glinow (1990)
Baxter and Wright (2000)	Yes	Morrison et al. (1987)
Cohen et al. (1998)	No	
Cotter et al. (1999)	No	
Cotter et al. (2001)	Yes	Original
Davies-Netzley (1998)	Yes	Original
Fisher et al. (1993)	Yes	
Frankforter (1996)	Yes	Morrison et al. (1987); Fagenson (1993); Cox (1994); Powell and Butterfield (1994)
Ginther and Hayes (1999)	No	
Glazer-Raymo (1999)	Yes	Klenke (1996)
Jacobs (1992)	Yes	Garland (1991)
Johnsrud (1991)	Yes	Morrison et al.(1987)
Johnsrud and Heck (1994)	Yes	Morrison et al. (1987)
Kahn (1993)	Yes	Original
Landau (1995)	Yes	Pettigrew and Martin (1987)
Lee (2002)	Yes	Original
Maume (2004)	Yes	Cotter et al. (2001)
McDowell et al. (1999)	Yes	Original
Morgan (1998)	Yes	Original
Ohlott et al. (1994)	Yes	Morrison et al. (1987)
Powell and Butterfield (1994)	Yes	Morrison et al. (1987)
Powell and Butterfield (1997)	Yes	Morrison et al.(1987)
Shultz et al. (1992)	Yes	Original
Tesch et al. (1995)	No	
Van Vianen and Fisher (2002)	Yes	Original
Yamagata et al. (1997)	Yes	Original
Non-empirical studies		
Baldwin (1996b)	No	Impact term
Bell et al. (2002)	Yes	Morrison and Von Glinow (1990); Federal Glass Ceiling Commission (1995a)
Braun (1995)	Yes	Original
Burbridge (1994)	Yes	Original
Buzzanell (1995)	Yes	Original

Table 2 continued

Study author and year	Definition of a "glass ceiling" provided?	Source of definition
Chaffins et al. (1995)	Yes	Morrison and Von Glinow (1990)
Chanana (2003)	No	Impact term
Chernesky (2003)	Yes	Morrison and Von Glinow (1990)
Chesterman et al. (2003)	No	Impact term
Chiliwniak (1995)	Yes	Original
Cleveland et al. (2000)	Yes	Morrison and Von Glinow (1990)
Coleman (1998)	Yes	Wall Street Journal
Corrigan (2002)	No	
David and Woodward (1997)	Yes	Morrison et al. (1987); Hansard Society (1990); Hearn et al. (1989); Buzzanell (1995)
Di Palma and Topper (2001)	No	Impact term
Federal Glass Ceiling Commission (1995a)	Yes	Wall Street Journal
Federal Glass Ceiling Commission (1995b)	No	
Hagedorn and Laden (2002)	Yes	Morrison et al. (1987)
Harvey (1999)	No	Impact term
Hill (2004)	No	Impact term
Inman (1998)	Yes	Original
Kay and Hagan (1995)	No	Impact term
Lemons (2003)	Yes	Morrison et al. (1987)
Luna and Cullen (1995)	Yes	Gilbert and Rossman (1992)
Martin (1991)	Yes	Original
Martin (1992)	No	
Morrison and Von Glinow (1990)	Yes	Original
Morrison et al. (1987)	Yes	Original
Padavic and Reskin (2002)	Yes	Original
Powell and Butterfield (2002)	Yes	
Powell 1999	Yes	Original
Reskin 1988	No	Impact term
Ridgeway 2001	Yes	Original
Scanlon 1997	Yes	Morrison et al. (1987); Federal Glass Ceiling Commission (1995a)
Simpson and Holley 2001	No	Impact term
Weiler and Bernasek 2001	Yes	Jackson (1998)

Note: In the context of this manuscript, empirical studies are those specifically designed to measure a glass ceiling effect. Non-empirical, or supportive, documents include articles, books, book chapters and reports that contribute to the scholarly understanding of glass ceilings, but are not designed to explicitly measure for a glass ceiling

* Original means that the definition of a glass ceiling which appeared in the document was written by the author of the document and no reference to an external source was present

