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The Influence of Higher Education on Entry Level Law Enforcement Examination Outcomes

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Law Enforcement Entry Level Examination Outcomes

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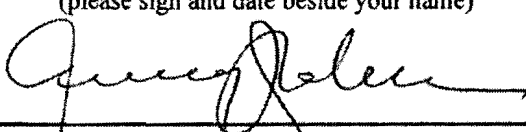
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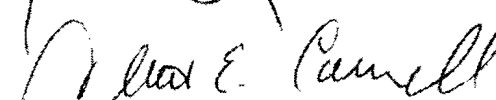
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Abstract

Entry into a career in law enforcement is most often dependent upon the aspiring candidate's relative success on a competitive, written, multiple-choice examination. In the state of New Jersey, as in many states, civil service laws preclude consideration of formal educational attainment when establishing the ordinal, eligibles lists for law enforcement hiring. Furthermore, formal test preparation has materialized as a norm in the pre-employment preparation regimen of many prospective law enforcement candidates. Given the potentially confounding influence of examination preparation or coaching on a study related to examination outcomes, this research was designed to include an analysis of archival data derived from a convenience sample of three hundred and sixty-five ($n = 365$) participants who self-selected into a formal preparatory course prior to the 2010 administration of the Law Enforcement Aptitude Battery (LEAB)™ in New Jersey. This study utilized simultaneous, multiple, linear regression analysis to test the following null hypothesis: Law enforcement candidates who completed a higher education degree do not score significantly different on the multiple-choice Law Enforcement Aptitude Battery (LEAB)™ than law enforcement candidates who have not completed a higher education degree when all of the candidates have been exposed to the same study strategies prior to the administration of the examination. The quantitative analysis utilized in this study accounted for the biographical variables: age, gender, and race, along with each participant's self-reported highest level of education. The qualitative, categorical data was entered into the model using binomial, dichotomous coding. The multiple regression model, with the level of significance set at .05, revealed no statistically significant relationship between the predictor variables and the outcome variable resulting in a failure to reject the null hypothesis.

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Perseverance through the long journey toward the completion of this academic

endeavor could not have been possible without the dedication and guidance of those who

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would obstruct progress. I further express my sincerest thanks to the staff of Seton Hall

University for making my doctoral experience enjoyable from its inception.

Dedication

The commitment of time and resources required for the completion of this endeavor was not possible without considerable sacrifice and support from those to whom I am closest. I dedicate this to Donna, my loving wife, as well as David, Dillon, and Tyler, my three sons who too often had to sacrifice their own needs throughout this process. Their unwavering support served as the motivation I needed to continue on through the toughest of times.

Disclosure Statement

Throughout the period of this study, this researcher served as the Captain of Police for the Lacey Township Police Department as well as the Vice President of Holtz Learning Centers, Ltd. The Lacey Township Police Department is a municipal police agency with jurisdictional policing responsibilities in Forked River, Lanoka Harbor, and Bamber Lakes, New Jersey. The professional development firm, Holtz Learning Centers, Ltd., a private-sector training company based in New Jersey, serves the training needs of law enforcement professionals in New Jersey, New York, and Pennsylvania.

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CHAPTER I

Introduction

The law enforcement community has long been filled with professional men and women who take great pride in public service and hold in high regard the specialized training and skills developed during a career. Although highly specialized training and assignments within the career field are coveted, formal higher educational attainment as a core requirement remains a futuristic concept. The value of higher education as it influences the knowledge, skills, abilities, and personal attributes in law enforcement is much debated and has gained even more relevance in recent years (Stewart, 2006). Over the past century, commissions have been impaneled and research has been conducted resulting in strong recommendations for higher education standards in law enforcement. Despite the nearly one hundred years of effort expended toward establishing educational standards for law enforcement, less than 1% of police agencies have a four-year college degree requirement in the United States (Hickman & Reaves, 2006).

New Jersey, as an example, has more than 190 municipal police departments that fall under both the statutory and administrative code governance of the New Jersey Civil Service Commission (hereinafter referred to as "the Civil Service Commission"). The civil service process in New Jersey provides a neutral entity to oversee and regulate the competitive examination process for both entry level appointment and promotion within "civil service" police departments. New Jersey statutory law, N.J.S.A. 11A:1-1 et seq. (The Civil Service Act) and the associated New Jersey Administrative Code, N.J.A.C. 4A:1-1.1 et seq., establish clear criteria for entry level eligibility requirements and testing. According to the Civil Service Commission, its core mission is to "provide a fair

and efficient human resource delivery system that rewards quality, merit, and productivity in a framework that allows civil service jurisdictions the flexibility necessary to manage their workforce, improve productivity, and provide a more cost effective service delivery for state taxpayers" (New Jersey Civil Service Commission, 2010a).

On a biennial basis, the Civil Service Commission administers a competitive, multiple-choice, entry level examination for the positions of Police Officer (municipal, campus, and Human Services), Sheriff's Officer, and Corrections Officer. For the first time, in 2010, the Civil Service Commission included the position of Parole Officer as part of the Law Enforcement Entry Level Examination (LEE) process. The examination is a selection instrument designed to determine eligibility for available positions within jurisdictions falling under the purview of the Civil Service Commission. An age eligibility requirement exists as well and is as follows:

> Candidates need to be at least 18 years of age on or before the closing date
> shown on the examination announcement. The only title in the Law
> Enforcement Series that has a maximum age is Municipal Police Officer.
> Applicants over age 35 as of the closing date of the examination are not
> eligible for Municipal Police Officer positions, with certain exceptions.
> (An applicant is considered to be over 35 the day after his/her 35th
> birthday.) By law, applicants may reduce their age by deducting the
> following: (1) the amount of their military service time that falls within the
> location and time limit criteria for New Jersey veterans' preference and/or
> (2) the amount of time previously served in certain law enforcement titles.
> To qualify for this provision, separation from prior service must have been

for reasons other than removal for cause on charges of misconduct or

delinquency (New Jersey Civil Service Commission, 2010a).

The eligibility requirements further include: United States citizenship, residency within

the State of New Jersey, GED or high school diploma, and a valid New Jersey driver's

license.

While the Civil Service Commission administers the examination, the

examination is actually developed by EB Jacobs, LLC. Through New Jersey's

competitive bid process, the EB Jacobs Corporation was awarded the contract for the

2010 and 2012 entry level law enforcement examination cycles. The EB Jacobs

Corporation has a long history of developing and administering psychometric tests for

employment purposes. "On January 1, 2004, EB Jacobs purchased the public safety

division of SHL Landy Jacobs to enable the staff to focus on the public safety market in

the United States and to broadly continue [a] tradition of excellence in assessment" (EB

Jacobs, 2009). The industrial-organizational psychologists of EB Jacobs developed a

three-factor assessment referred to as the Law Enforcement Aptitude Battery (LEAB) ™.

The multiple-choice construct of the assessment involves a 48 item, cognitive (written

abilities) section, a 103 item normal personality assessment (workstyles analysis), and a

68 item biodata (life experience) questionnaire. According to EB Jacobs (2009), they

have a "strong history in the development and validation of written (cognitive and non-

cognitive)" assessments (p. 6). The Law Enforcement Aptitude Battery (LEAB)™ was

administered during the fall of 2010 with over 39,000 New Jersey residents applying for

the Entry Level Law Enforcement Examination (New Jersey Civil Service Commission,

2010a).

