Unconscious Bias: An Investigation of the Impact of Applicant Race on Curriculum Vita Review

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ABSTRACT

Diversity efforts have a long history on college campuses but faculty diversity efforts have experienced limited success (Smith, Turner, Osei-Kofi & Richards, 2004; Turner, 2002). While there is an abundance of literature exploring the challenges in achieving faculty diversity, there have been very few empirical studies exploring the actual search process. The limited research available regarding race suggests that traditional search processes do not result in hiring applicants of color (Smith et al., 2004) but there is no research that identifies factors that might be addressed to produce a more equitable search process. The purpose of this study is to identify which factors come into play when reviewing a vita. Of particular interest is the influence applicant race, as indicated by applicant name, has on the evaluation of the curriculum vita. A national sample was identified using the membership list of the Council of Industrial Engineering Academic Department Heads. A between subjects design was utilized. Participants were sent the curriculum vita of a Black applicant or a White applicant, a brief survey questionnaire and a self-addressed stamped envelope. All responses were anonymous. Data were analyzed using analysis of variance to determine if there is variance in responses to survey items based on applicant race. Demographic characteristics of the participants influenced the evaluation of the fictitious candidate. Participate age and participant race influenced candidate evaluation. There was evidence of same-race rating effect in which Black participants favored the Black applicant and White participants favored the White applicant. Findings suggest applicant race does influence the evaluation of a curriculum vita when the eligibility criteria is valued by the evaluator and candidate qualifications are ambigious.

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Chapter One: Introduction to the Study

Background and Rationale

Diversity efforts have a long history on college campuses. Although the landmark 1954 case Brown v. the Board of Education mandated the immediate desegregation of all educational institutions, predominantly White college campuses were slow to integrate students of color (Ball, 2000). Student diversity efforts were enhanced through activism in the 1960s and civil unrest urging higher education to take more radical action to increase the representation of minority students (Ball, 2000; Bowen & Bok, 1998). A surge in Black student enrollments can be attributed to Brown v. the Board of Education (Astin, 1982).

In 1965, President Lyndon Johnson implemented Executive Order 11246 that required government contractors and subcontractors to develop affirmative action programs with plans, goals and timetables, to include minorities in the workforce (Ball, 2000). Many higher education institutions were subject to these regulations.

In spite of all of these societal changes, faculty diversity continues to be a challenge. Many institutions have seen student diversity increases (Trower & Chait, 2002) and these increases make the lack of progress diversifying the faculty ranks more apparent as the student population on our campuses is more diverse (Antonio, 2002). These challenges have resulted in many institutions voicing concern over the representation of minorities in faculty positions. Along the way there have been minimal increases in the representation of minority faculty but some believe the gains have been slow at best (Moody, 2005; Turner, 2002).

As higher education struggles to find answers, some have questioned if myths and negative beliefs about minorities in higher education create a vicious cycle of unfulfilled diversity hiring objectives (Moody, 2004; Swoboda, 1993). While an abundance of literature has explored the challenges in achieving faculty diversity, there have been very few empirical studies exploring the actual search process.

The limited research available regarding race of the faculty applicant suggests that traditional search processes do not result in hiring applicants of color (Smith et al., 2004). This suggests that the traditional search process is potentially flawed but current literature has not explored empirically the limitations in the candidate evaluation process.

Statement of the Problem and Study Purpose

The problem for this study was the lack of empirical research regarding the factors influencing evaluation of candidates for tenure-track faculty positions. In particular, very little was known regarding the role applicant race may have as one of the potential factors influencing the evaluation of candidates. This researcher proposed to address this problem through an empirical study utilizing a national sample to explore these factors. The purpose of the study was to determine the factors that influence faculty when they are reviewing a curriculum vita for a tenure-track faculty position. Of particular interest was the influence that an applicant's race has on the evaluation of the curriculum vita. An additional purpose of the study was to inform those responsible for hiring decisions as to the factors that may consciously and unconsciously influence those decisions. It was hoped that through research, higher education would be able to provide greater clarity, consistency, and equity to their hiring processes. The research question was: Does applicant race influence the evaluation of candidates for tenure-track faculty positions?

Definition of Terms

Some language used within this document represents terminology which is specific to higher education and government contractors. It is important to define the terms used within the context of this document to ensure that all readers have a common understanding of the referenced concepts. Definitions of those concepts are as follows:

Affirmative action – A set of public policies that require federal contractors or subcontractors to take extra effort to ensure equal employment opportunity for women, minorities, veterans and persons with disabilities (U.S. Department of Labor, 2002).

Pipeline – Through education, individuals can be provided access to influential positions. The movement and transition points through the educational system can be considered a pipeline (Astin, 1982). For the purposes of this study the pipeline represents the number or availability of doctorate holders in a particular discipline who would potentially be eligible for hire in a tenure track faculty position. The pipeline definition for this study also includes the requisite transition points these individuals must pass through to obtain the doctorate.

Stereotypes – "Images within a category invoked by the individual to justify prejudice" (Allport, 1954, p. 189).

Stereotype threat – A condition in which a negative stereotype regarding a group impacts the performance of individuals representing that group (Steele, 1997).

Unconscious bias – A term used by this researcher to capture the body of literature that explores more subtle forms of racism. It represents the application of stereotypes in evaluative contexts but an individual lacks awareness that a stereotype has influenced the assessment (Devine, 2001; Dovidio & Gaertner, 1996; 2000; Lindsay 1997; McConahay, 1983).

Underrepresented minorities – Astin (1982) found losses of Hispanics, Blacks and Native Americans at almost every transitional point in the educational pipeline resulting in these groups not being represented at the rates expected. These groups have been labeled as underrepresented minorities. This study will focus on underrepresented minorities in higher education.

Limitations of the Study

Although a national sample was utilized for this study, the study focused on a specific discipline within engineering, industrial engineering. Limiting the sample to a discipline within engineering could be viewed as a limitation to the study. Attempts within the sampling design were taken to garner a sample that would be representative of the different institutions that have this particular engineering program. The sample was not restricted to institutions that have graduate engineering programs and institutions that only had baccalaureate programs were included. It was hoped that the strategies employed in the sampling design would result in the institutions in the sample also being representative of the different institutions within higher education. Consumers of this research can review the findings and determine if they are applicable to their setting.

Summary

This researcher has provided a foundation for this study through exploring the background of diversity efforts within higher education. The research question was formulated to identify the factors in the search process that may contribute to the limited success of faculty diversity efforts. While there were potential limitations within the study, it was hoped that the proposed sampling strategy utilizing a national sample minimized the limitations.

Chapter Two: Review of the Literature

The purpose of this chapter was to review relevant literature to provide a context and foundation for the research question. Relevant literature included an understanding of the value of diversity within higher education and specifically the importance of minority representation within the faculty ranks at institutions of higher education. Demographic diversity within the United States and all facets of higher education were explored to provide clarity on the current status of diversity within higher education. Next, literature was highlighted identifying the impact of stereotypes and bias to provide a foundation of how these constructs operate and impact decision-making. Finally, the review of the literature focused on race effects on hiring from a general perspective and narrowed in on the more unique aspects of faculty hiring.

Importance of Faculty Diversity

Diverse faculty members make an important contribution to academic environments. One contribution is the impact these individuals can have on students. Alger (2003) and Moreno (2003) suggested student learning and student development benefit when students are educated in diverse environments. Smith (1989) believed that curriculum and pedagogy are enhanced through diversity as different perspectives affect what is taught, provide new thoughts on ways in which to teach (Astin, 1982), and provide new ideas about which aspects of the educational environment foster student learning (Smith, 1989). Diverse environments help students to challenge stereotypes and enhance critical thinking through exposure to difference (Milem & Hakuta, 2002). The intellectual engagement in the classroom with individuals of different backgrounds promotes this enhanced critical thinking (Milem, 2003). Faculty of color further intensifies this effect due to their tendency to use more active teaching methods which promote greater levels of interaction between students (Milem, 2003; Milem & Hakuta, 2002).

Some may believe that diversity only benefits diverse individuals but Bowen and Bok (1998) found that diverse college campuses benefit all students. Students exposed to diversity on college campuses tend to become more culturally aware through enhanced understanding of difference and these students tend to report greater levels of satisfaction with their college experience (Astin, 2002). Students educated in diverse environments report higher levels of community service engagement (Bowen & Bok, 1998) and a greater sense of community (Milem & Hakuta, 2002). This could be due to the growth that these students report in social self-concept

(Milem & Hakuta, 2002) and feelings of greater civic responsibility (Bowen & Bok, 1998). They gain a greater awareness of the world and the world-view of others (Milem, 2003; Milem & Hakuta, 2002), which seems to motivate students to engage in efforts to enhance the communities around them. While all students report these gains, White students tend to report the greatest gains (Milem, 2003).

Smith (1989) indicated diverse faculty members more often incorporate diversity into their research and teaching. Astin's (2002) study found the role faculty play in emphasizing diversity seemed to have a greater effect on student satisfaction outcomes than institutional commitment to diversity. These findings emphasize the critical role faculty diversity plays in student development outcomes.

While all students benefit from the enhancements that diversity provides, faculty of color have a special impact on students of color on college campuses. They can serve as a role model to minority students (Astin, 1982) and reinforce to students the idea that they too can experience success academically (Smith, 1989). Often faculty of color serve as advocates for students of color (Astin, 1982) to address campus policies and practices that may be detrimental to students' growth and development (Smith, 1989).

Marx and Goff (2005), in a study assessing stereotype threat, found that Black students performed more poorly on verbal ability tests when those tests were proctored by a White experimenter and performed better on the same assessment when the test was proctored by a Black experimenter. White students' performance was unaffected by race. This finding suggests that more diverse faculty on college campuses could minimize the stereotype threat that students of color face which could result in enhanced performance. Similarly, Smith (1989) indicated that increased faculty diversity could enhance the satisfaction of students of color through creating a more welcoming environment.

Finally, increased faculty diversity is a benefit to current diverse faculty and the institutions they serve. Given higher education's commitment to a pluralistic society, faculty representation that is diverse shows a level of success in achieving equity for all members of our society (Smith, 1989). It serves as a visible indicator of an institution's commitment to equity and access (Astin, 1982) and shows that the institution has been successful in meeting its mission

and displaying the values it claims as important (Smith, 1989). Antonio (2002) found that faculty of color working in more diverse environments experienced greater job satisfaction. Often on predominantly White campuses, minority faculty members have an additional burden of advising/mentoring students of color (Smith, 1989). Increased diversity could minimize the burden, as more individuals would be available to serve in these roles.

Role of Affirmative Action

As a result of receiving contracts from the federal government, a majority of public research universities must comply with federal laws requiring affirmative action in employment (U.S. Department of Labor, 2002). Additionally, any educational institution with more than fifteen employees must comply with federal laws that prohibit discrimination based on race as well as several other categories (U.S. Equal Employment Opportunity Commission, 1997). Affirmative action laws require proactive steps to enhance the recruitment, hiring, and advancement of women, people of color, veterans and persons with disabilities.

Although many higher education institutions have been subject to these laws for almost forty years, progress in the realm of faculty diversity has experienced only minimal success (Turner, 2002). Some indicate that faculty diversification efforts have more often resulted in hiring individuals of Asian descent (Trower & Chait, 2002). Additionally, some organizations have attacked many affirmative action efforts within institutions of higher education as being illegal (Clegg, 2006). These attacks have had a chilling effect on affirmative action and diversity efforts within academia.

Higher education is in a period of transition. Many of the baby boomer population are moving toward retirement which means that universities are positioned to fill a significant number of vacancies (Trower & Chait, 2002; Turner, 2002). The growing diversity within other segments of our society challenges universities to make gains within the realm of faculty diversity (Turner, 2002). With these impending and continuing changes, it is extremely critical to identify the factors contributing to the slow progress in faculty diversification activities (Trower & Chait).

Current Status

To have a fuller understanding of the issue, it seems important to identify the current status of minorities within institutions of higher education. Astin (1982) identified several transition points through the educational system where individuals can fall out of the pipeline. This section will explore the United States population as a whole and the experiences of minorities in particular at key transition points that lead to potential opportunities to be considered for a tenure-track faculty position.

Demographics and the Pipeline

U.S. Census (2006) demographic information indicates that approximately 66.29% of the American population self-identifies as White and not Hispanic in ethnicity. A racial or ethnic minority according to Census definitions includes individuals who self-identify as Asian, Black, Native American, Native Hawaiian/Pacific Islander, and Hispanic. The representation of minorities within the U.S. population is approximately 32%. The data represented in Fig. 2.1 indicate that 12.80% of the United States population self-identify as Black.