Table 3 Summary table of major conclusions

Summary of major conclusions		
Research question	Conclusion	Evidence
How much research on glass ceiling effects has been done since the formation of glass ceiling commission?	A robust body of research has emerged.	Sixty-five documents were identified for review by this study.
What trends are evident across this body of research?	Multiple studies investigate the effects of a glass ceiling. Few studies attempt to empirically quantify or measure a glass ceiling. Additionally, there is little coherence in regards to how glass ceiling effects are identified and studied.	Seventy-three percent of reviewed documents provided an operational definition of the glass ceiling. Of the documents providing definitions, approximately half attributed their operational definition of a glass ceiling to other authors.
What research questions have been addressed?	Multiple and varied.	The majority of documents analyze the effects of a glass ceiling, rather than identifying or quantifying a glass ceiling. Studies typically looked at the differential impact of sexism and discrimination rather than investigating how a glass ceiling develops and is perpetuated.
What research topics have been emphasized?	Multiple and varied.	Documents analyzed for this study examined topics associated with three specific fields of study: (a) business; (b) education; and (c) social sciences. Topics within these domains covered various areas including: college and university faculty, government officials, business managers, and the United States armed forces.
What frameworks were used to guide studies?	Multiple and varied.	Of the documents on glass ceiling effects, only 38.5% provided an explicit theoretical framework, while 61.4% did not. Of the frameworks noted, no two were the same. The scope of frameworks used in these studies are vast and contains theoretical underpinnings from economics, sociology, business administration, and psychological disciplines.

Table 3 continued

Summary of major conclusions

Research question	Conclusion	Evidence
What research methods were employed?	Multiple and varied, including studies from both empirical and non-empirical traditions.	Approximately 81.8% of these documents used quantitative methods, 9.1% used qualitative methods, and 9.1% used mixed methods. A closer examination of these documents show the following as some of the methods used: ANOVA, ethnographic interviews, Chi-square, path analysis, hierarchical regression, logistic regression, Oaxaca decomposition, and OLS regression.
What has been learned about glass ceiling effects?	A great deal has been written about the effects of a glass ceiling, however little research has been dedicated to identifying and quantifying the existence of a glass ceiling.	The term "glass ceiling" is common in conversational discourse, however, there is little agreement on how to operationalize a single definition of a glass ceiling so that its effects may be studied in a uniform way.

References

Ards, S., Brintnall, M., & Woodard, M. (1997). The road to tenure and beyond for African American political scientists. *The Journal of Negro Education, 66*(2), 159–171.

Athey, S., Avery, C., & Zemsky, P. (2000). Mentoring and diversity. *The American Economic Review, 90*(4), 765–786.

Bain, O., & Cummings, W. (2000). Academe's glass ceiling: Societal, professional, organizational, and institutional barriers to the career advancement of academic women. *Comparative Education Review, 44*(4), 493–514.

Baldwin, N. J. (1996a). Female promotions in male-dominant organizations: The case of the United States military. *The Journal of Politics, 58*(4), 1184–1197.

Baldwin, N. J. (1996b). The promotion record of the United States Army: Glass ceilings in the Officer Corps. *Public Administration Review, 56*(2), 199.

Bartlett, R. (1997). Report on the committee on the status of women in the economics profession. *American Economic Review, 87*(2), 506–510.

Bartol, K. M., Anderson, C. R., & Schneier, C. E. (1981). Sex and ethnic effects on motivation to manage among college business students. *Journal of Applied Psychology, 66*(1), 40–44.

Bartol, K. M., Martin, D. C., & Kromkowski, J. A. (2003). Leadership and the glass ceiling: Gender and ethnic group influences on leader behaviors at middle and executive managerial levels. *Journal of Leadership & Organizational Studies, 9*(3), 8–20.

Baxter, J., & Wright, E. O. (2000). The glass ceiling hypothesis: A comparative study of the United States, Sweden, and Australia. *Gender and Society, 14*(2), 275–294.

Bell, M. P., McLaughlin, M. E., & Sequeira, J. M. (2002). Discrimination, harassment and the glass ceiling: Women executives as change agents. *Journal of Business Ethics, 37*(1), 65.

Bradburn, E. M., Sikora, A. C., & Zimbler, L. J. (2002). *Gender and racial/ethnic differences in salary and other characteristics of postsecondary faculty: Fall 1988, (NCES 2002–170)*. Washington, DC: U.S. Department of Education.

Braun, C. M. (1995). Affirmative action and the glass ceiling. *The Black Scholar, 25*(3), 7–26.

Burbridge, L. C. (1994). *The glass ceiling in different sectors of the economy: Differences between government, non-profit, and for-profit organizations*. Wellesley, MA: Wellesley College, Center for Research on Women.

Buzzanell, P. M. (1995). Reframing the glass ceiling as a socially constructed process: Implications for understanding and change. *Communication Monographs, 62*, 327–354.

Center for Women's Business Research. (2004). *Businesses owned by women of color in the United States, 2004*. Washington, DC: Author.