The three-factor Law Enforcement Aptitude Battery (LEAB)™ provides for an assessment of not only the prospective candidate's cognitive abilities, but also assesses "certain motivational, value-related, and attitudinal characteristics" as well as the candidate's "past history and performance" as deemed to be potentially relevant to performance in the field of law enforcement (EB Jacobs, 2010, p. 1). Two of the three factors or sections of the test are non-cognitive by design, leaving only the 48-item, written abilities section as the sole assessment of candidates' cognitive abilities. According to EB Jacobs (2009), both content and criterion-related strategies were employed to account for test validation relying on a comprehensive job analysis to identify the "knowledge, skills, abilities, and personal characteristics (KSAPs) that are a prerequisite to task performance" (p. 10). Essentially, the Law Enforcement Aptitude Battery (LEAB)™ consists of three independent instruments brought together to form a single, three-factor examination to provide a comprehensive assessment of the prospective law enforcement candidate. According to EB Jacobs (2009):

> Each of these instruments is matched to job requirements and each
>
> assesses a variety of underlying characteristics important in the
>
> performance of the duties and responsibilities of law enforcement officers.
>
> With respect to cognitive abilities, we [at EB Jacobs] measure candidates'
>
> ability to detect problems, use language for both giving and receiving
>
> information, order events, and think logically. On the workstyles and
>
> biodata measures[,] we [at EB Jacobs] are looking for individuals who can

be depended upon to perform their jobs in a conscientious manner,

approach their jobs with care and concern, are motivated and willing to

assume a leadership role, and relate well to others (p. 7).

The Law Enforcement Aptitude Battery (LEAB)™, with its three-factor design, serves as

the model for contemporary entry level law enforcement testing throughout the United

States. As such, the State of New Jersey's decision to utilize the LEAB™ as the 2010

New Jersey Entry Level Law Enforcement Examination (LEE) provides for a greater

degree of relevance in a study conducted regarding New Jersey's entry level law

enforcement testing process.

Beyond the examination instrument and the potential influence of higher

educational attainment on examination outcomes, there are notable concerns regarding

how higher education is viewed under the laws and administrative rules regarding entry

level law enforcement. Conspicuously absent in this assessment and scoring process is

the consideration of the educational attainment of each candidate. A candidate

possessing the minimum hiring requirement of a high school diploma or a certificate of

general education development (GED) receives the same consideration as a candidate

who possesses a master's degree or even a doctorate. No evaluation of educational

attainment is permitted during the examination and scoring process preceding the

promulgation of what the Civil Service Commission refers to as an "eligibles list."

Under New Jersey Law, N.J.S.A. 11A:4-8, the appointing authority must hire from the

eligibles list within a "rule of three." Considering that each eligibles list is produced

based on the respective candidate's performance on the examination, the statutory rule of

three effectively eliminates an employer's ability to impose an educational requirement

under the current civil service system. Although conventional wisdom would tend to

stand for the proposition that higher educational attainment would likely enhance a

prospective candidate's test-taking ability, hence contributing to a higher outcome on the

examination, that question is still in doubt and has not been answered through sound

research. Given the statutory preemptions and emphasis on a single assessment

instrument to determine eligibility for entry into a civil service law enforcement position

in New Jersey, it is essential to investigate and explain whether higher educational

attainment has an influence on examination outcomes.

Statement of the Problem

Policing has been without universal higher education hiring standards despite

independent research, governmental studies, and authoritative literature reinforcing the

axiom that higher education is desperately needed in law enforcement. Despite the

auspicious opinion regarding the value of higher education and its potentially positive

influence on law enforcement, the question is commonly asked, "Should higher education

requirements be established in law enforcement?" Most experts concur that for law

enforcement to keep pace with the complexities of our ever evolving society, the

imposition of a college degree as a rudimentary hiring requirement may be necessary

(CALEA, 2009). Yet, a current state analysis reveals that both the public served by law

enforcement and those who serve in the field of law enforcement appear to be deprived of

the best service available due to the absence of a highly educated workforce.

Historically, harsh opinions have been rendered regarding the perceived lack of

education in law enforcement. An immoderate example emerges through the comments of sociologist Egon Bittner. Bittner, discussing the education level of police officers, has been quoted as stating, "We must abolish permanently the idea that is all too prevalent in our society that if one does not want to do something worthwhile, he can always become a cop" (Bittner, 1970, p. 83, as cited in Carlan & Byxbe, 2000). Such overt dissonance was uttered with respect to the need for more enlightened police officers and is reflective of the public's impression of what is too often perceived to be an undereducated police corps. A true paradigm shift may be necessary for substantive perceptual change to occur. The elusive prospect of change comes with considerable obstacles along the way. "In order to have a chance to become an actual policy, an issue must reach the policy agenda, and this occurs neither automatically nor easily" (Fowler, 2004, p. 181). Realistically, that paradigm shift may only come through valid findings of methodologically sound research to answer the perpetual questions regarding higher education and law enforcement.

On a daily basis, police officers are required to make critical decisions under some of the most trying circumstances, requiring the employment of cognitive, affective, and psychomotor abilities. Such decisions by police officers performing their duties require higher level, critical thinking as the public's ever-growing expectation of exceptional police performance continues to rise (Carlan et al., 2000). The ability to understand the theoretical underpinnings relevant to the discipline along with the ability to comprehend, apply, analyze, synthesize, and evaluate theory and practice can be

enhanced through education (Bloom, Englehart, Furst, Hill & Krathwohl, 1956). Such critical, higher order cognition is unlikely to emerge as a direct product of the traditionally rigid, mechanistic, and highly structured police training process. While training simply focuses on the "how," higher education provides law enforcement officers with the "why," allowing for greater exploration and understanding of the complexities inherent to police work (Roberg, Kuykendall & Novak, 2002). Furthermore, the challenges of the modern era of community policing require critical thought, problem solving, and greater interpersonal skills enhanced through higher education (Kappler & Gaines, 2005).

Efforts to advance law enforcement toward professionalization have been hindered by the tacit avoidance and blatant failure to accept higher education standards as an institutional norm. This is evidenced by the entry level hiring process in most jurisdictions. The process often entails the administration of a written, multiple-choice examination offered simultaneously to a large group of prospective candidates. In many jurisdictions, the single assessment instrument determines eligibility for consideration in rank order based on the respective score achieved on the examination in total disregard of the candidate's credentials. Such a simplistic process effectively discounts a candidate's level of higher educational attainment completely.

Simply stated, public policy is "whatever governments choose to do or not to do" (Dye, 1998). Actual public policy development tends to be a "dynamic and value laden process" which "includes a government's expressed intentions and official enactments as

well as its consistent pattern of activity or inactivity" (Fowler, 2004, p. 9). In 1979, the

New Jersey Civil Service Commission conducted a public hearing to solicit testimony

regarding the establishment of statewide standards for eligibility for admission to the

entry level law enforcement examination (New Jersey Civil Service Commission, 1979).

During the hearing, testimony was received from each of the directors within all divisions

of the Department of Civil Service as well as eleven representatives of individuals,

groups, and municipalities. According to the written order issued on July 17, 1979, by

the Civil Service Commission, the testimony received primarily favored establishing

higher education requirements for entry level law enforcement (p.2). The majority of the

representatives favored at least a one-year higher education requirement for eligibility to

sit for the entry level examination. Although the hearing revealed such findings, the New

Jersey Civil Service Commission decided against acting on the recommendations.