Figure 2.1: U.S. Population Demographics
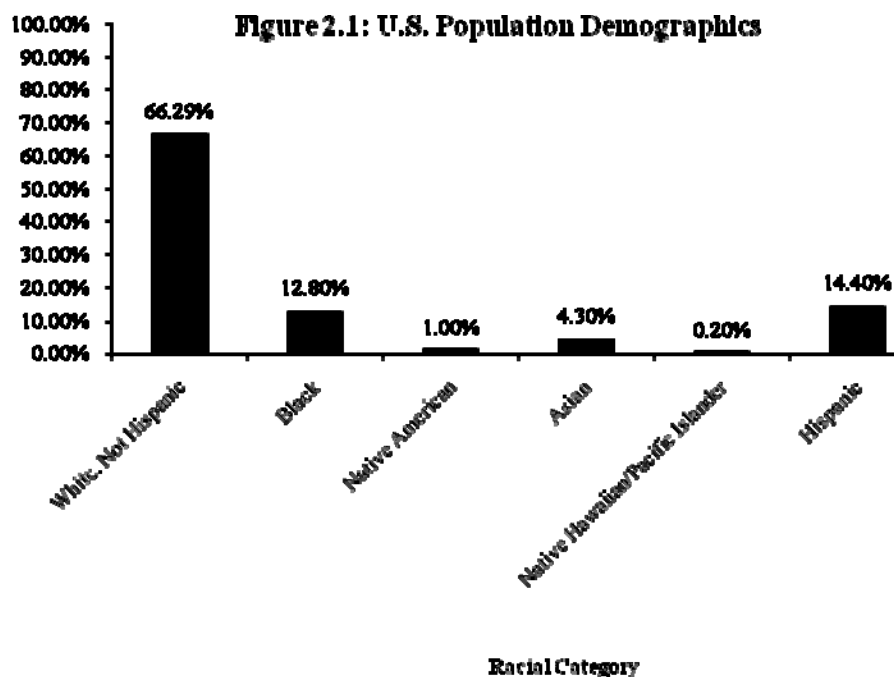
Note: U.S. Census 2006

Percentages do not equal 100% as individuals reporting two or more races were not included

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During the time period of 1991-2001, Asian/Pacific Islander, Black, Hispanic, and Native American minorities experienced growth in their representation in undergraduate college enrollment as well as graduate school enrollment. In comparison, White students experienced a decline during the same period (Harvey & Anderson, 2005). Table 2.1 shows the percentage of change for each of these populations.

Table 2.1

Percentage Increase of White and Minority Populations in Higher Education 1991-2001

	Percent Change in Student Population	
Race/Ethnicity	Undergraduate	Graduate
White, Not Hispanic	-4.9	-2.0
Asian/Pacific Islander	51.3	65.2
Black	33.2	89.2
Hispanic	74.2	96.9
Native American	33.0	67.1

Note. Harvey & Anderson, 2005

[a]Foreign students are not included

Although there have been significant gains in all facets of higher education, Altbach, Lomotey, and Rivers (2002) indicate Black, Hispanic, and Native American minorities have lower college completion rates and go on to graduate studies at rates far lower than their White counterparts. These students are less likely to attend research universities and are more likely to attend minority-serving institutions.

In their annual report detailing minorities in higher education, Harvey and Anderson (2005) showed the representation of minorities in varying stages of the higher education pipeline. One might assume a representation of underrepresented minorities in academia that is equal to the general population demographics. Unfortunately, when one examines the representation of minorities in higher education there is a somewhat different and conflicting picture.

Although Whites represent 66.29% of the population (U.S. Census, 2006), they represent 71.50% of the individuals who receive baccalaureate degrees and 86% of the tenured faculty. Blacks represent 12.80% of the population (U.S. Census) but only represent 8.60% of the individuals who obtain baccalaureate degrees and 4.40% of the tenured faculty (Harvey & Anderson, 2005). Similar patterns can be seen in Hispanic and Native American populations (See Table 2.2).

Table 2.2

Population Demographics 2000-2001

Race/Ethnicity	Population Percentages			
	U.S.[a]	BA/BS[b]	Ph.D.[b]	Tenured Faculty[b]
White, Not Hispanic	66.29%	71.50%	57.70%	86.00%
Asian/Pacific Islander	4.50%	6.10%	5.40%	5.70%
Black	12.80%	8.60%	4.80%	4.40%
Hispanic	14.40%	6.00%	3.20%	2.70%
Native American	1.00%	0.70%	0.40%	0.40%

Note. Higher education data do not include foreign students or foreign faculty.

[a]U.S. Census, 2006

[b]Harvey & Anderson, 2005

These statistics highlight the educational pipeline for tenure-track faculty positions. The pipeline to the doctorate and a tenure-track faculty position has leaks for some minority groups. The data also highlight the concept of underrepresented minorities. Black, Hispanic, and Native Americans are the individuals commonly referred to as underrepresented in terms of their expected representation in higher education. The data show that Black, Hispanic, and Native Americans are not represented at key points in the pipeline as would be expected given the population demographics in the United States.

In spite of what sometimes appears to be a bleak prognosis, there has been some progress that is worthy of discussion. At the doctoral level, there has been significant growth in the number of minorities obtaining doctoral degrees. The most significant areas of growth in the ten year time period of 1991-2001 were in the biological sciences and humanities (Harvey & Anderson, 2005). While the majority of African-American doctoral recipients are clustered in the education and social science fields (Altbach et al., 2002; Harvey & Anderson), Table 2.3 shows that the number of science and engineering doctorates awarded to African-Americans from 1990-2000 nearly doubled (National Science Foundation, 2002; 2003).

The National Science Foundation (2002) indicates that in 2000 approximately 19% of the doctoral degrees awarded in science and engineering went to minorities with 10.2% of those minorities self-identifying as Asian. This means that the percent of underrepresented minorities who obtained science and engineering doctoral degrees was approximately 8.8% (See Table 2.3).

Table 2.3

Doctoral Degrees Awarded in the Sciences and Engineering 1990-2000

	1990		2000	
	Number	Percent	Number	Percent
Race/Ethnicity				
American Indian/Alaska Native	43	0.3	88	0.05
Black, Not Hispanic	374	2.4	728	4.1
Hispanic/Latino	468	3	704	4.1
Asian/Pacific Islander	1009	6.6	1736	10.2
White, Not Hispanic	13170	85.7	13415	78.6
Other/Unknown	300	2.1	393	2.3
Total	15364	100	17064	100

Note: National Science Foundation, 2002

Looking more closely at engineering during the same time period, one finds that approximately 8% of the doctoral degrees awarded went to minorities and half of those individuals self-identified as Asian (Harvey & Anderson, 2005). This suggests that the other half (4%) of the doctoral degrees in engineering were awarded to underrepresented minorities. From 1991-2001, the percentage of African-Americans obtaining engineering doctoral degrees increased 159% (Harvey & Anderson).

Certain disciplines in engineering have higher minority representation than engineering as a whole. During the time period of 1996-2003, the average percentage of Black doctorates in

the discipline of industrial engineering was 5.6% compared to 2.75% for engineering as a whole (National Science Foundation, 2006). Within industrial engineering the highest yearly percentages for the production of Black doctorates were 8% in 1999 and 7% in 1997, 2000, and 2002 (National Science Foundation). According to J. Burrelli (personal conversation, November 14, 2006), small numbers prevent the comparison of doctoral recipients in specific sub-disciplines, such as industrial engineering, in a field to their representation in tenure-track faculty positions in industrial engineering. This limits the ability to compare minority industrial engineering doctorates to minority industrial engineering tenure-track faculty without compromising the privacy of those faculty members. This researcher has attempted to provide data regarding representation of engineering tenure-track faculty as a whole to compensate for this limitation.

Is it More Than the Pipeline?

Often the pipeline of minorities in higher education is cited as a contributor to the slow growth of minority faculty (Knowles & Harleston, 1997; Smith, 2000; Trower & Chait, 2002). It is important to acknowledge the role that the pipeline plays in the representation of tenure-track faculty but the pipeline does not seem to represent the entire issue. As previous data have highlighted, the pipeline plays some role but many universities cite the perceived pipeline problem as the sole source of their discouraging numbers of minority tenure-track faculty. Even disciplines with high representation of minorities obtaining doctorates identify the pipeline as the primary reason their faculty diversity efforts have been unsuccessful (Knowles & Harleston, 1997).

In a series of in-depth interviews, Knowles and Harleston (1997) talked to majority administrators and minority faculty regarding the challenges with diversifying the faculty. While administrators focused solely on the pool or the pipeline problem, minority faculty identified other issues such as practices utilized by universities that unconsciously removed minorities from consideration. This suggests that some level of disconnect exists between those who would be hired and the institutions that hire them.

Turner (2002), while acknowledging the pipeline problem for tenure track faculty hires, suggested that there is also a problem in utilization of the existing PhD recipients. While the

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percentage of minority faculty on university campuses has increased, the most significant areas of growth have been in non-tenure track faculty positions (Harvey & Anderson, 2005). Trower and Chait (2002) also highlighted the lack of representation of minority faculty at elite research universities. It seems minorities have been able to gain access to some types of employment within higher education but a barrier exists within the higher and more prestigious categories of employment.

Smith, Wolf and Busenburg's (1996) study of minority doctoral recipients from highly elite institutions highlighted the employment experiences of these individuals. These authors challenged the myths surrounding candidates of color for faculty positions. Although many perceived that these elite candidates were highly sought by academia, the participants revealed minimal attempts by universities to recruit them.

Another myth was the belief doctorates of color may be more interested in positions in business and industry due to those positions being more lucrative (Smith et al., 1996). The Journal of Blacks in Higher Education (2006) indicated that almost equal percentages of Black and White doctoral recipients anticipated going into academia. In fact, higher percentages of White students anticipated careers in business and industry compared to Black students. Smith et al. indicated that individuals of color who left academia for business and industry reported problems with institutional climate that prompted them to leave rather than the possibility of more money.

In 2001, Black doctorates in engineering accounted for 3.7% of all doctorates but were 2% of faculty in tenure track positions (National Science Foundation, 2004). During the same time frame, White doctorates in engineering accounted for 71% of all doctorates but accounted for 76% of all engineering faculty in tenure track faculty positions. These data suggest a problem exists. It may be possible that White individuals are hired above availability while Black individuals are hired below availability.

In spite of the pipeline challenges, candidates of color are obtaining doctoral degrees with many envisioning themselves as future academics. Somewhere along the way, something occurs to alter their path to tenure-track faculty positions. This has resulted in minorities in higher education who are not fully represented at the levels and positions expected, given their

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availability, within academe. Of course, higher education is not the only environment that has diversity related challenges.

Diversity and the Broader Society

The U.S. Department of Labor (1997), in a series of evaluations of affirmative action's progress found that while minorities were generally well represented in corporate America, this representation dwindled tremendously at senior management levels. Some evidence of progress could be seen in the representation of Black MBAs in the public sector, where many employers are subject to equal opportunity laws and affirmative action programs. This can be compared to the relative lack of progress in the private sector, where affirmative action programs are not required of employers (Thomas & Alderfer, 1989). These data suggest that affirmative action efforts have opened doors, but only partially.

The partial and limited access to employment is manifested in Fortune 1000 companies that are 97% white and 95-97% male (U.S. Department of Labor, 1997), consistently higher unemployment rates for Blacks as compared to Whites (Bielby, 2000), and the low representation of Blacks in officer positions despite their high representation in the military (Dovidio & Gaertner, 1996). Employment patterns such as these were evidenced at a time in the 1990s in which individuals from majority populations reported reduced feelings of racism and prejudice against members of minority groups as compared to feelings reported in the late 1980s (Dovidio & Gaertner, 2000).

Individuals self-report decreased levels of racism yet diversity efforts have experienced challenges throughout all employment sectors. It seems important to explore potential underlying explanations for these differences.

Stereotypes and Bias

Both legal and societal norms have resulted in the minimization of overt displays of discrimination in the United States. In current society, more subtle forms of prejudice have replaced explicit displays of bias. These more subtle forms, categorized as aversive racism (Dovidio & Gaertner, 1996; 2000), implicit prejudice (Devine, 2001), modern racism (McConahay, 1983), or second-generation racism (Lindsay, 1997) allow individuals to make raced based judgments about people that can be rationalized as objective in nature rather than

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being influenced by race. The stereotype results as information is filtered and evidence processed in such a way that it justifies one's prejudice (Allport, 1954).

Devine (2001) indicates that these more subtle forms of bias may be present in individuals who are completely unaware of their existence. Bielby (2000) referred to the attributions we make regarding the categorization of traits to racial groups as over-learned. Plous (2003) indicated, "social categories are an indispensable part of human thought" (p. 7). The associations are so ingrained in ones' functioning that they are unconsciously employed in a variety of situations (Bielby, 2000). The automatic nature of stereotypes simplifies one's thinking through selectively attending to only those elements that support our over-generalized beliefs (Allport, 1954). An unfortunate result of our tendency to use categorical thinking is the distortion of perceptions (Plous, 2003). Individuals will look for information to support the distortion and filter out or explain away information that does not support the distorted perception (Skillings & Dobbins, 1991).

Dasgupta, McGhee, Greenwald, and Banaji (2000) through administration of the implicit association test found a tendency for subjects to automatically favor Whites and associate photos of White individuals with positive stimuli or with a positive context. Photos of Black individuals were more likely to be automatically associated with unpleasant stimuli. This tendency persisted when subjects were presented with familiar as well as unfamiliar stimulus photos. Students with high levels of implicit and explicit prejudice who interacted with both White and Black experimenters were judged to have more negative interactions with Black experimenters (McConnell & Leibold, 2001). The nature of holding stereotypes about a group may result in one making a stereotyped judgment of an individual representing that group (Ryan, Judd & Park, 1996) without conscious recognition that the judgment is based on stereotypes (Yzerbyt, Schadron, Leyens, & Rocher, 1994).

In addition to effects on the evaluator, negative stereotypes can also affect the performance of the individual being evaluated. This theory, known as stereotype threat, has been identified in a series of studies. This threat occurs in situations in which one fears being judged according to a negative stereotype and results in diminished performance (Steele, 1997). Women exposed to a negative stereotype are more likely to perform poorly on assessments of

mathematics (Spencer, Steele, & Quinn, 1999). Steele and Aronson (1995) found that exposure to a negative stereotype can impair the performance of African-Americans students on ability tests. Marx and Goff (2005) found that experimenter race influenced Black students' performance with these students performing more poorly when the experimenter was White and better when the experimenter was Black. When the subject is the member of a marginalized group, this suggests that the threat can be accessed and activated or minimized dependent on the race of the experimenter.