Chaffins, S., Forbes, M., Fuqua, H. E., & Cangemi, J. P. (1995). The glass ceiling: Are women where they should be? *Education, 115*(3), 380–386.

Chanana, K. (2003). Visibility, gender, and the careers of women faculty in an Indian university. *McGill Journal of Education, 38*(3), 381–389.

Chao, E. L., & Utgoff, K. P. (2004). *Women in the labor force: A databook (Report No. 973)*. Washington, DC: Department of Labor.

Chernesky, R. (2003). Examining the glass ceiling: Gender influences on promotion decisions. *Administration in Social Work, 27*(2), 13–18.

Chesterman, C., Ross-Smith, A., & Peters, M. (2003). Changing the landscape? Women in academic leadership in Australia. *McGill Journal of Education, 38*(3), 421–435.

Chliwniak, L. (1997). Higher education leadership: Analyzing the gender gap. *ASHE-ERIC Higher Education Reports, 25*(4), 1–97.

Cleveland, J. N., Stockdale, M., & Murphy, K. R. (2000). *Women and men in organizations: Sex and gender issues at work*. Mahwah, NJ: Erlbaum.

Cohen, L. E., Broschak, J. P., & Haveman, H. A. (1998). And then there were more? The effect of organizational sex composition on the hiring and promotion of managers. *American Sociological Review, 63*(5), 711–727.

Coleman, J. E. (1998, April 13–17). *Barriers to career mobility/advancement by African-American and Caucasian female administrators in Minnesota organizations: A perception or reality?* Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Corrigan, M. E. (2002). *The American college president*. Washington, DC: The American Council on Education Center for Policy Analysis.

Cotter, D. A., Hermsen, J. M., Ovadia, S., & Vanneman, R. (2001). The glass ceiling effect. *Social Forces, 80*(2), 655–681.

Cotter, D. A., Hermsen, J. M., & Vanneman, R. (1999). Systems of gender, race, and class inequality: Multilevel analyses. *Social Forces, 78*(2), 433–460.

Cox, T., Jr. (1990). Problems with organizational research on race and ethnicity issues. *Journal of Applied Behavioral Science, 26*(1), 5–23.

Cox, T., Jr. (1994). *Cultural diversity in organizations: Theory, research and practice*. San Francisco, CA: Berrett-Koehler, Publishers, Inc.

Cox, T., & Nkomo, S. (1990). Factors affecting the upward mobility of Black managers in private sector organisations. *Review of Black Political Economy, 18*(3), 39–48.

David, M., & Woodward, D. (Eds.). (1997). *Negotiating the glass ceiling—Careers of senior women in the academic world*. Washington, DC: Falmer Press.

Davies-Netzley, S. A. (1998). Women above the glass ceiling: Perceptions on corporate mobility and strategies for success. *Gender and Society, 12*(3), 339–355.

Di Palma, S. L., & Topper, G. G. (2001). Social work academia: Is the glass ceiling beginning to crack? *Journal of Women and Social Work, 16*(1), 31–45.

DiMaggio, P. J., & Powell, W. W. (1991). Introduction. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 1–38). Chicago, IL: The University of Chicago Press.

Eisenhart, M. (1998). An equivocal standard for women in science and engineering. *Anthropology Newsletter, 39*(4), 10–11.

Fagenson, E. A. (1993). *Women in management: Trends, issues and challenges*. Newbury Park, CA: Sage.

Federal Glass Ceiling Commission. (1995a). *Good for business: Making full use of the nation's human capital*. Washington, DC: U.S. Department of Labor.

Federal Glass Ceiling Commission. (1995b). *A solid investment: Making full use of the nation's human capital*. Washington, DC: U.S. Department of Labor.

Fisher, B. D., Motowidlo, S., & Werner, S. (1993). Effects of gender and other factors on rank of law professors in colleges of business: Evidence of a 'glass ceiling'. *Journal of Business Ethics, 12*(10), 771–778.

Frankforter, S. A. (1996). The progression of women beyond the glass ceiling. *Journal of Social Behavior and Personality, 11*, 121–132.

Galvan, J. L. (2004). *Writing literature reviews: A guide for students of the social and behavioral sciences* (2nd ed.). Needham Heights, MA: Simon & Schuster Customer Publishers.

Garland, S. B. (1991, August 19). Throwing stones at the glass ceiling. *Business Week, 29*.

Ginther, D. K., & Hayes, K. J. (1999). Gender differences in salary and promotion in the humanities. *The American Economic Review, 89*(2), 397–402.

Glazer-Raymo, J. (1999). *Shattering the myths: Women in academe*. Baltimore, MD: Johns Hopkins University Press.