Specifically, the 1979 Commission order stated, "In the absence of a clear showing that

college credit or degree requirements are valid, the Commission orders that the current

requirement of a high school degree or its equivalent be continued as a statewide standard

for admission to Civil Service Police Officer examinations" (p. 4). The outcome of the

hearing reinforced the restriction on individual civil service regulated agencies

establishing their own higher education standards for employment eligibility. The

Commission stated, "It is the responsibility of the Civil Service Commission to set

uniform and definitive standards for employment" (New Jersey Civil Service

Commission, 1979, p. 4). Hence, this decision perpetuated the absence of education

standards beyond the attainment of a high school diploma or GED for entry level law

enforcement eligibility in agencies regulated by the New Jersey Civil Service

Commission. The decision rendered on July 17, 1979, has stood as the status quo for

more than three decades.

The New Jersey Civil Service Commission decision immediately impacted the

local hiring practices of municipal agencies such as the Townships of Clark, Hillside, and

Millburn, along with the City of Clifton. These New Jersey municipalities, among

others, each implemented higher educational hiring standards for entry level law

enforcement within their jurisdictions. The 1979 New Jersey Civil Service Commission

order rendered the local hiring standards as improper and preserved such decisions as

falling exclusively under the authority of the Commission. While seemingly opening the

figurative door to the topic of establishing higher education hiring standards for entry

level law enforcement in New Jersey, the actions leading up to and related to the 1979

Commission order essentially had the effect of closing the door on the topic for the

decades that have followed. Ironically, this action was effectuated during the years

following the recommendation by the National Advisory Commission on Criminal

Justice Standards and Goals (1973) for the incremental implementation of higher

education, college degree standards for entry level law enforcement inclusive of an

associate's degree by 1975 and a bachelor's degree by 1982.

Prospective candidates who have completed a college degree and are competing

for entry level law enforcement positions currently do not derive a specific and direct

benefit in the examination scoring process and subsequent ordinal eligibility ranking. The candidate's eligibility ranking is based solely on his or her score on the written, multiple-choice examination relative to other candidates. This seemingly objective selection process effectively discounts many of the recognized benefits of higher education.

The current research and literature indicate there tends to be a positive relationship between higher education and the enhancement of performance and certain core competencies, including problem-solving, effective decision-making, analytical thought, writing effectively, communicating with the public, and relating to people of diverse backgrounds (Breci, 1994; Smith & Aamodt, 1997; Hardwick Day, 2002). Furthermore, higher education has been found to have a statistically significant ($p < .001$) relationship at the bivariate level with respect to officer level of education and a decrease in the need for the use of force (Ryberg & Terrill, 2010). Likewise, higher education was found to deliver a more humanistic candidate for police work (Carlan & Byxbe, 2000). Officers who have college degrees have expressed the belief that the educational journey required to complete a college degree contributed to enhancing skills related to communications, critical thinking, human relations, along with gaining extensive knowledge of law and procedure highly relevant to the job (Carlan, 2006).

Considering the prior research and the purported benefits of higher education, this study will examine the influence of higher education on multiple-choice examination outcomes. Entry level candidates' level of higher educational attainment and

examination outcomes will be analyzed to determine the influence of higher education on multiple-choice, entry level examination outcomes when participants have been exposed to the same study strategies during a two-day preparation course prior to the administration of the examination. Public policy decision-making regarding higher education standards in law enforcement requires additional research on the topic to provide authoritative information to assist in the making of policy decisions. Individual police department policies regarding higher education standards and incentives are likely to be influenced by methodologically sound research on this topic. Such research may also provide much needed educational career guidance for prospective candidates who aspire to a career in law enforcement. Currently, there is a conspicuous absence of thorough quantitative research on the influence of higher education on entry level law enforcement examination outcomes. Further inquiry is necessary to answer the lingering question of whether higher educational attainment tends to result in higher outcomes on multiple-choice, written, entry level law enforcement examinations.

Purpose of the Study

The purpose of this study is to explain the influence of higher education on entry level law enforcement examination outcomes. Over one hundred years of research and debate regarding the need for higher education standards in law enforcement has been devoid of answers related to the question of whether earning a college degree contributes to higher outcomes on an entry level law enforcement hiring examination. Current high school students who aspire to a career in law enforcement have little guidance from the

existing research as to the direct benefits they will likely derive from earning a college

degree. Such direct benefits include a better chance of scoring high enough on the

eligibility examination to be considered for a law enforcement position. In addition,

career and guidance counselors both in high school and college will have greater insight

to assist in providing effective guidance to students. This study is designed to provide

such valuable information and insight regarding the influence of higher education on

entry level law enforcement examination outcomes.

Significance of the Study

Given the considerable time, effort, and resources required to complete a college

degree and the significant emphasis placed on a single assessment instrument to

determine eligibility for a law enforcement position, it is necessary to examine the factors

that influence outcomes on the entry level examination. An individual's performance on

the examination renders the prospective candidate eligible or potentially ineligible based

not only on whether he or she achieves a passing score, but based on the candidate's

score relative to others who are competing for the very limited number of positions

available in law enforcement. An extensive examination of the research and literature

reveals much about the relationship between higher education and law enforcement, but

does not explain the influence of higher education on entry level examination outcomes.

Consequently, a prospective law enforcement candidate may dedicate considerable time

and financial resources toward the completion of a four-year college degree without

knowing if he or she will be able to successfully achieve an adequate score to render him-

or herself eligible for the desired position.

Although Thomas Whetstone (2000) determined that a relationship exists between

higher education and promotional examination outcomes, his research indicates that

study strategies employed prior to the examination were more of a determining factor in

performance on the actual examination. Whetstone (2000) did not explore entry level

law enforcement testing. This study differs in that it will examine the influence of higher

education on entry level examination outcomes while controlling for the use of study

strategies. Exam preparation or coaching has long been a part of competitive testing in

this country. While many in the field of education refute the efficacy and ethical basis

for formal test preparation, "advocates for minority groups argue that individuals should

be coached on how to respond to mental ability tests to overcome what some regard as

the cultural bias to mental ability tests" (Gatewood, Field, & Barrick, 2011, p. 490). The

participants in this study all engaged in essentially the same exam preparation process

and were exposed to the same study and test-taking strategies prior to the examination.

Much of the research regarding higher education and law enforcement focuses on

incumbents who are current law enforcement practitioners, while the continuing, nearly

century long debate surrounds the necessity of the implementation of universal

educational standards for entry into law enforcement. This study is significant in that it

serves to explain the influence of higher education on entry level examination outcomes,

which has yet to be explained through prior research. Since prospective officers must

score sufficiently on the entry level examination to enter the field of law enforcement, it

is essential to analyze and explain the influence of higher education on such examination

outcomes.

Considering the controversy over the past century regarding the benefit of higher education in law enforcement, this study will provide much needed insight regarding higher education and success in the competitive examination process. Candidates who desire a law enforcement position will have a greater understanding of the potential influence pursuing higher education may have on their respective examination outcomes. For the individual, such understanding may have a profound influence on the steps the individual takes toward entering the law enforcement field.