While there is an automatic element to these attitudes, it is believed that these attitudes can be managed (Devine, 2001). In a series of studies, Lowery, Hardin, and Sinclair (2001) found anti-black sentiment was more likely to be expressed in the presence of a White as opposed to Black experimenter. This suggests that in certain situations individuals may perceive the need to control expressions of racism. Multicultural education has been evidenced to decrease levels of anti-Black sentiment (Rudman, Ashmore, & Gary, 2001) and reduce racial prejudice levels (Choi-Pearson, Castillo, & Maples, 2004; Kiselica, Maben, & Locke, 1999). Even though these beliefs were managed they did not completely disappear (Lowery et al., 2001; Rudman et al., 2001).

How Race and Racism Function

In America, race categorization began during slavery as a way to justify enslaving Africans (Smedley & Smedley, 2005). Americans have been indoctrinated to believe that the principles of democracy, freedom, and equality are core values within our society (Skillings & Dobbins, 1991). Race categories were used as a way to instill a social or pecking order within society (Smedley & Smedley, 2005) with Blacks being viewed as inferior to Whites (Hacker, 1995).

Throughout American history, racial categories have been used to limit or restrict access to the goods and resources available to members of society (Smedley & Smedley, 2005). Laws such as Jim Crow legislation that supported segregation were put into place to provide opportunities to Whites while denying those same opportunities to Blacks (Schmidt, 2005). There is no biological basis for race being a distinct category (Smedley & Smedley, 2005). Race is a human creation (Hacker, 1995) with racial categories changing throughout history to support limiting access to opportunities and resources to different ethnic groups at different points in time (Schmidt, 2005). This system of limiting opportunities, which Smedley and Smedley (2005)

referred to as systemic racism, is often a significant predictor of which members of our society face barriers to equality and those who do not.

Most White individuals view racism as an individual act by a person with strong feelings of hatred (McIntosh, 2003; Schmidt, 2005) but racism takes multiple forms. Racism invades systems or institutions to influence the decisions made within those systems (Hacker, 1995; Schmidt, 2005). This systemic form of racism may operate without the awareness of those making the decisions (Schmidt, 2005).

Within the system there is an underlying belief that Blacks are incapable of meeting the standards and expectations established within the system (Hacker, 1995). The standards established within American society are based on White cultural norms that Whites believe are norms for all individuals (Schmidt, 2005). McIntosh (2003) indicated that this form of racism provides a system of privileges for Whites due to the traits and aspects of White American culture being inextricably linked to decision-making and evaluative processes.

People operating in these systems believe that difficulties faced by minorities are as a result of their deficiencies rather than attributing it to situational or environmental factors (Plous, 2003; Schmidt, 2005). Whites believe that society is just (Plous, 2003) and decisions are based on merit (Schmidt, 2005). This belief and perception regarding the capability of Blacks leads to a different category of racism that sees Blacks as an inferior species. This underlying belief supports the concept that Blacks are primitive and lack the level of intelligence needed to operate in society (Hacker, 1995).

The disconnect between the American ideals of freedom and equality and the constant reminder that Black Americans are not afforded access to these ideals results in cognitive dissonance. Individuals use defenses and unconscious strategies to overcome the impact of cognitive dissonance. The concept that merit guides decisions and access to opportunities is one such defense (Skillings & Dobbins, 1991). In sum, racism permeates all aspects of society. Those responsible for perpetuating racism are often unaware of the way in which race has influenced their decision making process.

Effects of Race on Hiring

There is a wealth of research regarding the effects of race on hiring. Race bias can result in a greater tendency to link Blacks with lower status jobs (Pager & Western, 2005; Stewart & Perlow, 2001), assume Black applicants are inferior (Neckerman & Kirschenman, 1991), and rate Black applicants lower than White applicants (Huffcutt & Roth, 1998; Ziegert & Hanges, 2005). Negative stereotypes of minorities resulted in hiring managers using recruitment strategies to avoid considering inner city Blacks (Neckerman & Kirschenman) and potential employers deeming a White applicant with a felony as more employable than a Black applicant with no criminal convictions (Pager & Western). Individuals making stereotyped assessments were more confident in their decisions (Stewart & Perlow, 2001) and were less likely to believe their decisions were based on stereotypes (Yzerbyt et al., 1994).

While a majority of studies found that bias in hiring did not favor Blacks, a study by McIntyre, Moberg, and Posner (1980) indicated that Blacks were favored at the pre-selection phase. The pre-selection phase does not guarantee employment as evidenced by Hitt, Zikmund, and Pickens (1982) who found that Black applicants identifying their race received more initial inquiries but did not receive as many offers to interview for positions. These authors (Hitt et al., 1982) suggest that identifying race may have benefits at pre-selection but lessens chances of being interviewed and hired. The implementation of equal opportunity laws may explain this difference. Employers may be aware that they need to consider Blacks but unconscious bias and more subtle forms of racism (Devine, 2001; Dovidio & Gaertner, 1996, 2000; Lindsay, 1997; McConahay, 1983) impede employment opportunities and lead individuals making the employment decisions to believe their decisions are not race based.

Bertrand and Mullainathan (2004) found that race, as perceived by applicant name, impacted the consideration of applicants. Applicants with White sounding names received fifty percent more callbacks. When the resume was of high quality, applicants in general received more callbacks, but high quality resumes with White sounding names received statistically significant more callbacks than high quality resumes with equal qualifications that had Black names. King, Madera, Hebl, Knight, and Mendoza (2006) similarly found that resumes with Black sounding names were evaluated negatively regardless of their quality. In addition, King et

al. found that Black and Hispanic applicants were judged to be more appropriate for low status positions.

Many studies have considered hiring bias in light of other contextual factors that may give license to display more prejudice. An organizational context that promotes discrimination may determine who is brought forward for interview (Brief, Buttram, Elliott, Reizenstein, & McCline, 1995; Brief, Dietz, Cohen, Pugh, & Vaslow, 2000). When authority figures suggested a business reason to discriminate, subjects were likely to bring forward candidates consistent with the bias related criteria (Brief et al., 1995; Brief et al., 2000). An important consideration was the official's authority must be perceived as legitimate (Brief et al., 2000). In higher education environments, the focus on excellence and the belief that hiring must be merit based, but the underlying stereotype that minorities do not meet the definition of merit (Moody, 2004) could be an organizational context that supports displaying a prejudice within the hiring process.

McConahay's (1983) work examined bias in hiring as it relates to levels of modern racism, a more subtle form of racism in which people perceive that decisions are not based on racist beliefs. Those individuals with higher modern racism scores were less likely to hire a Black candidate when they were aware of the applicant's minority status.

Thomas and Alderfer (1989) believe race is "a strong predictor of position in the labor market and career patterns" (p. 133). Factors such as salary, performance evaluations, and opportunities for promotion could be viewed as relevant criteria to evaluate when assessing one's position and progress in the labor market.

Blacks have been found to have lower salaries (Braddock, Crain, McPartland, & Dawkins, 1986; Brown & Ford, 1977; Coleman, 2003), and to show less progress in moving up the career ladder as compared to Whites (Brown & Ford; Greenhaus, Parasuraman, & Wormley, 1990). Performance ratings for Black employees tended to be lower (Greenhaus et al., 1990; Mobley, 1982) and in some cases these lower ratings resulted in lower assessments in regards to viability for promotion (Greenhaus et al., 1990). While Parks-Yancy (2006) found that White and Black men's salaries tended to be higher than Black women's salaries, the author also found that Black men tended to be promoted less, resulting in lower overall career outcomes for Blacks as compared to Whites.

Some individuals may argue that these lower performance ratings may truly represent the actual performance. Brugnoli, Campion, and Basen (1979) found that ratings of performance were subject to more race bias when assessments were global. Ratings were less biased when subjects were asked to rate task specific performance. The findings suggest that using objective task related criteria alleviates issues of race bias but when more subjective, global assessments are made they are not indicative of real performance. Another factor impacting ratings of performance is the standard used to assess or determine competence. Biernat and Kobrynowicz (1997) found that Blacks were expected to demonstrate higher levels of competence to be judged suitable for employment. The standard seemed to shift dependent on the race of the applicant.

There is a question as to whether one can be exclusively objective. Wade and Kinicki (1995) found that objective and subjective criteria were intertwined. One views the objective through the subjective reality constructed by the evaluator. The effect of race was so strong in Greenhaus et al. (1990) that it explained most of the variance in career outcomes, suggesting that employee race rather than an objective performance criterion was the primary influence on the ratings.

A body of literature explored same race rating bias. This literature suggested that interviewers or evaluators will show favoritism to candidates of the same race. Studies have found that minority interviewers or evaluators rate minority applicants higher (Cesare, 1996; Hamner, Kim, Baird, & Bigoness, 1974; Lin, Dobbins, & Farh, 1992). It has been suggested that higher ratings stem from minority applicants greater comfort with interviewers of the same race resulting in better performance during the interview (Lin et al., 1992). Although same race rating effect was found in Hamner et al. (1974), there was evidence of a general bias that overwhelmingly favored White applicants. When subjects were shown White and Black applicants who displayed average performance, the White applicants were rated as excellent but the Black applicant was rated as average. Additionally, there was virtually no difference in the overall ratings of high performing Black applicants versus average performing Black applicants. This suggests that the evaluation of Black applicants was tainted with bias.

Prewett-Livingston, Field, Veres, and Lewis (1996) found a similar effect but it was dependent on the composition of the interview panel. When panels were mixed there was a

tendency for raters of the same race to favor applicants of the same race. Ratings were more balanced for all applicants when panels were predominantly Black, but when panels were predominantly White, White applicants were favored (Prewett-Livingston et al., 1996). The predominantly White panel influences the non-minority panelists by overriding the tendency of same race rating bias and thus replacing it with both Black and White panelists favoring White applicants.

Mobley (1982) also had findings contrary to the concept of same race rating bias, as Black employees in this study received the lowest ratings from Black supervisors. Although the findings on same race rating bias are somewhat inconsistent, one could argue that the evidence of such an effect may even the playing field for minority applicants. The reality in many hiring situations is that the majority of the hiring panels are likely to be White, and minority membership on these panels would not be at the level at which minority applicants may benefit.

Faculty Hiring Processes

The hiring of tenure track faculty is typically managed at the departmental level (Knowles & Harleston, 1997). Those individuals involved in the process often are not knowledgeable of hiring practices or recruiting strategies (Stein, 1993). Moody (2005) indicated search committees' efforts to streamline hiring have resulted in cognitive errors that have the effect of eliminating candidates of color. Lindsay (1997) raised similar concerns regarding search processes effects on candidates of color by describing the journey as "the middle passage" that applicants of color rarely survive. Moody (2004) indicated that minority applicants in higher education come in at a disadvantage due to stereotypes and bias that position them as inferior candidates. To be successful the candidates must defy the stereotype and prove themselves as competent. White applicants come in with the assumption of competence and must prove otherwise to not be successful.

Most individuals involved in hiring processes like to perceive that decisions are based on legitimate criteria. Swoboda (1993) identified unconscious bias, which positions candidates of color as inferior, as a phenomenon that runs rampant throughout the faculty hiring process (Swoboda, 1993). These beliefs created a system of privilege that overvalued majority males and put all other individuals at an almost insurmountable disadvantage (Moody, 2004). While search

committees perceived their decisions as based on merit, they were unaware of the unconscious negative schemas shaping their decisions (Swoboda, 1993; Turner, 2002).

While many studies have explored the challenges in achieving faculty diversity, there have been very few empirical studies exploring the actual search process. Sagaria (2002), in a qualitative study of administrative and professional search processes, identified a filtering process by which hiring committees sorted through their candidate pools. The filters were used as a way to evaluate candidates. The normative filter was used to assess objective qualifications such as education and experience. The valuative filter encompassed subjective criteria such as fit, image, and style. The personal filter was used to assess personal characteristics such as personality, personal habits, character, and sexual orientation. Finally, the debasement filter utilized criteria that were potentially discriminatory and denigrated candidates. The personal and valuative filters tended to utilize criteria viewed through a cultural lens.

While most filters were used to some extent to evaluate all candidates, some filters, such as the personal and valuative filters, were applied to candidates of color and women candidates in unusually high numbers. Sometimes the personal and valuative filters were used first before the more objective filters were employed (Sagaria, 2002). Lindsay (1997) found similar criteria used with Black women candidates for administrative positions within schools or colleges of education. These candidates were eliminated for subjective reasons such as lack of fit or a personal style that was incompatible with the institution. These subjective assessments of style were similar to Sagaria's valuative filter that encompassed values and culture based standards as the primary criterion. When candidate fit was utilized as an evaluative criterion, the candidate was always female or minority (Sagaria, 2002).

Black science and engineering doctoral recipients, who are more likely to have obtained their degrees at doctoral granting institutions, are less likely than other minorities to work at research universities with very high research activity (Burrelli, 2006). It may be possible that bias in regards to quality of the doctoral granting institution contributed to the under-employment of Black doctorates at major research universities. Mickelson and Oliver (1991) indicated that academia's practice of using doctoral granting institution as an indicator of merit had a disparate effect on the hiring of Black doctorates. Although search committees may give

individuals with degrees from elite institutions higher ratings, these authors found no connection between the quality of Black doctorates and institution quality.