Hagedorn, L. S., & Laden, B. V. (2002). Exploring the climate for women as community college faculty. *New Directions for Community Colleges,* (118), 69–78.

Harvey, W. B. (1991). *Minorities in higher education 2000–2001: Eighteenth annual status report.* Washington, DC: American Council on Education.

Harvey, W. B. (Ed.). (1999). *Grass roots and glass ceilings: African American administrators in predominantly White colleges and universities.* Albany, NY: SUNY Press.

Hill, F. (2004). Shattering the glass ceiling: Blacks in coaching. *Black Issues in Higher Education, 21*(4), 36–37.

Hymowitz, C., & Schellhardt, T. (1986, March 24). The corporate woman: A special report. *The Wall Street Journal,* Section 4, 1D–24D.

Inman, P. (1998). Women's career development at the glass ceiling. *New Directions for Adult and Continuing Education, 80*, 25–44.

Jackson, M. (1998, February 25). Women start own firms in frustration. *Denver Post.*

Jackson, J. F. L., & O'Callaghan, E. M. (2007). *The glass ceiling effect: A misunderstood form of discrimination [Annotated bibliography].* Milwaukee, WI: Institute on Race and Ethnicity, University of Wisconsin System.

Jacobs, J. A. (1992). Women's entry into management: Trends in earnings, authority, and values among salaried managers. *Administrative Science Quarterly, 37*(2), 282–301.

Johnsrud, L. K. (1991). Administrative promotion: The power of gender. *The Journal of Higher Education, 62*(2), 119–149.

Johnsrud, L. K., & Heck, R. H. (1994). Administrative promotion within a university: The cumulative impact of gender. *The Journal of Higher Education, 65*(1), 23–44.

Kahn, S. (1993). Gender differences in academic career paths of economists. *The American Economic Review, 83*(2), 52–56.

Kanter, R. (1977). *Men and women of the corporation.* New York: Basic Books.

Kay, F. M., & Hagan, J. (1995). The persistent glass ceiling: Gendered inequalities in the earnings of lawyers. *The British Journal of Sociology, 46*(2), 279–310.

King, J., & Gomez, G. (2007). *The American college president: 2007 Education.* Washington, DC: American Council on Education.

Klenke, K. (1996). *Women and leadership: A contextual perspective.* New York: Springer.

Landau, J. (1995). The relationship of race and gender to managers' ratings of promotion potential. *Journal of Organizational Behavior, 16*(4), 391–400.

Lee, S. M. (2002). Do Asian American faculty face a glass ceiling? *American Educational Research Journal, 39*(3), 695–724.

Lemons, M. (2003). Contextual and cognitive determinants of procedural justice perceptions in promotion barriers for women. *Sex Roles, 49*(5/6), 247–264.

Lindsay, B. (1999). Women chief executives and their approaches towards equity in American universities. *Comparative Education, 35*, 187–199.

Luna, G., & Cullen, D. L. (1995). Empowering the faculty: Mentoring redirected and renewed. *ASHE-ERIC Higher Education Reports, 3*, 1–87.

Martin, L. (1991). *A report on the glass ceiling commission.* Washington, DC: U.S. Department of Labor.

Martin, L. (1992). *Pipelines of progress—A status report on the glass ceiling.* Washington, DC: U.S. Department of Labor.

Maume, D. J., Jr. (2004). Is the glass ceiling a unique form of inequality? Evidence from a random-effects model of managerial attainment. *Work and Occupations, 31*(2), 250–274.

McDowell, J. M., Singell, J., Larry, D., & Ziliak, J. P. (1999). Cracks in the glass ceiling: Gender and promotion in the economics profession. *The American Economic Review, 89*(2), 392–396.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* Thousand Oaks, CA: Sage.

Morgan, L. A. (1998). Glass-ceiling effect or cohort effect? A longitudinal study of the gender earnings gap for engineers, 1982 to 1989. *American Sociological Review, 63*(4), 479–493.

Morrison, A. M., & Von Glinow, M. A. (1990). Women and minorities in management. *American Psychologist, 45*(2), 200–208.

Morrison, A. M., White, R. P., & Von Velsor, E. (1987). *Breaking the glass ceiling: Can women reach the top of America's largest corporations?.* Reading, MA: Addison-Wesley.

National Center for Education Statistics. (2008). *Digest of education statistics, 2007 (NCES 2008-022).* Washington, DC: U.S. Department of Education.

Ogilvie, D., & Jones, K. (1996, September 25–29). *African American women executives' communications strategies: Using the power of the word to break through concrete ceilings.* Paper presented at the 18th Annual National Black MBA Association, Inc. National Conference, New Orleans, Louisiana.