From a public policy perspective, this study was intended to provide much needed information to build on the existing body of research and literature regarding higher education and law enforcement. Much of the existing research focuses on the need to implement entry level, higher education eligibility standards as well as investigating the correlation between higher education and performance in the field. Beyond entry level law enforcement testing, the prospect that higher education has an influence on examination outcomes may further influence public policy decisions regarding the establishment of educational standards for rank positions in law enforcement as well. Based on current practice in New Jersey, a de facto policy exists to discount higher educational attainment from consideration in law enforcement hiring and promotion. An unstated policy is a policy nonetheless if carried out in actual practice (Dye, 1998; Fowler, 2004). Implicitly, corroborating that competitive testing is uninfluenced by higher educational attainment may be as profound a finding from a policy perspective as discovering that higher educational attainment influences examination outcomes.

Theoretical Rationale

"There are laws and theories that govern the world, and these need to be tested or verified and refined so that we can understand the world" (Creswell, 2009, p. 7). The predominant theory among law enforcement experts over the past century is the belief that higher education is necessary for the professionalization of policing and directly contributes to positive outcomes in the field. Unfortunately, much of the theory postulated is based on anecdotal stories and not founded in fundamentally sound research (Bostrom, 2005). Researchers have long questioned the modality of studies conducted into the topic of whether college truly matters (Kenny, Lee, Maddala, & Trost, 1979). The most notable government commissions empanelled in the 1960s and 1970s derived strong opinions and corresponding recommendations primarily through the review of such anecdotal accounts. Throughout history, the theoretical basis for the requirement of higher education in law enforcement centers on the belief that higher education will produce a police officer who is professional, has high job satisfaction, and possesses certain core competencies believed to be gained through formal education (Breci, 1994; Smith & Aamodt, 1997; Varricchio, 1998; Hardwick Day, 2002).

Theoretically, the basis of the analyses in this study exists in the realm of education production-function as posited by Hanusheck (1979). Viewed from the perspective of evaluating the efficacy of higher education as an input or product, performance on the examination may then be viewed from the perspective of a function or output. According to Hanusheck (2007), "The most frequently employed measure of

schooling has been attainment or simply years of school completed" (p. 1). Years of school completed comes with the stark reality that vast resources must be dedicated to higher education and the earning of a college degree. Fortunately, the focus over time has properly shifted to student performance, the output, rather than continuing the futile emphasis on the resources or inputs (Coleman, Campbell, Hobson, McPartland, Mood, Weinfield, & York, 1966). For those who aspire to a career in law enforcement as they ascend through the later years of high school, the question needs to be answered whether the significant commitment to attaining a college degree is a positive influence on one's success in entering the field of law enforcement. The primary focus in answering this question must be on the function or output without making the assumption that the product or input automatically equates to success. Many attempts at research related to education production-function have been less than methodologically sound and consequently have yielded results of limited value (Krueger, 1999).

While the prior research and literature emphasize and most often advocate higher education as a fundamental requirement for law enforcement, ultimately this study centers more on the issue of whether the time, effort, and resources dedicated to earning a college degree effectively translate to a greater degree of success on the entrance examination designated as the mechanism to assess eligibility for the field of law enforcement. The product in this analysis (higher education) relates directly to the function (outcomes on the examination), as the assessment instrument serves as the sole determinant for eligibility and ranking on a hiring list.

An expansion of production-function can be observed and analyzed in the broader context of higher education positioned as the product while effective law enforcement serves as the function. It is recognized that achievement, as evidenced by the performance on a single- assessment instrument, may be measured at what can be considered a discrete point in time, while the education process is cumulative in nature (Hanusheck, 2007). Information learned in early education may influence a student's performance years later. That is a theoretical perspective recognized in much of the prior research regarding higher education and law enforcement. The function or output of this study is ultimately being assessed against what would be interpreted as the cumulative effect of higher education on the knowledge, skills, abilities, and personal characteristics enhanced or gained through the associated years of college. This assessment is important, as "little evidence exists to suggest that any significant changes in student outcomes have accompanied [the] growth in resources" dedicated to education (Hanusheck, 2003, p. 67). This assertion reinforces the necessity of this study to explain the relationship between higher education and entry level law enforcement examination outcomes.

Many of the prior studies related to higher education fall within such a broad context since, ultimately, the significant commitment and expense associated with earning a college degree must inevitably be weighed against the perceived or actual benefit of such a degree. So, while the long history of inquiry establishes a basis for holding the post-positivist belief that earning a college degree is a positive step toward

better law enforcement, the inquiry undoubtedly includes an assessment of the cost versus the benefit. From a research perspective, "post-positivists hold a deterministic philosophy in which causes probably determine effects or outcomes" (Creswell, 2009, p. 7).

Although there is a strong theoretical foundation for the transmitting of knowledge by the teacher and the assimilation of knowledge by the student in the college setting that is worthy of an in-depth discussion (Bertrand, 2003), this study focuses not on epistemology, but on the efficacy of earning a college degree in the furtherance of achieving success in entering the field of law enforcement. This study, from the theoretical basis of education production-function, will provide valuable insight regarding the influence higher educational attainment has on examination outcomes, while the singular examination serves as the gate-keeping device for entry into the field. Clearly, aspiring law enforcement officers must engage in an evaluative period to determine the path they will travel toward achieving their career goals and aspirations.

Null Hypothesis

Law enforcement candidates who have completed a higher education degree do not have significant score differences on the multiple-choice Law Enforcement Aptitude Battery (LEAB)™ than law enforcement candidates who have not completed a higher education degree when all of the candidates have been exposed to the same study strategies prior to the administration of the examination.

$$H_0 = \beta_1 = \beta_2 = \ldots = \beta_k = 0$$

Research Questions

Since the main focus of this study is to ascertain how much variance in multiple-choice Law Enforcement Aptitude Battery (LEAB)™ outcomes is explained by the level of educational attainment of the candidate taking the examination, this study will address the following research questions:

1. How much variance in multiple-choice Law Enforcement Aptitude Battery (LEAB)™ outcomes is explained by the attainment of an associate's degree?

2. How much variance in multiple-choice Law Enforcement Aptitude Battery (LEAB)™ outcomes is explained by the attainment of a bachelor's degree or master's degree?

Dependent/Independent Variables

The dependent variable in this study is examination outcomes on the biennially administered, multiple-choice Law Enforcement Aptitude Battery (LEAB)™ as administered by the New Jersey Civil Service Commission (NJCSC) under the title of the New Jersey Entry Level Law Enforcement Examination (LEE). The official examination outcomes are released by the New Jersey Civil Service Commission several months after the administration of the examination. The quantitative outcome variable in this study consists of interval data, while the predictor variables in this study consist of qualitative data in the form of categorical information requiring conversion to binomial, dichotomous coding to allow for quantitative analysis through simultaneous, multiple, linear regression.

The independent variables include: gender, age, race, and level of higher education (high school diploma or GED with no degree earned, associate's degree completed, or bachelor's degree completed/master's degree completed). With the exception of age, the predictor variables required binomial, dichotomous coding to be entered into a simultaneous, multiple, linear regression equation. The dichotomous variables, gender and race, are each coded (0,1) to represent male/female and White/non-White, respectively. All participants in the sample are high school graduates or completed a GED. To allow for dichotomous coding of the qualitative levels of education and to provide for a viable regression model, aggregation of the levels of higher education was necessary (Leech, Barrett, & Morgan, 2011, p.106). The aggregation resulted in the level of education categorization and coding as follows: Other than High School or GED/High School or GED (0,1); Other than Associate's Degree/Associate's Degree Earned (0,1); and Other than a Bachelor's or Master's Degree/Bachelor's or Master's Degree Earned (0,1).