The number of minority applicants in the pool can also influence assessments with stereotyped assessments occurring more often when representation is small (Huffcutt & Roth, 1998). Given the limited availability of minorities for tenure-track faculty positions within some disciplines, search processes for these types of positions may evidence the same likelihood of stereotyped assessments found in the meta-analysis conducted by Huffcutt and Roth.

The body of literature regarding race bias and the search process for tenure-track faculty positions is small but there is significant research regarding gender. Trower and Chait (2002) believed many use the pipeline issue as an easy excuse to justify the low number of minorities. In fact the slow progress of women into tenure track and administrative faculty ranks despite availability of women PhDs suggests serious problems with the search process. Awareness of candidate gender seemed to influence the screening process. Valian (1998) identified gender schemas as the source of this bias. Gender schemas, similar to the effect of race schemas, color the assessments we make by adding extra value to men's qualifications and devaluing the qualifications that women bring to the table.

Steinpreis, Anders, and Ritzke (1999) found that individuals, when evaluating a curriculum vita, were less likely to recommend hiring the individual when the curriculum vita had a female name as opposed to a male name. A similar bias was also seen in letters of recommendation. Letters written for female candidates tended to generate more doubt regarding their candidacy, were shorter in length, and described women using traits that were less prized for academic faculty positions (Trix & Psenka, 2003). Wenneras and Wold (1997) found a similar effect in the review process for awarding prized postdoctoral fellowship positions. Their findings indicated that women had to be two and a half times more productive on a scholarly level to obtain the same score as a man.

Research suggests that some factors may minimize bias. The evaluator's personal knowledge of an applicant was the only equalizing factor in the Wenneras and Wold (1997) study. Given that women and people of color often have different personal networks (Lindsay, 1997; Sagaria, 2002) the likelihood of one benefiting from this factor is slim.

A study that explored the conditions that support hiring diverse faculty found that individuals of color were more likely to be hired when one of three factors were in play: 1) a diversity emphasis in the job description; 2) a diverse search committee; or 3) use of non-traditional institutional interventions such as a target of opportunity hire that allows for hiring through use of search waivers rather than through the traditional search process (Smith et al., 2004; Turner & Smith, 2002).

While Turner and Smith (2002) and Smith et al. (2004) found no evidence that minority applicants were less qualified, they found that the majority of these applicants were hired through methods other than normal search practices. This is similar to Smith (2000) who interviewed minority recipients of prized fellowships, some of whom reported unsuccessful attempts to obtain faculty positions through the traditional search process.

Taken in sum, these findings suggest that there are problems with the traditional search process. While non-traditional interventions such as the opportunity hire have produced a measure of success, these efforts have recently come under scrutiny by opponents of diversity (Clegg, 2006). Given these challenges, it is likely that institutions of higher education will need to rely more heavily on the search process to diversify their faculty. It is especially critical that research on the search process identify factors that contribute to unconscious bias.

Summary

In this chapter, the researcher described the literature that justifies the need for this study. There is little empirical research regarding race and hiring processes for faculty positions in higher education. The limited research available focuses on administrative positions utilizing qualitative methods to describe the process (Sagaria, 2002) or evaluates search outcomes that result in hiring diverse candidates (Smith et al., 2004). To this researcher's knowledge this is the first empirical study to focus on applicant race as a potential factor influencing the evaluation of a curriculum vita for a tenure-track faculty position.

Chapter Three: Methodology

Provided in this chapter is a description of the methodology utilized to conduct this study. The research design, participants, and materials are explained and discussed.

Research Design

This experiment explored the influence race, as perceived by candidate name, has on the evaluation of individuals for a tenure-track faculty position within the discipline of industrial engineering. Industrial engineering was selected because while the base rates of Black doctorates in engineering are typically low, the rates in industrial engineering show higher percentages of Black doctorates. The higher rates in this discipline make it more likely that individuals on search committees may encounter a Black applicant thus seeing the curriculum vita with a Black sounding name would not raise suspicion regarding the nature of the study. The research question was: Does applicant race influence the evaluation of candidates for tenure-track faculty positions?

Participants

Universities were randomly selected from the membership directory of the Council of Industrial Engineering Academic Department Heads. Random selection was accomplished by assigning each university on the directory list a number. Numbers were drawn to identify 36 potential institutions to participate in the study. The technique of random selection was utilized in an attempt to ensure that the range of institutions represented in the sample would approximate the range of institutions within the United States that have industrial engineering programs.

The following institutions were excluded from the sample: the researcher's home institution and the institution of the chair of the Council of Industrial Engineering Academic Department Heads at the time the study was conducted. These institutions were involved in various capacities in the design of the study. Their intimate knowledge regarding the study design had the potential of biasing responses to the survey. Additionally, non-U.S. institutions were excluded from the sample because they are not included in the Carnegie Foundation classification system.

After randomly selecting the potential institutions to participate in the study, department heads or program coordinators were sent an e-mail alerting them that their department had been

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randomly selected to participate in a study. The letter cited important changes within the academy that have occurred in recent years. They were informed that those changes were prompting this study as the researcher was exploring what factors faculty deem important when selecting a new colleague. They were asked to notify the faculty at their institution and encourage their participation in the study. Of the thirty-six institutions that were contacted, one declined participation reducing the final sample to 35 institutions.

Once institutions were identified, university websites were reviewed to develop a list of engineering faculty members in tenure-track or tenured positions at each institution. Participants from those lists were randomly assigned to evaluate the Black applicant or the White applicant. Random assignment was used to ensure the internal validity of the findings.

Given that institutional quality differs and data has suggested differences in hiring patterns dependent on institutional type (Harvey & Anderson, 2005; Trower & Chait, 2002), steps were taken to identify institutional type. The Carnegie Foundation (2006) basic classification system was utilized to categorize institutions based on their primary focus. Similar to a strategy used in Steinpreis, Anders, and Ritzke (1999) the back of the questionnaire was stamped with one of 3 stamps that had slightly different wording. The wording, while having the appearance of vaguely referring to the study, did not indicate information that might influence the way in which participants might respond.

The sample consisted of 476 tenure-track or tenured faculty members in industrial engineering departments whose institutions were randomly selected from the directory of the Council of Industrial Engineering Academic Department Heads. Five individuals did not have e-mail addresses reducing the sample to 471 faculty members. Responses were received from 124 faculty members. This represented a response rate of 26.3%.

Materials

The participants in the study were asked to review and evaluate one curriculum vita (Appendix A). A version of the vita of an actual academic engineer with a specialty in systems engineering was utilized in this study. The CV demonstrated experience teaching four classes. While the individual had one manuscript under review by the Academy of Management Science, there were no publications in engineering research journals. A full description of the accomplishments identified on the curriculum vita is detailed in Table 3.1.

Table 3.1

Education and Experience Demonstrated on CV

Criterion	Value
Degree	BS & PhD in Industrial & Systems Engineering
Courses Taught	4
Honors & Awards	4
Publications	0
Postdoctoral Experience	1 year
Manuscripts Submitted	1
Working Papers	2
Conference Presentations	6
Grants or External Funding	0
Professional Memberships	3
Internal Committees (University)	1
External Committees	1

The version was one that the individual submitted when he successfully competed for a tenure track faculty position at a research university with very high research activity. The names on the curriculum vita were changed to avoid the possibility that familiarity may bias the evaluation of candidates (Wenneras & Wold, 1997). Consistent with Steinpreis, Anders, and Ritzke (1999) the research record that included actual journal names and research topics were maintained as part of the curriculum vita to enhance the believability that the information represented in the curriculum vita would be consistent with what a potential reviewer on a search committee would see. The following steps were taken to prevent participants from connecting the target curriculum vita to the academic engineer to whom it belongs: 1) All names on the

curriculum vita were changed; 2) the name of the academic engineer was changed; and 3) the institutions where the academic engineer obtained his degrees were changed as well.

Race was manipulated through the name on the curriculum vita. Studies have manipulated race through pictures of individuals (McConahay, 1983); disclosing race in a narrative about the applicant (Brief et al., 1995, 2000; Stewart & Perlow, 2001; Ziegert & Hanges, 2005); organizational affiliation (Dovidio & Gaertner, 2000); or name (Bertrand & Mullainathan, 2004; King et al., 2006). This researcher chose not to utilize a picture or a narrative regarding the applicant as such data is not typically provided in faculty searches. To employ either of these manipulation strategies had potential to alert participants to the nature of the study and potentially bias their responses. The stereotypes and unconscious bias that may result in hiring situations are based on assumptions stemming from indirect and subtle cues (Dovidio & Gaertner, 1996; 2000). Name has the potential to stimulate a cue and activate a stereotype regarding hiring a Black candidate for a tenure-track faculty position.

Utilizing names that were associated with a particular race was a critical facet of this study. Young, Kennedy, Newhouse, Browne, and Thiessen (1993) indicated that name has the ability to provide clues regarding one's gender or race. First names can elicit or trigger biased evaluations of individuals.

King et al. (2006) selected James Sullivan as the name of their White candidate and Jamal Jenkins as the name of their Black candidate. Although the authors made the assertion that these names were stereotypical for their respective races, their study did not state what criteria were used to affirm the claim. Miller was utilized as the last name of the fictional male and female applicants in the Steinpreis, Anders, and Ritzke (1999) study. Steinpreis et al. used the research of Kasof (1993) to identify appropriate male and female names when manipulating gender in studies and attempting to control for confounding variables such as assumptions of age and race. Brian and Karen Miller were deemed to be equivalent White sounding names.

Bertrand and Mullainathan (2004) evaluated birth certificate records over a five-year time span to identify the most frequently used forenames for African-Americans and Whites. Based on their data they identified a list of common names. To control for socioeconomic status, they evaluated birth certificate records over a sixteen-year time span to determine if a link existed between socioeconomic status and certain race distinctive names. They were able to identify a

series of the most common race distinctive names selected by highly educated White and African-American mothers. Finally, they surveyed people to determine which names they perceived as White and African-American.

Based on prior research in which race was manipulated using target name, a list of potential White and Black sounding names were identified. A pilot study was conducted to identify names that were most indicative of a particular race. Forty-five subjects participated in the pilot study. The sampling method utilized in the pilot study was convenience sampling. Pilot study participants were given a list of names and were asked to indicate if they believe the person was "White", "Black", "Other" or if they "Cannot Tell." The results of the pilot study guided the selection and identification of the race distinctive names of the targets.

Two versions of the vita were used for the two conditions represented in the study: 1) a male applicant with an African-American sounding name and 2) a male applicant with a White sounding name. Gender was kept constant to minimize the potential influence of gender bias. The curriculum vitas were identical with the exception of applicant name. Consistent with the methodology in Steinpreis et al. (1999) the curriculum vita was modified to enhance the credibility of the vita and minimize variance. The modifications included: Adding additional years to the vita so that there were no identifiable gaps in productivity or employment and removal of membership in organizations that might indicate personal or demographic characteristics of the applicant.

Questionnaire

The questionnaire (Appendix B) utilized in the study was adapted from screening matrices used in searches for industrial engineers at a research institution with very high research activity. The questionnaire contained four sections. The first section asked participants to rate, using a graphic rating scale with a Likert-type rating system, the curriculum vita on the following evaluative criteria: 1) Publication record; 2) Teaching ability; 3) Methodological skills; 4) Potential to make intellectual contributions to the field; 5) Potential to develop a strong research program; 6) Value of the candidate's specialty area; 7) Recommendation to interview; 8) Recommendation to hire; 9) Competitiveness of the candidate; and 10) Acceptability of the candidate. These evaluative criteria served as the dependent variables for this study. The Likert-

type rating system ranked candidates on a continuum of one to five as follows: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 = strongly agree.

The second section of the questionnaire asked participants to list the strengths and weaknesses of the curriculum vita. These qualitative data were collected using open-ended questions.

The third section of the questionnaire included two rank ordered lists. The participants were instructed that a ranking of one meant the factor was the most important. Participants were also allowed a category of other in which they could identify a factor that they deemed important but was not reflected on the list.

The first rank order list instructed participants to identify the criteria most important to determine eligibility for a tenure-track position. The criteria listed were: publication record, ability to teach, methodological skills, ability to make intellectual contributions, ability to develop a strong research program, complementary interests with others in the department, or other factors not listed.

The second list asked participants to rank in order of importance the traits deemed most important in selecting a colleague. This list included the following traits: potential to establish an independent research program; potential to collaborate with other faculty; potential to contribute to departmental diversity; collegiality; fit; or other factors not listed. This list also instructed participants that a ranking of one indicated the item was the most important.

The final section of the questionnaire solicited demographic data from the participants. They were asked to identify their rank, number of times they served on a search committee, race/ethnicity, gender, and age.

The variables assessed on this survey are similar to the criteria utilized in the Steinpreis et al (1999) study which asked participants to rate a curriculum vita on hire eligibility, teaching, research, and service experience. Their study also asked participants to rank order what influenced them in reviewing the curriculum vita and what qualities they looked for in a colleague.

Design and Procedure

The Institutional Review Board granted approval for the pilot study and the full study (Appendix C). A between subjects design was utilized for this study. Academic department

heads were first sent an e-mail (Appendix D) indicating that their institutions were randomly selected to participate in the study. Potential participants were then sent an e-mail (Appendix E) indicating that they had been selected to participate in a study.

The e-mail indicated important changes within the academy e.g., the emergences of new specialty areas within disciplines, increased emphasis on interdisciplinary research, the growing importance of copyright patents and intellectual property, may have helped to redefine faculty roles in recent years. As a result, the study is exploring what factors faculty deem important when selecting a new colleague. Participants were informed that their institution was selected from the membership list of the Council of Industrial Engineering Academic Department Heads to participate in the study. In the e-mail they were told that they would be receiving a packet in the mail in the next few weeks and a request that they participate in the study. In addition, participants may have also received a request from their department head or program coordinator to participate in the study.