Ohlott, P. J., Ruderman, M. N., & McCauley, C. D. (1994). Gender differences in managers' developmental job experiences. *The Academy of Management Journal, 37*(1), 46–67.

Opp, R. D., & Gosetti, P. P. (2002). Equity for women administrators of color in 2-year colleges: Progress and prospects. *Community College Journal of Research and Practice, 26*, 591–608.

Padavic, I., & Reskin, B. (2002). *Men and women at work*. Thousand Oaks, CA: Pine Forge Press.

Pettigrew, T. F., & Martin, J. (1987). Shaping the organizational context for Black American inclusion. *Journal of Social Issues, 43*(1), 41–78.

Powell, G. N. (1988). *Men and women of the organization*. Newbury Park, CA: Sage.

Powell, G. N. (1999). Reflections on the glass ceiling: Recent trends and future prospects. In G. N. Powell (Ed.), *Handbook of gender and work*. Thousand Oaks, CA: Sage.

Powell, G. N., & Butterfield, D. A. (1994). Investigating the glass ceiling phenomenon: An empirical study of actual promotions to top management. *The Academy of Management Journal, 37*(1), 68–86.

Powell, G. N., & Butterfield, D. A. (1997). Effect of race on promotions to top management in a federal department. *The Academy of Management Journal, 40*(1), 112–128.

Powell, G. N., & Butterfield, D. A. (2002). Exploring the influence of decision makers' race and gender on actual promotions to top management. *Personnel Psychology, 55*, 397–428.

Reskin, B. (1988). Bringing the men back in: Sex differentiation and the devaluation of women's work. *Gender and Society, 2*(1), 58–81.

Reskin, B. (1998). *The realities of affirmative action in employment*. Washington, DC: American Sociological Association.

Reskin, B. F., & Roos, P. A. (Eds.). (1990). *Job queues, gender queues: Explaining women's inroads into male occupations*. Philadelphia, PA: Temple University Press.

Ridgeway, C. L. (2001). Gender, status and leadership. *Journal of Social Issues, 57*(4), 637–655.

Riger, S., & Galligan, P. (1980). An exploration of competing paradigms. *American Psychologist, 35*, 902–910.

Rothstein, D. (1997). *Supervisor gender, race, and ethnicity and the labor market outcomes of young workers*. Washington, DC: U.S. Bureau of Labor Statistics.

Sagaria, M. (1988). Administrative mobility and gender: Patterns and processes in higher education. The *Journal of Higher Education, 59*, 305–326.

Sagaria, M., & Johnsrud, L. (1991). Administrative promotion: The structuring of opportunity within a university. *Review of Higher Education, 15*(2), 191–211.

Scanlon, K. C. (1997). Mentoring women administrators: Breaking through the glass ceiling. *Initiatives, 58*, 39–53.

Shultz, E., Montoya, A. L., & Briere, P. M. (1992). *Perceptions of institutional climate*. Kutztown, PA: Kutztown University.

Simpson, R., & Holley, D. (2001). Can restructuring fracture the glass ceiling? The case of women transport and logistics managers. *Women in Management Review, 16*(4), 174–182.

Spurr, S. J. (1990). Sex discrimination in the legal profession: A study of promotion. *Industrial and Labor Relations Review, 43*(4), 406–417.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tesch, B. J., & Nattinger, A. (1997). Career advancement and gender in academic medicine. *Journal of Irish Colleges of Physicians and Surgery, 26*(July), 172–176.

Tesch, B. J., Wood, H. M., Helwing, A. L., & Nattinger, A. B. (1995). Promotion of women physicians in academic medicine: Glass ceiling or sticky floor? *Journal of the American Medical Association, 273*(13), 1022–1025.

Toossi, M. (2005). Labor force projections to 2014: Retiring boomers. *Monthly Labor Review, 128*(11), 25–44.

Van Vianen, E. M. A., & Fischer, A. H. (2002). Illuminating the glass ceiling: The role of organizational culture preferences. *Journal of Occupational and Organizational Psychology, 75*, 315–337.

Weiler, S., & Bernasek, A. (2001). Dodging the glass ceiling? Networks and the new wave of women entrepreneurs. *Social Science Journal, 38*(1), 85–104.

Yamagata, H., Yeh, K. S., Stewman, S., & Dodge, H. (1997). Sex segregation and glass ceilings: A comparative statics model of women's career opportunities in the federal government over a quarter century. *The American Journal of Sociology, 103*(3), 566–632.