Definition of Terms

Appointing Authority - The designated representative from a municipality who holds the specific authority to appoint personnel to permanent positions within the municipality.

Associate's Degree - The completion and award of a post-secondary, two-year, higher education degree in an undergraduate course of study in a college or university accredited by an agency recognized by the Office of Postsecondary Education (OPE) within the United States Department of Education.

Bachelor's Degree - The completion and award of a post-secondary, four-year, baccalaureate degree in an undergraduate course of study in a college or university accredited by an agency recognized by the Office of Postsecondary Education (OPE) within the United States Department of Education.

Certification - The New Jersey Civil Service Commission (NJCSC) formal legal process under N.J.A.C. 4A:4-1 requiring the promulgation of a rank order list of eligibles for the appointing authority to consider for hiring to permanent service.

Closing Date - The established and posted date for an examination to be utilized to determine eligibility for the particular examination. The closing date for the 2010 Entry Level Law Enforcement Examination was established as August 31, 2010.

EB Jacobs, LLC - A for-profit, private corporation based out of State College, Pennsylvania, staffed with industrial-organizational psychologists specializing in the development and administration of public sector human resource assessment instruments.

Eligibles List - A rank order certified list promulgated by the New Jersey Civil Service Commission providing the names of candidates for appointment to designated job titles.

Eligibles Pool - A database of applicants who received a passing score on the Entry Level Law Enforcement Examination (LEE). The Civil Service Commission maintains the database and utilizes the pool of eligibles to promulgate hiring lists for requesting jurisdictions. The eligibles lists are most commonly promulgated in rank order based on test score and are specific to the candidates' respective jurisdiction of residence.

Entry Level Law Enforcement Examination (LEE) - The biennial examination administered by the New Jersey Civil Service Commission to produce a pool of eligible

candidates to be considered for appointment to specified law enforcement titles within

jurisdictions regulated by the Civil Service Commission. The particular assessment

utilized as the LEE in 2010 was the Law Enforcement Aptitude Battery (LEAB)™ as

developed by the EB Jacobs Corporation.

Exam Preparation Course - A two-day, sixteen hour, formal preparatory program

designed specifically to teach study strategies and examination strategies to improve

performance on the entry level law enforcement examination.

Higher Education - The course of instruction which is provided by public institutions of

higher education and equivalent private institutions pursuant to New Jersey State Statute

18A:1-1, and is accredited by an appropriate accrediting body recognized by the Office of

Post-secondary Education (OPE) within the United States Department of Education.

Law Enforcement Aptitude Battery (LEAB)™ - A nationally utilized, proprietary

assessment instrument developed by the EB Jacobs Corporation specifically to assess

prospective law enforcement candidates. The assessment battery consists of three

independent and unique instruments which in combination form the LEAB™.

Life Experience & Background Survey - The 68-item biodata assessment instrument

utilized as one of three factors within the Law Enforcement Aptitude Battery (LEAB)™

as designed by the EB Jacobs Corporation.

Master's Degree - The completion and award of a graduate level degree beyond the

completion of a bachelor's degree in a course of study in a college or university

accredited by an agency recognized by the Office of Postsecondary Education (OPE)

within the United States Department of Education.

New Jersey Civil Service Commission - The formal commission established in New Jersey pursuant to the Civil Service Act, N.J.S.A. 11A:1-1, et seq., which is charged with the authority and responsibility to promulgate procedural rules via administrative code and charged with the responsibility to carry out the statutory mandates of the Civil Service Act.

Rule of Three - Under N.J.S.A. 11A:4-8, the New Jersey Civil Service Commission has a statutory obligation to certify the three eligibles who have received the highest ranking on an open competitive list for the first known vacancy to be filled by the respective appointing authority. For each additional known vacancy for which a certification is issued at that time, the commission has a statutory obligation to certify the next ranked eligible. The appointing agency is required to select within a range of the top three candidates for each respective vacancy.

Workstyles Questionnaire - The 103 item normal personality assessment instrument utilized as one of three factors within the Law Enforcement Aptitude Battery (LEAB) ™ as designed by the EB Jacobs Corporation.

Written Abilities Instrument- The 48 item cognitive assessment instrument utilized as one of three factors within the Law Enforcement Aptitude Battery (LEAB)™ as designed by the EB Jacobs Corporation.

Limitations of the Study

This non-experimental, quantitative study is designed to explain the influence of higher education on entry level law enforcement examination outcomes. The primary independent variable being assessed is the level of educational attainment of prospective law enforcement candidates in disregard of other important variables found to influence

student performance, such as, family involvement, peer relationships, teacher quality, and student motivation (Hanucheck, 2003). Given the varied approaches utilized throughout the country to assess prospective law enforcement candidates, this study focuses on one commonly used assessment method; that is, standardized, multiple-choice written testing. The particular assessment instrument from which the outcome variable for this study is derived is widely used throughout the United States and serves as an excellent example of the evolution of entry level law enforcement testing in America. Due to the three-factor construct and more prevalent usage of the proprietary Law Enforcement Aptitude Battery (LEAB)™, the results of this study may be relevant beyond New Jersey and the New Jersey Civil Service Commission. Yet, the results are limited to multiple-choice, written examination outcomes and do not reflect the influence of higher education on overall success in entering the field of law enforcement. The results reflect upon merely the initial step and account for a candidate's success in achieving a higher score on the eligibility assessment which effectively renders the candidate eligible to continue in an otherwise rigorous selection process. This is not uncommon in our society, as historically student outcomes in relation to inputs are commonly assessed based on the administration of standardized examinations (Hanusheck, 2003).

This study relies upon the Law Enforcement Aptitude Battery (LEAB)™ as a valid and reliable assessment instrument. In their company literature, the exam developer, EB Jacobs, LLC, attests to both content and criterion-based validation of the Law Enforcement Aptitude Battery (LEAB)™. Furthermore, the New Jersey Civil Service Commission has accepted the assessment as meeting not only the requirements for validity and reliability, but also the strict standards of the United States Department of

Justice with respect to the potentially adverse influence the examination may have on a protected class of applicants. This researcher cannot personally attest to the content validity or the criterion-based validity of the Law Enforcement Aptitude Battery (LEAB)™ as no independent analyses were conducted by this researcher. This researcher has conducted this study with the assumption that the Law Enforcement Aptitude Battery (LEAB)™ is a valid and reliable assessment instrument.

The participants in this quantitative study all completed a two-day, sixteen hour, preparatory course designed to desensitize candidates to the testing process as well as teach candidates helpful study and examination strategies to enhance performance on an entry level law enforcement examination. Although the candidates all attended the preparatory course, this researcher cannot account for individual motivation levels nor the time each candidate dedicated to studying the prescribed strategies prior to the examination. This study did not require students to log either the time spent studying, nor did this study involve questioning students as to the strategies each actually employed while taking the actual examination. Each of the candidates assessed in this study attended the preparation course, and the intent of this researcher was to control for formal exam preparation as a potentially confounding variable. "Confounding variables limit our ability to understand [the] relations between variables because they won't allow us to logically distinguish between alternative explanations" (Nolan & Heinzen, 2008, p. 16). This researcher cannot account for the individual candidate's application of the concepts and principles taught in the exam preparation course.