The participants were sent one of the two curriculum vitas, a letter explaining the nature of the study (Appendix F), the questionnaire, and a self-addressed stamped envelope. Using the protocol approved by the IRB, they were assured that their responses would remain anonymous. Nothing on the survey connected back to a particular participant or a particular institution.

The questionnaires were color coded so that it was easily discernable as to which curriculum vita the person evaluated. Individuals evaluating the curriculum vita of the Black applicant were sent questionnaires printed on cream paper. Individuals evaluating the curriculum vita of the White applicant were sent questionnaires printed on white paper.

Data Analysis

The main independent variable in this study was applicant race. The dependent variable was the target faculty's employability as captured by a range of variables associated with estimates of faculty performance. Descriptive statistics were computed to summarize and capture the basic evaluation of the fictitious applicant. Descriptive statistics were also computed to summarize and capture features of the participants in the study.

One-way analysis of variance (ANOVA) was conducted to determine if there was a significant difference in evaluators' response estimates of employability based on applicant race. The survey questionnaire items that assessed publications, teaching, methodological skills,

research funding potential, interview potential, hire potential, and overall applicant acceptability were analyzed separately to see if there was a main effect for applicant race. Relationships among these dependent variables were examined to determine if items were intercorrelated.

Two-way analysis of variance (ANOVA) was conducted to determine any potential differences in response based on institutional type and demographic differences represented in the sample. Data were analyzed to determine if the assessment of the curriculum vitas of Jermaine Johnson and Brett Sullivan differed based on participant's academic rank, race, gender, prior experience serving on search committees, and age. Data were also analyzed to determine if the evaluation of the curriculum vitas of Jermaine Johnson and Brett Sullivan differed based on the type of institution in which the participant worked.

Frequency distributions were analyzed to determine how closely the demographic pool of the sample modeled the demographic profile of faculty in science and engineering disciplines.

Summary

A survey questionnaire adapted from questionnaires previously used in faculty searches in engineering was utilized for this study. Participants evaluated the curriculum vita of a real academic engineer that had been adapted and modified for the purposes of this study. Survey data were analyzed using bivariate correlations, one-way analysis of variance, two-way analysis of variance, and frequency data.

Chapter 4: Results

This chapter presents the results of the statistical analysis described in chapter three. The chapter is organized in two main sections. The first section outlines the results of the pilot study to identify names to use on the curriculum vita. The second section outlines the findings of the main study. Analysis of variance was utilized to test the research question of the study. For the reader's convenience the research question is restated: Does applicant race influence the evaluation of candidates for tenure-track faculty positions?

Implications of the findings are discussed in depth in Chapter 5.

Pilot Study

The pilot study was conducted through an anonymous survey utilizing convenience sampling. No demographic data was collected on participants in this phase of the study. Table 4.1 details the frequency distribution of participants' perception of race based on name.

Table 4.1

Name Distinctiveness Survey

Frequency Distribution

	Race			
Name	White	Black	Other	Can't Tell
Brett Sullivan	39	0	0	6
Jamal Jenkins	0	39	4	2
Brad Miller	38	0	0	7
Darnell Jones	1	37	0	7
Kareem Jackson	0	37	7	1
Todd Anderson	33	0	0	12
Brian Davis	24	1	1	19
Jermaine Johnson	0	42	0	3
Greg Moore	31	1	1	12
Rasheed Smith	0	23	19	3
Tyrone Williams	1	40	0	4
Matt Fitzgerald	39	1	0	5

Frequency data were analyzed to determine which names were most often associated as either representing a Black individual or a White individual. Based on these data, Brett Sullivan was identified as the name that was most often associated as being representative of a White male and not representative of another race. Jermaine Johnson was selected as the name that was most often associated as being representative of a Black male and not representative of another race. The names Tyrone Williams and Matt Fitzgerald were also considered but frequency data revealed instances in which individuals associated these names with a specific racial category that was different than the expected race.

A chi-square analysis was conducted to determine if the differences indicated by participants when discerning race, as evidenced by name, were significantly different. As Table 4.2 indicates, the results of the chi-square analysis for the name Jermaine Johnson show the frequency of reports that the name was more often associated with a Black individual was significantly different from reports that the name was more often associated with an individual representing another race.

Similarly, the frequency of reports that the name Brett Sullivan was more often associated with a White individual was significantly different from reports that the name was associated with an individual representing another race. Based on these data, the names Jermaine Johnson and Brett Sullivan were selected as the names to utilize on the curriculum vita for the fictitious applicant in the study.

Table 4.2

Chi-Square Analysis for Pilot Study

	Name	
	Jermaine Johnson	Brett Sullivan
Chi-Square	33.800	24.200
Df	1	1
Asymp Sig	.000	.000

Main Study

Sample Demographics

Demographic data collected on the study participants revealed that participants were very skilled at reviewing curriculum vitas. Approximately 68.6% of the participants had served on a search committee three or more times. Only 8.9% had never served on a search committee. Table 4.3 details the prior search committee experience of the participants in this study.

Table 4.3

Prior Search Committee Experience

Experience	Frequency	Percent
Never	11	8.9
1-2 Times	25	20.2
3-5 Times	44	35.5
6-10 Times	29	23.4
11 or More	12	9.7

The race/ethnicity of the participant pool is detailed in Table 4.4.

Table 4.4

Race of Study Participants

Race	Frequency	Percent
African-American/Black	3	2.4
Asian or Asian-American	19	15.3
Latino	3	2.4
Native-American / Alaska Native	1	.8
White	82	66.1
Foreign National	3	2.4
Missing	13	10.5

The participant pool in this study seemed to model the demographic profile of science and engineering disciplines. As stated in Chapter 2 of this document, the representation of minority doctorates in science and engineering was approximately 19% with approximately 10.2% of those individuals self-identifying as Asian (National Science Foundation, 2002). The sample in this study had 20.9% of the participants self-identifying as minorities with 15.3% of the participants self-identifying as Asian.

Demographic data regarding tenure-track faculty in engineering suggest that Blacks account for 2% of all tenure-track engineering faculty (National Science Foundation, 2004). The sample in this study was 2.4% Black which is strikingly similar to the demographic profile of engineering tenure-track faculty.

Descriptive Data Results

As stated in Chapter 3, participants were asked to rate Brett Sullivan or Jermaine Johnson on the following dependent variables (evaluative criteria): publication record; teaching ability; methodological skills; potential to make intellectual contributions to the discipline; ability to establish a strong research program; overall value of the discipline; recommendation to interview; recommendation to hire; competitiveness; and overall acceptability. The rating scale was as follows: 1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; 5 =

strongly agree. For example, a rating of 1 would indicate that participants strongly disagreed that Brett or Jermaine had a strong publication record.

Table 4.5 shows the means and standard deviations of the ratings for Brett and Jermaine. A higher mean score indicates that participants believed Brett or Jermaine had strong skills. There was no dependent variable or evaluative criteria that elicited a mean rating of four or five for either Brett or Jermaine. The results indicate that when assessing the quality of the curriculum vita there was no evidence that participants agreed or strongly agreed that Brett or Jermaine possessed strong skills in any of the dependent variables or evaluative criteria under consideration.

Table 4.5

Means and Standard Deviations

	Brett Sullivan			Jermaine Johnson		
	N	Mean	SD	N	Mean	SD
Dependent Variable						
Publication	66	2.18	.72	58	2.12	.85
Teaching	65	3.15	1.03	58	2.7	.89
Methodological skills	64	3.28	.74	58	3.15	.74
Intellectual contributions	66	3.12	.71	58	3.17	.70
Research	66	2.77	.71	58	2.81	.63
Discipline Value	66	3.31	.89	58	3.41	.79
Interview	65	2.72	1.12	58	2.51	.99
Hire	64	2.01	.86	58	1.87	.72
Competitiveness	65	2.5	1.00	57	2.47	.94
Acceptability	65	2.6	.96	58	2.43	.86

The results of the bivariate correlation analysis show that many of the items on the survey had statistically significant positive correlations with each other. While statistically significant

intercorrelations existed between the dependent variables, most of these variables did not have statistically significant correlations with the independent variable. This may suggest that the measures may not have been appropriate measures of the construct, applicant race. Alternatively, the levels of intercorrelation may suggest that the variables were so similar that they were measuring the same thing.

One dependent variable, teaching ability, did exhibit a statistically significant negative relationship with the independent variable. Participants were evaluating the same curriculum vita with the only difference being the perception of the race, as evidenced by name. The negative relationship suggests that when teaching ability is evaluated more strongly the independent variable, applicant race, negatively influences the evaluation. Table 4.6 shows the correlation analysis for the variables under consideration in this study.

Table 4.6 CV Evaluation Variables, Correlations and Descriptive Statistics (N = 124)

	PR	TA	MS	IC	RE	VA	IN	HI	CO	AC	CV
PR	1.000										
TA	.168	1.000									
MS	.277**	.310*	1.000								
IC	.340**	.210*	.537**	1.000							
RE	.228*	.249**	.484**	.471**	1.000						
VA	.111	.299**	.290**	.413**	.416**	1.000					
IN	.303**	.358**	.526**	.496**	.489**	.503**	1.000				
HI	.450**	.307**	.441**	.376**	.403**	.389**	.672**	1.000			
CO	.322**	.228*	.482**	.322**	.401**	.271**	.598**	.587**	1.000		
AC	.428**	.375**	.502**	.445**	.472**	.395**	.752**	.693**	.731**	1.000	
CV	-.039	-.225*	-.085	.036	.028	.056	-.097	-.085	-.033	-.109	1.000

Note. *p < .05. **p < .01.

ABBREVIATIONS

PR	Publication Record
TA	Teaching Ability
MS	Methodological Skills
IC	Intellectual Contributions
RE	Research
VA	Value
IN	Interview
HI	Hire
CO	Competitiveness
AC	Acceptability
CV	Curriculum Vita

Participants were asked to rank which factors they deemed most important to determine eligibility to be considered for a tenure-track faculty position. As Table 4.7 indicates, the most important factor was publication record with 29.8% of the participants reporting this factor as the most important. Interestingly, the applicant under consideration did not have an established publication record. The applicant had one publication under review by a systems engineering journal and had two working papers. Participants believed teaching ability was the second most important with 25.8% of the participants identifying this factor as the most important.

Table 4.7

Most Important Eligibility Criteria for Tenure Track Faculty Applicants

	Value	
Category	Frequency	Percent
Publication Record	37	29.8%
Teaching Ability	32	25.8%
Intellectual Contribution	21	16.9%
Research Potential	16	12.9%
Complementary Interests	15	12.1%
Methodological Skills	7	5.6%
Other	2	1.6%

When asked to rank order the most important factors in selecting a colleague, a large percentage noted the potential to establish an independent research program as the most important. As indicated in Table 4.8 below, 49.2% of the participants identified this factor as the most important when selecting a new colleague. Fit was noted as second with 22.6% noting this as the most important factor to consider when selecting a colleague.

Table 4.8

Most Important Factors in Selecting a Colleague

	Values	
Category	Frequency	Percent
Independent Research Potential	61	49.2%
Fit	28	22.6%
Collaboration Potential	14	11.3%
Collegiality	11	8.9%
Other	3	2.4%
Potential to Contribute to Department's Diversity	2	1.6%

One-Way Analysis of Variance Results

A one-way analysis of variance was conducted to evaluate if a significant effect for race existed, by comparing the results of those who evaluated Brett and those who evaluated Jermaine, in the following areas: the candidate's publication record, teaching ability, methodological skills, potential to make intellectual contributions to the discipline, research, overall value of the candidate's field, recommendation to interview, recommendation to hire, acceptability of the candidate, and competitiveness of the candidate.

Results of the one-way analysis of variance for each factor found that there was no significant main effect for race in the difference of the evaluation of Brett Sullivan's credentials and Jermaine Johnson's credentials based on publication record, methodological skills, potential to make intellectual contributions to the discipline, research, overall value of the candidate's field, recommendation to interview, recommendation to hire, acceptability of the candidate, and competitiveness of the candidate. Table 4.9 below shows the one-way analysis of variance for each factor where there were non-significant findings.

Table 4.9

ANOVA Results for Non-Significant Factors

Criterion	df	F	*P*
Publication	(1,122)	.185	.66
Methodological Skills	(1,120)	.872	.35
Intellectual Contributions	(1,122)	.161	.68
Research	(1,122)	.094	.75
Value	(1,122)	.390	.53
Interview	(1,121)	1.143	.28
Hire	(1,120)	.880	.35
Competitiveness	(1,120)	.134	.71
Acceptability	(1,122)	1.460	.22

When participants were assessing teaching ability of Brett Sullivan and Jermaine Johnson, there was a significant difference in the evaluation of the fictitious applicant. The results of the one-way analysis of variance found a significant main effect for race when assessing teaching ability $F_{(1,120)} = 6.472$, $p < .01$ (see Table 4.10). Participants were more likely to assess Brett Sullivan as a stronger teacher than Jermaine Johnson.

Table 4.10

Analysis of Variance for Teaching Ability

	df	SS	MS	F	P
Treatment	1	6.123	6.123	6.472	.01
Error	121	114.479	.946		

Two-Way Analysis of Variance Results

A two-way analysis of variance was conducted to determine if there were any main effects for the evaluation of the curriculum vita for Brett Sullivan or Jermaine Johnson based on the type of institution in which the participant currently worked. There were no main effects for applicant race (CV) or institutional type for the dependent variables of publication, teaching, methodological skills, intellectual contributions, research, value, interview, hire, competitiveness, or acceptability. There were no interaction effects for applicant race (CV) and institutional type for the dependent variables of publication, teaching, methodological skills, intellectual contributions, research, value, interview, hire, competitiveness, or acceptability. These data indicate institutional type had no impact on the evaluation of the curriculum vita.

Next a series of two-analyses of variance were conducted to determine if the demographic characteristics of the sample had any influence on the evaluation of the curriculum vitae. The individual demographic characteristics that were assessed were: participant race, participant age, participant rank, prior search experience of participants, and participant gender.

The results of the two-way analysis of variance to assess the main effect of applicant race (CV) or participant race indicated there were no main effects on the dependent variables of publication, teaching, methodological skills, intellectual contributions, research, value, interview, hire, competitiveness, or acceptability. When interaction effects between applicant race and participant race were evaluated, the findings indicated that there was evidence of interaction effects for the dependent variables of publication ($F = 4.778$, $p < .01$) and competitiveness ($F = 3.841$, $p < .05$). The findings suggest that participant race influenced the evaluation of the curriculum vita when participants were evaluating publication and competitiveness of Brett Sullivan and Jermaine Johnson. Details of the interaction effects are displayed in Table 4.11.

Table 4.11

2 Way ANOVA Interaction Effects for Participant Race & CV Evaluation

Criterion	df	F	*P*
Publication	3	4.778	.004
Teaching	3	.637	.593
Methodological Skills	3	.417	.741
Intellectual Contributions	3	.443	.722
Research	3	.419	.740
Value	3	1.548	.207
Interview	3	.170	.917
Hire	3	.681	.566
Competitiveness	2	3.841	.025
Acceptability	3	2.112	.103

As Figure 4.1 indicates, African-American participants in the study rated Jermaine Johnson higher on publication record than Brett Sullivan. Asian and Asian American participants rated Brett as higher on publication record than Jermaine. Post hoc analyses could not be conducted due to at least one group having fewer than two cases. As such, the significance of the differences in the means could not be assessed.

4.1 Publication Evaluation by Participant Race and Applicant Race (CV)

Estimated Marginal Means of Publication
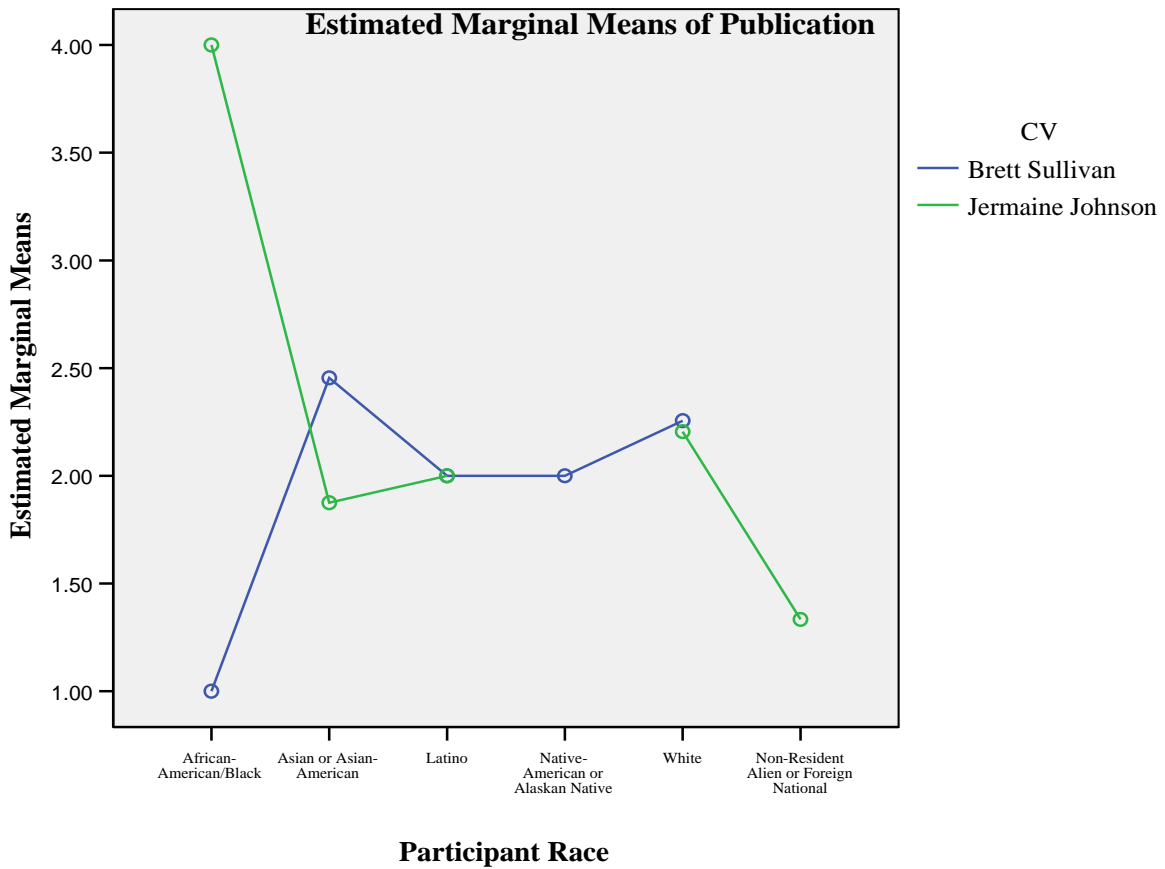
Note: Non-estimable means are not plotted

Figure 4.2 shows the differences in the evaluation of the perceived competitiveness of Brett Sullivan and Jermaine Johnson based on the race of the participant who was evaluating the curriculum vita. Asian American and Latino participants deemed Jermaine as more competitive than Brett. White participants deemed Brett as more competitive than Jermaine. The statistical significance of the differences in the means could not be assessed as at least one group had fewer than two cases.

Figure 4.2 Evaluation of Competitiveness by Participant Race and Applicant Race
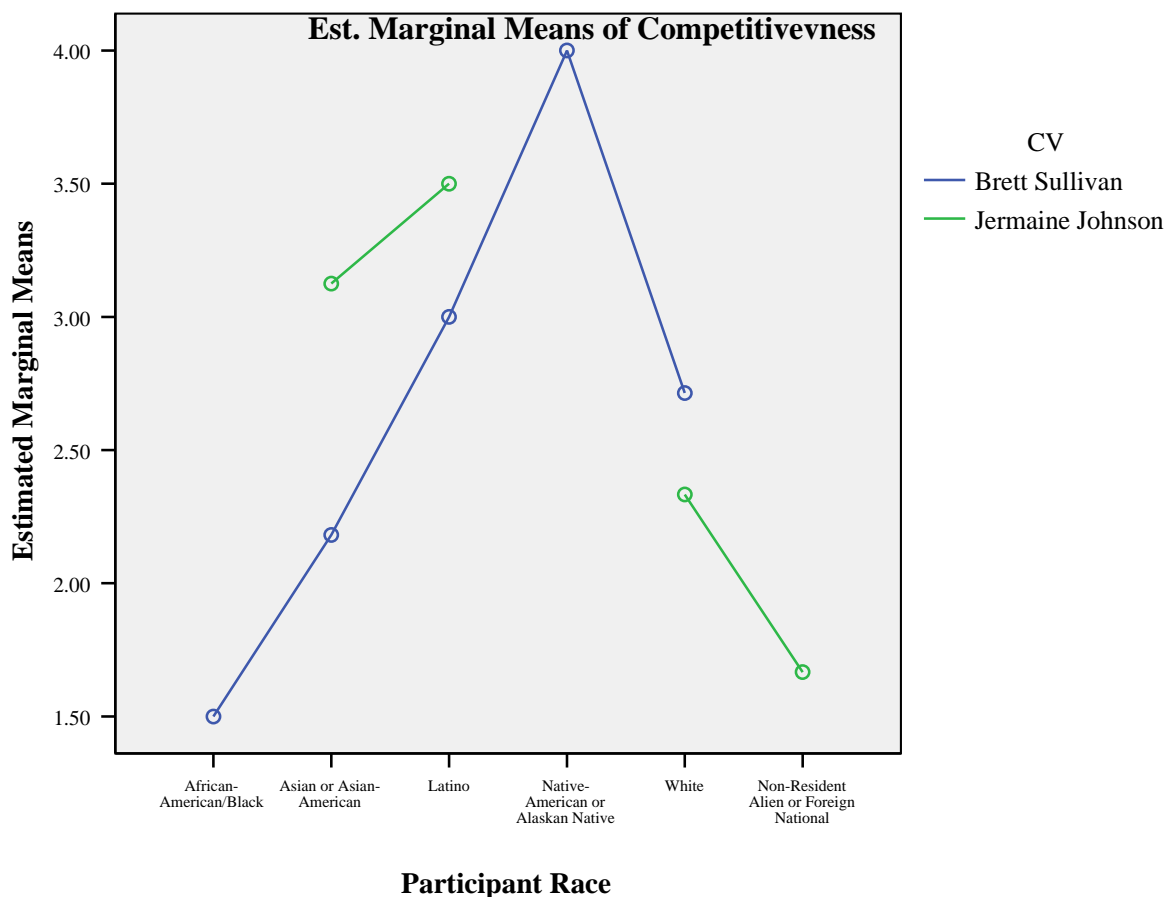
Note: Non-estimable means are not plotted

A two-way analysis was conducted to determine if there was a main effect for applicant race (CV) and age of the participants with the dependent variables. As Table 4.12 indicates, there was a main effect for applicant race (CV) and the dependent variables of teaching ($F = 6.011$, $p <$ .05). There was no main effect for age with dependent variable of teaching, nor was there an interaction effect of participant age and applicant race (CV) with the dependent variable of teaching. These findings suggest that the race of the applicant influenced the evaluation of the fictitious applicant's teaching.

Table 4.12

Two Way Analysis of Variance for Teaching

Source	df	MS	F	P
CV	1	5.289	6.011	.016
Age	5	1.430	1.626	.160
CV*Age	5	1.296	1.472	.205

For the dependent variable of value, there was a main effect for age (F = 2.320, p < .05). There was no main effect for applicant race (CV) and there were no interaction effects of applicant race (CV) and age. Findings suggest that the age of the participant influenced the assessment of the curriculum vita when participants were assessing the value of Brett or Jermaine's discipline (Table 4.13).

Table 4.13

Two Way Analysis of Variance for Value of the Discipline

Source	df	MS	F	P
CV	1	.121	.176	.676
Age	5	1.595	2.320	.048
CV*Age	5	.831	1.209	.310

There was no evidence of main effects for participant age or applicant race for any of the remaining dependent variables. Results indicated there were no interaction effects for participant age and applicant race for any of the remaining dependent variables.

There was no evidence that the academic rank of the participants influenced the evaluation of the curriculum vita. Results of the two-way analysis of variance indicated there was no main effect of participant's academic rank on the evaluation of Brett Sullivan or Jermaine Johnson's curriculum vita for any of the dependent variables in the study. There was no evidence of interaction effects between participant rank and applicant race (CV). The results of the

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analysis of prior search experience of participants indicated that there was no main effect for prior search experience on the evaluation of the curriculum vitas of Brett Sullivan or Jermaine Johnson. There was no evidence of interaction effects of prior search experience and applicant race (CV).

Finally, there was no evidence that the gender of the participant influenced the evaluation of the curriculum vita. Results indicated that there were no main effects for gender for any of the dependent variables in the study. There were no interaction effects for applicant race (CV) and gender on the evaluation of any of the dependent variables.

Summary

To summarize these findings, rankings to determine which criteria participants believed to be most important for tenure-track faculty applicants revealed that publication record and teaching were deemed the most important by 55.6% of the participants. The curriculum vita was rated weak in publication record with Brett Sullivan receiving a mean score of 2.18 and Jermaine Johnson receiving a mean score of 2.12. The curriculum vita was evaluated higher in teaching with Brett Sullivan receiving a mean score of 3.15 and Jermaine Johnson receiving a mean score of 2.70.

One-way analysis of variance revealed a statistically significant difference in the evaluation of the fictitious applicant's teaching ability with Brett Sullivan being assessed as stronger on the dependent variable, teaching ability, than Jermaine Johnson. There were no statistically significant findings with the other dependent variables (evaluative criteria) under review. When evaluating the curriculum vita, mean ratings never reached the level indicating that participants agreed or strongly agreed that either candidate, Brett or Jermaine, was strong in any of the dependent variables.

Two-way analysis of variance revealed that participant's gender, rank, institution type, or prior search experience had no influence on the evaluation of the curriculum vita of Brett or Jermaine for any of the dependent variables in the study. There was also no evidence of interaction effects with applicant race and participant gender, rank, institution type, or prior search experience with any of the dependent variables under consideration.

When considering participant race, there was an interaction effect between participant race and applicant race when assessing publication record and competitiveness. While the significance of the differences in means could not be calculated, it appeared that African-Americans rated Jermaine higher than Brett on publication record but Asians rated Brett higher than Jermaine when assessing the same dependent variable. When assessing competitiveness, Whites rated Brett as more competitive but Latinos and Asians rated Jermaine as more competitive.

The results of the two-way analysis of variance for participant race and applicant race revealed an interaction effect between participant race and applicant race (CV) when assessing the competitiveness and publication record of Brett Sullivan or Jermaine Johnson. The two-way analysis of variance for participant age and applicant race revealed a main effect for applicant race when assessing the teaching ability of Brett or Jermaine. There was a main effect for age when participants were assessing the perceived value of Brett or Jermaine's discipline. There was no evidence for main effects or interaction effects for any of the other variables under consideration in the study.