This study relied upon archival data collected from a convenience sample of candidates who participated in a for-profit, private, law enforcement examination

preparation course. "A convenience sample is one that uses participants who are readily available, as opposed to randomly selecting participants from the entire population of interest" (Nolan et al., 2008, p. 155). The data, which included the candidate's gender, age, race, and level of education, was made publicly available in combination with the candidate's final score on the 2010 Entry Level Law Enforcement Examination (LEE). The data related to examination outcomes were compiled by the Civil Service Commission and made publicly available through a records request application pursuant to the New Jersey law regarding public access to government records, commonly referred to as the Open Public Records Act (OPRA), under N.J.S.A. 47:1A-1, et seq. The candidates self-reported the biodata information voluntarily without independent verification of the veracity of the information provided. This researcher relied upon the archival data as accurate and representative of the candidates who provided the information.

"Those who engage in [quantitative research] have assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate the findings" (Creswell, 2009, p. 4). With respect to the ability to generalize the findings in this study, the applicability may be limited to jurisdictions throughout the United States who rely upon written, multiple-choice examinations of similar construct as the Law Enforcement Aptitude Battery (LEAB) ™ as their selection or de-selection instrument. Although the LEAB™ is a widely employed assessment instrument for entry level law enforcement, individual police departments and civil service agencies throughout the United States utilize varied approaches in developing eligibility lists. Each state, and even some political

subdivisions within each state, has regulatory codes and civil service statutes which may reflect differing requirements from those presented in this study.

The absence of random sampling further limits the ability to generalize the results of this study to a larger population. "A convenience sample usually limits our generalizability--our external validity. This means that we can never be certain that results from our sample apply to the larger population of interest" (Nolan et al., 2008, p. 158). The biodata utilized as the independent variables in this study were derived from participants who self-selected their participation in formal examination preparation. This study may be influenced by self-selection bias, as this researcher was unable to control for the difference in the individual attributes of each participant (Kenny et al., 1979). Given the participants' personal choice to engage in a formal preparatory program, those participants who achieved only a high school diploma at the time the data were collected may actually be higher academic achievers than those participants who completed a college degree. The decision to spend the time, money, and effort to attend a preparatory course implicitly conveys a degree of conscientiousness and awareness for a high school graduate who has yet to complete a college degree. To the contrary, one may reasonably infer that the decision by a person who has completed a college degree to spend the time, money, and effort to attend a preparatory course for a basic entry level examination may be indicative of the tendency to be a lower academic performer. The inability to control for this confounding variable through an independent, alternate assessment of prior academic achievement potentially limits the findings of this study. Ideally, biodata related to SAT score or grade point average (GPA) in high school for all participants would provide interval data suitable for analysis as a measure of academic achievement

level. Due to the dependence on limited archival data, a measure of academic

achievement was not available for this study.

This study does not account for the order effect phenomenon, as additional data

were not acquired to assess each participant's history of prior exposure or attempts with

the Law Enforcement Aptitude Battery (LEAB)™ or a substantially similar assessment

instrument. Order effect, also referred to as practice effect, "occurs when taking a test the

first time changes the results of taking the same test a second time" (Nolan et al., 2008, p.

233). The competitive nature of law enforcement testing and the strict ordinal ranking of

candidates based on the numerical examination outcomes tend to result in prospective

law enforcement officer candidates taking the examination multiple times prior to

successfully being hired (Gatewood et al., 2011). As such, a candidate's repeated

exposure to the unique construct and components of the assessment may provide an

advantage via an order effect on subsequent administrations of the examination. Despite

varied versions of the same instrument, order effect remains a concern. According to

Gatewood et al. (2011), there are three possible explanations for an increase in

performance through the order or practice effect. The explanations include test

candidates developing a greater understanding of the testing format, a reduction in test

anxiety, and enhanced learning of the necessary skills being tested. Each of the reasons

presented are believed to come as a result of repeated exposure to the same type of test

instrument. This study does not include data to control for a candidate's prior experience

with the LEAB™ nor the candidate's prior experience with other similar forms of

cognitive, normal personality, and biodata assessment.

II. REVIEW OF THE LITERATURE

Introduction

The topic of higher education standards for law enforcement has been the focus of considerable research and literature for over a century. As such, there are countless articles and literary references available for review extending across decades of independent research and writing. The breadth of available material required extensive review and critique to determine which works capture the essence of higher education in law enforcement. This review will focus on the past twenty years of peer-reviewed research, while inclusive of the seminal research chronicled over the past century, along with the most authoritative literature on the topic. Research of less than fundamentally sound methodology and/or literature of a less than adequate experiential basis have been excluded from this review.

For the purpose of providing a comprehensive and coherent literature review on the broad topic of higher education in law enforcement--more specifically, higher education as it relates to entry into law enforcement--this review consists of nine sections beyond this introduction. The first section establishes the historical foundation of the endeavor to bring higher education standards to law enforcement. The second section centers on the necessary distinction between college education and vocational training, while the third section explores the conception of universal standards for law enforcement. The fourth section provides a comprehensive review of the relevant law related to educational employment standards for law enforcement, while the fifth section delves into higher education at the entry level. The sixth section focuses on the concept

of professionalism, while the seventh section explores the influence of higher education on law enforcement behavior. The eighth section focuses on the detractors and critics of higher education in law enforcement, while the ninth and final section is the conclusion.

Throughout this review of the related research and literature, reference to the term "higher education" generally relates to the completion of a four-year bachelor's degree; and in some specified instances, 18 or more college semester hours leading toward a two-year associate's degree, as provided by a public or private institution of higher education which is accredited by a recognized accreditation association (N.J.S.A. 18A:1-1, 2010). This broad definition which extends across a continuum of 18 college credits to the completion of a four-year degree is reflective of the variation of how "higher education" has been operationalized as an independent variable in the research and literature. Such ambiguities in terminology and variations across studies will be clarified as appropriate.

The search techniques employed during this literature review include a comprehensive physical review of the graduate level textbooks utilized over the past fifteen years during a course of study in educational leadership, management, and policy, as well as study in law enforcement supervision, management, and administration. The search techniques further included a basic Google search utilizing the following keywords and phrases: higher education, education, college, education standards, law enforcement, police, police work, testing, examination, entry level law enforcement, assessment, police testing, and hiring requirements. Based on the Google search results, peer reviewed articles were identified and subsequently located using the Seton Hall University website, Walsh Library, e-journal student resource. Peer-reviewed journal

articles were retrieved, when available, from the Seton Hall website using the specific

journal name, issue, and article title gained from the preliminary Google search. Articles

not available through the Seton Hall Website were purchased from the respective

vendors, i.e., Sage Publications, ProQuest, Emerald, Academic Search Premier, and

ERIC. Upon retrieving relevant articles, the resources cited within were explored to

identify other sources of timely research for retrieval and review.

Historical Foundation

The influence educational attainment has had on the field of law enforcement

touches on seemingly countless facets of the inherently complex endeavor referred to as

"police work." To fully understand the emphasis on higher education in the field of law

enforcement, it is essential to explore the historical context of the modern policing system

and the resultant emphasis on education and training. The conception known as the

modern policing model was born in the middle of the nineteenth century and ultimately

expanded through the work of August Vollmer in the early nineteen hundreds

(Schmalleger, 1995). In 1905, August Vollmer was elected as the town marshal for

Berkeley, California, and served until 1909 when Berkeley established a formal police

force with Vollmer serving as the town's first chief of police (Carte & Carte, 1975).

Vollmer, who later served as a professor of police studies at the University of California

at Berkeley, has been credited with establishing the first standards for the training of law

enforcement personnel (Swanson, Territo & Taylor, 2005). Vollmer was further credited

with establishing the first formal training academy for law enforcement and emphasized

recruitment from the ranks of active college students (Holden, 1994). As a springboard

for future emphasis on higher education for law enforcement, Vollmer participated in

establishing the first college- based curriculum in police science while serving as a

professor at the University of California at Berkeley (Johnson & Wolfe, 1996). Any

literature review related to the topic of higher educational standards in law enforcement

should appropriately reference Chief August Vollmer for his notable contributions. As

such, he is often affectionately referred to as the "father of modern policing" (Wilson &

McLaren, 1977). Prior to his laudable efforts, there was simply no connection between

higher education and the field of law enforcement. Vollmer's contribution to the

professionalization of law enforcement carried on through the years due to the profound

influence he had on others, including his most notable officer and student, O.W. Wilson

(Bennett & Hess, 2007). Orlando W. Wilson graduated from the University of California

at Berkeley in 1924 and continued in the traditions of his mentor, August Vollmer, by

promoting higher education and training standards for law enforcement.

Although law enforcement generally lacked higher education standards during the

early part of the twentieth century, basic education requirements of a high school diploma

for entry into the field had become relatively common. Interestingly, law enforcement,

through having a high school diploma requirement, was distinguished and in some

respects ahead of the educational curve in its early inception. During a time when a large

portion of society did not complete high school, many police officers entering the field

were required to possess a high school diploma (Caldero & Crank, 2000).

Police officers possess considerable authority to enforce laws and directly

influence the liberty enjoyed by free citizens, and as such, there was recognition that at

least a high school diploma should be required given such authority. Logically, this early recognition of the complexity and vast authority of the position and the value of education should have been a natural starting point for a progression toward higher education standards in law enforcement. One would certainly have expected the educational requirement to have increased at least proportionately with the increase in the complexity of the job (Stecher, 1988). History demonstrates that progress has been very slow in this respect.

In the years that followed, recognition of the need for higher education in law enforcement continued. In 1929 President Herbert Hoover appointed George Wickersham to chair the National Committee on Law Observation and Enforcement, which became popularly known as the Wickersham Commission (Swanson et al., 2005). Although the Commission was formed to investigate the lack of enforcement of the Prohibition laws, the final reports by the Commission addressed areas more consistent with professionalization of law enforcement in the United States. Strecher (1988) notes that the Commission and August Vollmer did not specifically cite education as one of the ten Wickersham Commission recommendations, yet Vollmer and the Commission did emphasize higher education repeatedly in the report. In one instance, the report made reference to the fact that only through education will the police be able to deal with current and future crime trends (Strecher, 1988). O.W. Wilson also served with his mentor, August Vollmer, as a member of the Wickersham Commission. Wilson became closely aligned with Federal Bureau of Investigation Director J. Edgar Hoover, who himself was a very strong advocate of professionalism through higher education in law

enforcement (Bopp, 1977). Collectively, these advocates for higher education had a

profound influence on the advancement of training and education in law enforcement

from 1905 through 1972.

The tumultuous historical events of the 1960s and early 1970s, including

increasing crime rates and aggressive police strategies targeting civil rights protesters and

Vietnam War dissenters, led to police-community relations falling into a state of dire

crisis (Walker, 1998). In the wake of unprecedented scrutiny of the state of policing in

America, several governmental commissions were empanelled and studies conducted.

These commissions and related studies will be referenced in this review, as they followed

the Wickersham Commission, and each had an influence on higher education in law

enforcement. The studies and commissions formed through the United States

Government from 1967 through 1978 included: The President's Commission on Law

Enforcement and Administration of Justice (1967), the National Advisory Commission

on Civil Disorders (1968), the National Commission on the Causes and Prevention of

Violence (1969), the President's Commission on Campus Unrest (1971), and the National

Advisory Commission on Criminal Justice Standards and Goals (1973). The

recommendations of each of these commissions were consistent in advocating higher

educational standards to "create a more efficient and professional police service"

(Stewart, 2006, p. 2). As evidenced by the listing of governmental studies, the 1960s

and1970s brought resurgence in the concerted effort to investigate and promote higher

education in law enforcement. The basic theme of the 1960s centered upon the

proposition that educated police officers would result in better delivery of police services

(Dorsey, 1993). A large body of research into the relationship of higher education and police performance was completed in the 1970s and funded by the United States Department of Justice. Collectively, these studies reveal that police officers who were college educated tended to have better interactions with people in the communities they served as well as better ratings of their performance by supervisors (Cascio, 1977).

As a response to The President's Commission on Law Enforcement and Administration of Justice (1967), the United States Congress passed The Omnibus Crime Control and Safe Streets Act of 1968, which established the Law Enforcement Assistance Administration (LEAA). The LEAA administered the Law Enforcement Education Program, known as "LEEP." The intent of the program centered on the belief that education would provide police officers with greater understanding of the varying factors in the social milieu as well as improved decision making (Carter, Sapp, & Stephens, 1989). Foster, Magers, and Mullikin (2007) reported the LEEP program provided grants and loans to serving law enforcement officers, and established certain conditions which needed to be met by institutions that accepted the funds. In order to participate, the institutions were required to offer criminal justice related courses. Their research indicates that in the first year (1969) of the LEEP program, 485 institutions accepted students and the associated funds. In 1977, Herman Goldstein stated, "Few efforts to improve police operations [during these years] have received such enthusiastic and widespread support as the general notion that police officers should be college educated" (Goldstein, 1977, p. 283, as cited in Holden, 1994).

The LEEP program contributed to the progression of higher education in law

enforcement through the infusion of much needed money. Yet, despite its positive influence, the LEEP program was not without controversy. During the administration of President Carter, LEEP controversy erupted among some police executives. The United States Justice Department propounded several requirements for eligibility to obtain agency assistance grants. The requirements included the practice of providing college graduates with priority in hiring over those candidates who did not graduate college. Another requirement involved efforts be undertaken to ensure proportionality in the hiring of African Americans with such hiring numbers being based on the census records for the respective jurisdiction.

According to the literature, President Carter abruptly cut the funding for the LEEP program. According to Carter and Sapp (1990), President Carter was reportedly upset with some of the mandates within the program, especially those which may have affected his hometown. With respect to the LEEP program, multiple authors discuss President Carter's abrupt end to what was deemed by many to be an important step in promoting professionalism in law enforcement (Foster et al., 2007; Carter et al., 1990; Polk & Armstrong, 2001).

Several outcomes related to law enforcement and higher education came from the LEEP program. According to Carter et al. (1990), LEEP resulted in an increase in the number of active police officers with college degrees, and the end of the LEEP program did not adversely affect the expansion of criminal justice education in the United States. Many considered the LEEP program a success overall, as it effectively increased the number of criminal justice programs which continued to serve officers through the

decades that followed (Foster et al., 2007). Similarly, according to Foster (2007), the LEEP program did bring needed attention to the inception of minimum education requirements in many states that actually survived well beyond the life-span of LEEP funding. Although most of the minimum requirements related only to high school diplomas and GEDs, LEEP's influence on education in law enforcement should not be understated.