Chapter 5: Discussion

The purpose of this study was to determine the factors that influence faculty when they are reviewing curriculum vitas for a tenure-track faculty position. Of particular interest was the influence that applicant race has on the evaluation of the curriculum vita. An additional purpose of the study was to inform those responsible for hiring decisions as to the factors that may consciously and unconsciously influence those evaluative decisions.

Prior studies evaluated the impact gender had on the evaluation of candidates for faculty positions and prior studies evaluated the impact race had on different kinds of employment categories. This study contributes to the field as it is the first empirical study to consider the influence of race on the evaluation of candidates for a tenure-track faculty position. This chapter will discuss and consider the implications of the data analysis results highlighted in chapter four.

Prior research found that race was a significant factor in the evaluation of candidates, with Black job candidates receiving lower evaluations than White job candidates (Bertrand & Mullainathan, 2004; Hitt et al., 1982; Huffcutt & Roth, 1998; Pager & Western, 2005; Ziegert & Hanges, 2005). None of these studies evaluated faculty positions. The existing literature on faculty positions in which studies utilized empirical methods evaluated gender, not race. Studies on the effect of gender on faculty hiring found that women were less likely to be recommended for hire for a tenure track faculty position (Steinpres et al., 1999) and were less likely to receive prized fellowships (Wenneras & Wold, 1997). This study contributes to bias literature as it is the first empirical study, to this author's knowledge, to evaluate the effect of race on the evaluation of candidates for tenure track faculty positions.

Prior to discussing the findings, it seems important to discuss the correlation data for the dependent variables. The correlation data indicated that publication record and teaching ability were not intercorrelated suggesting that these variables were distinct from each other.

Publication record was intercorrelated with methodological skills, intellectual contributions, research potential, interview potential, hire potential, competitiveness, and acceptability. Teaching ability was also intercorrelated with methodological skills, intellectual contributions, research potential, interview potential, hire potential, competitiveness, and

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acceptability. These findings suggest that teaching ability and publication record are separate variables that individually measure perceived employability in a tenure track faculty position.

When participants evaluated the teaching ability of Brett Sullivan and Jermaine Johnson, there was a significant effect for race with Brett receiving higher ratings on teaching ability than Jermaine. The rankings of which criteria participants deemed important in determining ones' eligibility for a tenure track faculty position and the evaluations participants made regarding how strong they rated Brett and Jermaine may shed light on analysis of variance findings.

Study participants ranked publication record as the criteria which most influenced a candidate's eligibility for a tenure-track faculty position. Study participants were also asked to evaluate the factors they deem the most important when selecting a new colleague. The ability to establish an independent research program was ranked as the most important factor in selecting a new colleague. The curriculum vita utilized in the study did not have a publication record nor did the individual possess any grants. Furthermore, when subjects evaluated the curriculum vita on the strength of the publication record, mean evaluation scores for Brett and Jermaine indicated they disagreed that either candidate possessed a strong publication record. When candidate credentials are weak, it seems that applicant race does not matter. Both the Black applicant and the White applicant were evaluated low on publication record and findings suggest race did not factor into the evaluation.

The second most important factor participants believed determined ones' eligibility for a tenure track faculty position was teaching ability. When participants were evaluating the teaching ability of Brett and Jermaine, the mean evaluation scores indicated that participants believed Brett and Jermaine were stronger on teaching ability than publication record with Brett being evaluated higher than Jermaine on teaching ability. Even though the mean scores were higher for teaching ability than for publication record, the mean scores never reached a level which suggested participants agreed or strongly agreed that Brett or Jermaine credentials were strong. In this instance, when the candidates were assessed higher on an evaluative criteria race appeared to factor into the assessment of candidates with the White candidate being favored.

It is possible that when participants did not exhibit bias in the evaluation of Brett or Jermaine it was due to how participants assessed the quality of the credentials. When a candidate is clearly weak, decisions are made regardless of race.

Other studies have found that the quality of credentials influenced the evaluation of candidates. Steinpres et al. (1999) found gender bias when the qualifications of the candidate were weak but did not find gender bias when the qualifications were strong.

Dovidio and Gaertner (1996; 2000) also found influences in the evaluation of candidates based on quality of the credentials. One study found that Black applicants were evaluated more negatively when qualifications were strong (1996). Another study found that when qualifications were ambigious, White applicants were responded to as if they were strong but the Black applicants with the same level of qualifications were rated as if their credentials were weak (2000).

While mean scores for teaching ability indicated that Brett and Jermaine were stronger on teaching ability than publication record, it is possible that they were not actually stronger on teaching ability but perceived stronger due to teaching ability being an ambigious criteria. Publication record is a criteria that is easily assessed via the review of a curriculum vita. An evaluator can easily and clearly determine whether or not a candidate possesses this criteria. Teaching ability, on the other hand, is more ambigious. A candidate for a faculty position may indicate that they have taught certain courses but it may not be clear whether or not they excelled in teaching the courses. Furthermore, the names of courses often differ from institution to institution so it may not be immediately clear whether a course that an applicant taught is applicable to the institution where a position is being filled. The findings of this study suggest that teaching ability represented an ambigious situation. In this ambigious situation, Brett was assumed to be stronger in teaching ability than Jermaine. These findings seem to partially support Dovidio and Gaertner's (2000) prior research on ambigious qualifications.

Additional analyses were conducted to determine if aspects of the participant pool influenced the evaluation of the curriculum vita. Findings revealed that participant race and participant age effected the evaluation of the curriculum vita.

African-American participants rated Jermaine higher on publication record but Asian participants rated Brett higher. White participants rated Brett as more competitive, whereas Latino participants favored Jermaine in their estimation of competitiveness. The finding that African-Americans tended to rate the African-American vita higher on publication record and White participants rated the White applicant as more competitive supports previous literature on same race rating effect bias (Cesare, 1996; Hamner et al., 1974; Lin et al., 1992). Similar to Hamner et al., minority participants favoring the minority applicant did not negate the overall bias toward the White applicant when participants assessed the fictitious applicant's teaching ability. Findings indicate that participant age also impacted the way in which Brett and Jermaine were evaluated. When participants were evaluating the perceived value of the discipline of Brett or Jermaine, the age of the participant influenced the assessment .

In this study, it seems that two factors converged to trigger an evaluation based on race. The importance placed on the factor when participants were evaluating which criteria were important to determine one's eligibility for a faculty position is one factor that seems to have contributed to a race based assessment. In this study, participants reported that publication record and teaching ability were the two most important factors that determine eligibility for a tenure track position.

The second factor that seemed to trigger an assessment based on race is the ambiguity of the factor under consideration. As previously stated, publication record and teaching ability were deemed the most important criteria to determine whether or not an applicant was eligible for a faculty position. Publication record is a criteria that one can more clearly discern whether a candidate possesses the criteria. Teaching ability is more ambigious as one cannot easily discern the quality of the teaching from reviewing a curriculum vita.

Participants recognized that publication record and teaching ability were important to determine how qualified the fictitious applicant was. It was obvious that the fictitious applicant did not have an established publication record thus this criteria was not ambigious. While both Brett and Jermaine had taught courses, it was not clear whether or not they excelled in teaching those courses. Some courses on the curriculum vita appeared to be co-taught. As such, it would not be immediately clear the extent of Brett or Jermaine's individual contribution toward

teaching those courses. In a situation where the qualifications are not clear or distinct, participants may have opted to assume that Brett was stronger.

Approximately 55.6% of the participants in this study deemed publication record or teaching ability as the most important factors when determining eligibility for a tenure track position. It was clear that the curriculum vita was evaluated as weak on publication record and in that circumstance an evaluation based on race did not occur. Teaching ability was more ambigious and while the vita was evaluated slightly higher on teaching ability for both Brett and Jermaine the mean scores for teaching ability did not indicate that participants believed that either candidate's was exceptionally strong. This suggests that the qualifications were more ambigious and that ambiguity resulted in an assessment based on race.

Limitations and Recommendations for Future Research

The study had limitations that may have impacted the final results. One such limitation pertains to the credentials displayed on the curriculum vita. Publication record emerged as the most important factor for participants when determining eligibility for a tenure track postion but the curriculum vita used in the study did not have an established publication record. While there were some findings of statistical significance, the results were inconsistent. This may be due to the quality of the credentials represented on the target curriculum vita utilized in this study.

Future research should include steps to evaluate the curriculum vita to assess the perceived quality. It would be prudent to have a subject matter expert evaluate the curriculum vita to ensure that the credentials represented are consistent with the credentials of recently hired tenure track faculty in their department. Although the curriculum vita was that of an individual who had been successfully hired into a tenure track position, that hire took place several years prior to the commencement of this research study. The findings of this study suggest that expectations have changed in terms of credentials needed to obtain a tenure-track faculty position. This researcher was unable to find any current research that identifies the skill set needed to become an academic engineer but Ng (1997) indicated that the number of research grants and book chapters were significant predictors of hire into faculty positions in psychology.

Future research should include in the same study the evaluation of credentials that represent strong and weak qualifications. In this researcher's study, it appeared that ambiguous qualifications provided the condition for bias to influence the evaluation of the fictitious

applicant. Prior research has included high quality and low quality resumes (Bertrand & Mullainathan, 2004; Dovidio & Gaertner, 1996; 2000) to determine the extent to which quality influences evaluation of candidates. Findings of the aforementioned studies have been inconsistent. It may be that quality trumps race but the inconsistency of findings suggests that further review is warranted.

While it seems that publication record and teaching ability are important factors in determining one's eligibility for a faculty position, the data collected in this study were ordinal data. As such these findings can describe what seems to be the most important criteria to determine eligibility for a tenure track faculty position but the findings cannot infer which skills or characteristics are predictive of one's successful hire into a tenure track faculty position in engineering. Future studies should explore recent hires into academic engineering departments over a period of years to discern which factors significantly predict hire. Race/ethnicity should be one of the factors included in the review. Multiple regression could be used to analyze the recent hires to determine if a model can be developed of which skills and attributes predict hire into a tenure track engineering faculty position.

Another limitation of the study is the moderate to high levels of intercorrelation exhibited in the dependent variables. An array of several factors were identified to assess the perceived employability of the fictitious applicant. It was expected that each variable would be an independent criterion but many of the variables displayed significant correlations at the .05 or .01 level. Given the areas of non-significant findings that emerged in the study, it seems possible that the variables were measuring the same thing. Future studies should include efforts to pilot the survey instrument so that levels of intercorrelation can be determined prior to implementation of the main study. These studies should incorporate an item analysis of the survey that would allow individuals, who would be similar to the proposed sample, to evaluate the vita using the proposed survey. Item analysis should be conducted and reliability statistics analyzed to ensure that there is confidence in the scores generated from the questionnaire.

In this researcher's study, applicant race was not explicitly mentioned but rather inferred by target name. While applicant race produced a statistically significant finding for one of the dependent variables, the other dependent variables did not have significant findings. It is possible that the name selected did not consistently produce a strong enough prime to activate evaluations

based on race. The method utilized to identify names to place on the curriculum vitas may have resulted in the selection of names that were not most often associated with a particular race.

Anderson-Clark, Green, and Henley (2008) utilized a survey produced by the Social Security Administration to identify the most popular name given to babies each year as a starting point to select names that may be indicative of a particular race. Similarly, Bertrand and Mullainathan (2004) reviewed birth certificate records from 1974 and 1979 to identify names. It is suggested that future research utilize similar methods to identify potential names. Use of similar practices would result in a recent listing of names that are currently associated with certain races and ethnicities. These names may be more likely to prime a race based stereotype due to the recency of such names being associated with a particular race.

The sampling technique for the pilot study to select the names was convenience sampling with a relatively small number of subjects (n = 45). It is suggested that future research utilize a broader sampling technique with a larger sample size to identify names that are associated with a particular race. Broader techniques and a larger sample size have a greater likelihood of assuring the association of a name to a particular race is not due to chance.

Although the strategy for identifying potential names that signify race could be improved, the findings of this study suggest that applicant race can impact the evaluation of candidates for tenure-track faculty positions when the criteria under consideration is valued and the candidate qualifications are ambiguous.

Recommendations for Practice

This researcher's study found that applicant race influences the evaluation faculty make of potential job candidates. While the subject population for this researcher's study was industrial engineering faculty, the findings have implications for counselor education.

Within the counseling field, there has been a great focus on the need for counselors to increase their efficacy in counseling culturally diverse clients. Multicultural counseling competencies were developed to provide guidance on the critical skills counselors must possess.

Multicultural counseling competencies focus on three areas: 1) counselor awareness of one's own cultural values and biases; 2) counselor awareness of the client's cultural values, attitudes, and beliefs; and 3) implementing culturally relevant and appropriate counseling intervention strategies (Arredondo et al, 1996). Research has suggested that White counselors

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self-report unease in their competencies in addressing multicultural issues (Pope-Davis & Ottavi, 1994). This unease can impact counselor's ability to confidently broach the issue of race when it is a part of the client's presenting problem. Day-Vines et al (2007) indicated that the ability to acknowledge and broach race is a critical component to developing an effective therapeutic alliance. Faculty can play critical roles facilitating student competencies in this domain. Miller, Miller, and Stull (2007) found that faculty perceptions and biases shape student perceptions of diversity. It is critical for faculty to be aware of their biases and how they may influence students.

The findings of this researcher's study suggest that faculty exhibit bias based on race. These biases have the potential to influence student perceptions. With the consistent focus on multicultural competencies in counseling programs, it would be interesting to replicate this study using counseling faculty as the subject pool. It may be possible that the focus on multicultural counseling competencies within the field has resulted in an effective prejudice reduction strategy as described in the research of Utsey, Ponterotto, and Porter (2008). Their findings suggested that effective programs have been successful in increasing counselor educators' levels of awareness of their own personal biases and improving the ability to effectively manage those biases when working with diverse groups.

In addition to applicant race influencing the evaluation of credentials, findings indicated that the race of the evaluator influenced the assessment of candidate credentials. This study focused exclusively on the evaluation of job applicants but there are many situations in which faculty may evaluate potential students and current academic program participants. As such, it is important that evaluation activities include safeguards to ensure that bias is not influencing an assessment. Within this study, the ambiguity of teaching ability set the condition for a race based assessment. When evaluation committees are assessing criteria that seem ambiguous and subjective, it would be important to identify a more objective way to assess the criterion under review. For example, requiring teaching evaluations or including a teaching demonstration as part of the search process could be ways to decrease ambiguity. It also seems important to have a diverse screening committee to minimize the potential impact of same-race rating effect.

University administration can play a critical role in setting a tone that shows that diversity is valued. Miller et al. (2007) found that faculty members' perceptions of the level of support for diversity at their institutions influenced their attitudes and behaviors. Possibly, institutions that strongly advocate for inclusive hiring practices could shape an environment for faculty that result in minimizing bias in the selection process. In addition, it is important for faculty on search committees to reevaluate their screening practices to ensure that they are not unconsciously screening out candidates based on factors such as race.

For counselor education students who will be seeking faculty positions, this study provides insight into what faculty deem important when they are selecting a new colleague. The study also highlights that there may be other subtle factors that influence how one's curriculum vita is evaluated. Trends in naming African-American children have moved toward selection of more unique names, such as Shaquanda or Raheem that recognize their African or African-American culture (Daniel and Daniel, 1998). For individuals with very unique names, it is possible that assumptions may be made regarding the veracity of one's credentials based upon the name listed on a curriculum vita.

Although additional research is needed to address the limitations of this study, findings suggest that applicant race influences the evaluation of curriculum vitas for faculty positions when a criterion is deemed important by the evaluator and qualifications are ambiguous.

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EDUCATION

Virginia Tech

Ph.D. in Industrial & Systems Engineering   May 2007

Dissertation: "Three essays on modeling dynamic organizational processes"

Virginia Tech

B.S. Industrial & Systems Engineering   May 2002

Graduated Magna Cum Laude

AWARDS

IATC "Bridges of Hope" award and scholarship   2007

Dana Meadows Award for best student paper in International System Dynamics conference

2006

Wilson Fund Fellowship   2002-2007

Dana Meadows Award for best student paper in International Systems Dynamics conference

2003

Presidential Graduate Fellowship   2002-2003

Best paper award – National Industrial Engineering Conference   2001

TEACHING EXPERIENCE

Teaching Assistant – **"Management of Change, Innovation, and Performance in**

Organizational Systems I & II"   2005-2006

Collaborated on curriculum development. Supervised 7 consulting projects applying system

dynamics tools Ran weekly breakout sessions with close interaction with students, TA

evaluation, three TAs aggregated: 4.78/5 (2004), 4.58/5 (2003), Department TA evaluation average 3.9

Teaching Assistant – **"Information Systems Analysis"**   2003
Held recitation sessions. Collaborated on grading of assignments, met with students upon request. TA evaluation, four TAs aggregated: 3.65/5

Instructor – **"ISE Seminar"**   2003
Developed syllabus and overall course structure, lectured on principles of system dynamics, invited guest speakers on to discuss research topics, helped computer lab training session.

RESEARCH AND RELATED EXPERIENCE

Virginia Tech

Postdoctoral Associate   August 2007 - Present
Conducted comparison of product development formulations. Prepared research papers for presentation at national conferences and for publication, with an emphasis on refereed journals

Research Assistant   2003-2007
Gathered field data, built simulation models, analyzed models, wrote reports in three different research initiatives: dynamics of multiple-release product development, agent-based vs. differential equation simulation models and effects of time delays and learning

Virginia Tech

Graduate Research Symposium   2002-2006
Part of a committee that organized the annual Graduate Research Symposium. Presented research at the symposium

International System Dynamics Conference

Reviewer   2003-2004
Reviewed professional articles for acceptance in conference

International System Dynamics Conference

Workshop Coordinator   2003, 2005

Planned, invited, and coordinated over 30 workshops for two conferences

PUBLICATIONS AND PAPERS

Johnson, J. 2006. Dynamics of multiple-release product development. Working paper.
Studies capabilities erosion in multiple-release product development. Introduces adaptation trap
where intendedly functional adaptation can lead to firefighting in product development. Earlier
versions presented in Center for Innovation in Product Development seminar and International
Association for Product Development Conference, Fall 2006, and International System
Dynamics Conference, 2007

Johnson, J. & Smith, R. 2006. Hetergeneity and Network Structure in Dynamics of Contagion:
Comparing Agent-based and Differential Equation Models. Under review in Management
Science.
Compares agent based and differential equation modeling paradigms in the context of epidemic
modeling by investigating the importance of network structure and agent heterogeneity. Earlier
versions presented at the NAACSOS Conference, 2006, 22nd International Systems Dynamics
Conference (ISDC), 2006, and AOM 2007. It won the best student award for ISDC in 2006

Johnson, J, Johnson, D. & Smith, R. 2006. Effects of Feedback Delays on Learning, Working
paper.
Investigates the effects of time delays between action and payoff on learning, through
comparative analysis of four simulation models of learning. Earlier versions presented in
Academy of Management Conference, 2005, NAACSOS Conference 2005, and International
Conference of the System Dynamics Society, 2004

Johnson, J. & Davis, M. 2003. Tightening the Iron Cage or Path Dependence in Norm Formation? A System Dynamics Approach. The 19th International Conference of the System Dynamics Society. (Won best student paper award)·

Johnson, J. 2002. Developing a Model for Paradigm Shift in Service Industry. 18th International Conference of the System Dynamics Society.·

Johnson, J. & Wilson, R. 2002. A System Dynamics Approach to Organization Design: Case of Talented Students' Center at U.S. University. 18th International Conference of the System Dynamics Society.

MEMBERSHIPS IN PROFESSIONAL ASSOCIATIONS

Academy of Management

INFORMS

System Dynamics Society

Appendix B: Questionnaire

	Strongly Disagree 1	Disagree 2	Neither Agree or Disagree 3	Agree 4	Strongly Agree 5
1. This candidate has a strong publication record					
2. This candidate will be able to teach a variety of courses in the discipline.					
3. This candidate has strong methodological skills in his/her area of expertise.					
4. This candidate will make significant intellectual contributions to the discipline					
5. The candidate will develop a strong funded research program.					
6. This candidate's specialty area is one that could be valued					
7. I would recommend interviewing this candidate					
8. Based on the limited information provided, I would recommend hiring this candidate					
9. How competitive would this individual be in a tenure-track faculty search at your institution					
10. Overall, my rating of acceptability of this candidate is:					

11. What are the **strengths** of the candidate, based upon your review of the CV?

12. What are the **weaknesses** of the candidate, based upon your review of the CV? What recommendations would you give to this candidate to enhance his candidacy for a tenure track faculty position?

Please rank order the following 6 factors in order of importance in determining candidates' eligibility for a faculty position with 1 being the most important

____	Publication record
____	Ability to teach in the discipline
____	Methodological skills
____	Ability to make significant intellectual contributions to the discipline
____	Ability to develop a strong funded research program
____	Applicant interests were complementary to your department
____	Other factors, list: _____

Please rank order the following 5 traits in order of importance in selecting a colleague with 1 being the most important

____	Potential to establish an independent research program
____	Potential to collaborate with you or other faculty on research or teaching
____	Individual's potential to contribute to departmental diversity
____	Collegiality
____	Fit within the department
____	Other traits, list: _____

Demographic information

What is your rank?

____	Instructor
____	Assistant Professor
____	Associate Professor
____	Full Professor
____	Department Head
____	Other: _____

How many times have you served on academic search committees?

____	Never
____	1-2 times
____	3-5 times
____	6-10 times
____	11 or more times

Race/Ethnicity

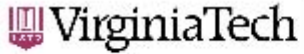|	
____	African-American/Black
____	Asian or Asian-American
____	Hispanic/Latino
____	Native-American or Alaskan Native
____	White
____	Non-Resident Alien or Foreign National

Sex

____ Male

____ Female

Age

____ 20-30

____ 30-40

____ 41-50

____ 51-60

____ 61-70

____ 70+

Appendix C: IRB Approval

VirginiaTech

DATE: September 8, 2008

MEMORANDUM

TO: Kelly Oaks
           Nancy E. Bodenhorn
           Mido Chang

FROM: Carmen Green

SUBJECT: **IRB Amendment 2 Approval:** "Factors Influencing CV Review of Applicants for Faculty Positions", IRB # 07-467

This memo is regarding the above referenced protocol which was previously granted approval by the IRB on September 28, 2007. You subsequently requested permission to amend your IRB application. Approval has been granted for the requested protocol amendment, effective as of September 8, 2008.

As an investigator of human subjects, your responsibilities include the following:

1.   Report promptly proposed changes in the research proposal. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2.   Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File

Invent the Future

Appendix D: E-Mail to Department Heads

Dear _____:

Your institution's department was randomly selected from the membership list of the Council of Industrial Engineering Academic Department Heads to participate in this research study. The emergence of new specialties within disciplines, increased emphasis on interdisciplinary research, the growing importance of copyright patents and intellectual property issues may have helped redefine faculty roles in recent years. This study seeks to explore the factors faculty deem important when selecting a new colleague. I hope your faculty will be able to assist me in this endeavor by spending 20 minutes reviewing a CV and completing a brief questionnaire. I am a doctoral student and the study is being completed as part of my dissertation.

In the next few weeks, tenure track faculty in your department will be sent an e-mail alerting them of the study and will be sent study materials via U.S. mail with a request to review the CV of an academic engineer. I would appreciate your assistance by encouraging your tenure-track faculty to participate in this study. All of their responses will be confidential and completely anonymous. Data will not be reported in any way that would identify an individual or a particular institution.

The Virginia Tech Institutional Research Board has approved this survey and study. If you have any questions or comments about this study, please contact me, Kelly Oaks, by e-mail at k_oaks@rocketmail.com or by telephone at (540) 961-3468. Additionally if you have questions or concerns regarding the rights of study participants or are dissatisfied at any time with any aspect of this study, you may contact Dr. David Moore, Chair of the Virginia Tech Institutional Review Board, via e-mail at moored@vt.edu or by telephone at (540) 231-4991.

Thank you in advance for assisting me with this endeavor.

Sincerely,

Kelly Oaks

Doctoral Candidate

Appendix E: E-Mail to Faculty

Your institution's department was randomly selected from the membership list of the Council of Industrial Engineering Academic Department Heads to participate in this research study. There have been important changes in higher education in recent years. The emergence of new specialties within disciplines, increased emphasis on interdisciplinary research, the growing importance of copyright patents, and intellectual property issues may have helped redefine faculty roles in recent years. This study seeks to explore the factors faculty deem important when selecting a new colleague. I hope you will be able to assist me in this endeavor by spending 20 minutes reviewing a CV and completing a brief questionnaire. I am a doctoral student and the study is being completed as part of my dissertation.

Within the next few weeks, materials regarding this study will be sent to you via U.S. mail. It is my hope that you will assist me in this research endeavor by participating in the study. All responses will be confidential and completely anonymous. Data will not be reported in any way that would identify an individual or a particular institution.

Thank you in advance for assisting me with this endeavor. It is only through the assistance of individuals like you that my research is possible.

Sincerely,

Kelly Oaks

Doctoral Candidate

Appendix F: Letter for Participants

Dear _____:

Your institution's department was randomly selected from the membership list of the Council of Industrial Engineering Academic Department Heads to participate in this research study. There have been important changes in higher education in recent years. The emergence of new specialties within disciplines, increased emphasis on interdisciplinary research, the growing importance of copyright patents and intellectual property issues may have helped redefine faculty roles in recent years. This study seeks to explore the factors faculty deem important when selecting a new colleague. I hope you will be able to assist me in this endeavor by spending 20 minutes reviewing a CV and completing a brief questionnaire. I am a doctoral student and the study is being completed as part of my dissertation.

I would appreciate your assistance in reviewing the enclosed CV of an academic engineer. The names have been changed on the CV to protect the individual's identity. All responses will be confidential and completely anonymous. Data will not be reported in any way that would identify an individual or a particular institution.

Since I am asking for the responses anonymously, I am not asking you to sign an informed consent form. By completing and returning the survey itself, you are indicating that you have given voluntary consent.

Once you have evaluated the CV, please complete the enclosed questionnaire and return both the CV and questionnaire in the self-addressed stamped envelope.

The Virginia Tech Institutional Research Board has approved this survey and study. If you have any questions or comments about this study, please contact me, Kelly Oaks, by e-mail at k_oaks@rocketmail.com or by telephone at (540) 961-3468. Additionally if you have questions or concerns regarding your rights as a study participant or are dissatisfied at any time with any

aspect of this study, you may contact Dr. David Moore, Chair of the Virginia Tech Institutional Review Board, via e-mail at moored@vt.edu or by telephone at (540) 231-4991.

Thank you in advance for assisting me with this endeavor.

Sincerely,

Kelly Oaks

Doctoral Candidate