The National Advisory Commission on Criminal Justice Standards and Goals (1973) pointed out the conspicuously low educational standards as well as a marked failure to actively recruit candidates for careers in law enforcement who have higher educational backgrounds. Such criticism, for the most part, went unheeded by the criminal justice field as a whole. The 1973 Commission recommended various minimum higher educational requirements which included time-lines and education levels. Based on the Commission's report in 1973, it was recommended that police agencies implement college requirements for prospective candidates, which included the completion of two years of college by 1975, three years by 1978, and a bachelor's degree by 1982. This aggressive time-line was never universally implemented and remains the subject of much debate even today. On the federal level, minimum education standards had long been imposed as initiated by the Federal Bureau of Investigation during J. Edgar Hoover's reign as director. Significantly prior to this 1973 report, the FBI and the Secret Service set educational requirements at a bachelor's degree for entry into either federal service (Saunders, 1970) while most law enforcement agencies disregarded the Commission's recommendations.

The recommendations of the National Advisory Commission on Criminal Justice Standards and Goals (1973) and the subsequent cessation of LEEP funding were followed by a period of minimal research on higher education and law enforcement. Historically, there is a conspicuous absence of related research for the period after LEEP ceased to exist through the 1980s. It was not until the late 1980s and early 1990s that research had begun to again focus on the value of higher education in law enforcement.

Very few agencies actually began implementing higher education standards following the 1973 report and during the period LEEP funding was available. In 1974, the Tulsa Police Department in Oklahoma imposed an 18 college credit requirement following the release of the National Advisory Commission on Criminal Justice Standards and Goals (1973). According to Carter, Sapp, & Stephens (1988), Tulsa's policy was a direct result of the President's Commission on Law Enforcement and Administration of Justice (1967) and the National Advisory Commission on Criminal Justice Standards and Goals (1973). The Tulsa policy provided a graduated scale from the base of 18 college credits along a specified time-line with the intent of imposing a four-year bachelor's degree requirement by 1985. The Tulsa police department ultimately capped their college credit requirement at 108 due to concerns regarding potential disparate impact claims (Carter et al., 1988). This concern, among others, of reducing the applicant pool, were not exclusive to the Tulsa Police Department, as such concerns were recognized later in a 2004 National Institute of Justice report. The United States Department of Justice commissioned the National Institute of Justice to perform a study addressing the hiring practices of police agencies. The 2004 report, entitled,

"Research for Practice--Hiring and Keeping Police Officers," addressed the issue of

higher education in the context of hiring standards by stating, "In the current

environment, some agencies may feel pressure to lower standards. Although higher

recruiting standards, such as requiring a college degree, may contribute to applicant

shortages, agencies must consider the demands of contemporary policing" (p. 6).

Carter, Sapp and Stephens (1989) authored, "The State of Police Education:

Policy Direction for the 21st Century," reporting on their analysis of police agencies

throughout the United States. A representative sample of law enforcement agencies from

all levels of government were analyzed, considering their college recruitment procedures,

education related policies, tuition reimbursement practices, retention rates, degree

incentive pay, and the effect any minimum education requirements had on minority

recruitment. Carter et al. (1989) found that educational achievement was consistently

reported as a positive factor in the agencies they surveyed. The agencies had

requirements spanning from as low as 18 college credits to as much as a bachelor's

degree.

Carter and Sapp (1990) utilized specific data derived from three separate studies

conducted in 1960, 1970, and 1974, to compare with the aforementioned 1998 study they

conducted. The analysis and comparison was conducted to determine the pattern of

growth of higher education in the United States among police officers. The data revealed

that in 1960 only 2.7% of police officers had earned an undergraduate degree. In 1988,

the percentage of officers holding an undergraduate (four-year) degree had risen to 22.6%

over the 28 year period. Their findings in 1988 also included 42.6% of officers having

"some college" through the completion of a two-year degree. The 1990 findings of Carter and Sapp revealed that 65.2% of active law enforcement officers reported having completed some level of formal college education.

Due to distinctions in how variables were operationalized, some of the research and literature throughout the years appear to have notable discrepancies. For example, Nemeth (1989) reported the number of criminal justice programs available in Pennsylvania as 64 in 1968, while Palmiotto (1981) reported that 67 criminal justice programs were available in 1960 which expanded to 125 by 1965. As necessary with any research, it is essential to perform a critical reading of the study with specific attention to the methodology to determine what criteria was applied, and more specifically, how the variables were operationalized. Scrutiny of Nemeth's 1989 study reveals he did not include community college programs while counting only those criminal justice programs in four-year colleges and universities. Palmiotto (1981) actually included criminal justice programs in community colleges as well. Such a distinction in the scope of "criminal justice programs" within each study explains the disparity between the two researchers' findings. Regardless of the numerical disparity, both studies determined that a growth was occurring in the offering of criminal justice programs in the 1960s in Pennsylvania. The growth revealed in both studies was said to be attributable to the maturing of law enforcement as a profession (Nemeth, 1989). The collective opinion in the 1960s centered on the belief that an improvement in the delivery of police services was dependent upon increasing the formal education of police officers (Kappeler & Gaines, 2005).

According to Polk and Armstrong (2001), more than half of the law enforcement officers in the United States have some college education, although the number of agencies requiring higher education is very low. According to Hickman and Reaves (2006), less than 1% of police agencies have a four-year degree requirement in the United States. Polk et al. (2001) also observed that an increasing number of agencies require some level of higher education attainment in order to enter the police ranks. They note that many law enforcement agencies are offering incentives for officers with college education. According to their research, most of the incentive programs include a graduated scale reward system based on the accrual of credit hours (Polk et al., 2001).

In 1985, the Largo Police Department in Florida implemented a policy requiring 35 college credits for entry level applicants. The Largo Police Department instituted the policy with a well defined graduated scale which increased the requirement progressively to 120 college credits in 1989. In defending the policy, the Largo Police Department cited various reasons for the educational standard. The reasoning included such positive aspects as enhanced decision making, heightened professionalism, greater degree of comprehension of laws and regulations, mitigation of civil liability, and greater career satisfaction (Carter et al., 1989).

During Benjamin Ward's term as the New York City Police Commissioner in the late 1980s, he instituted a policy directive in 1988 governing educational standards. The policy specified that a police sergeant or lieutenant was required to complete 64 college credits by the time the sergeant reached his or her 18-month probationary period within the respective rank attained. His recommendations were presented on the basis of the

President's Commission and the New York Mayor's Management Plan (1989). The plan ultimately specified that sergeants were to complete two years of college education, while lieutenants were expected to complete three years of college education, and captains were expected to complete a four-year bachelor's degree. After various challenges to the policy, the New York City Police Department (NYPD) was successful in implementing much of the original policy recommendations in 1988. The NYPD currently has a 60 college credit entry level requirement. The New York City Police Department (2010) website indicated the educational requirement for the position of police sergeant stands at 64 college credits and progresses to 96 college credits for promotion to police lieutenant. The educational requirement for promotion to the rank of police captain is currently a four-year bachelor's degree. The NYPD website further indicated that many who aspire to ascend the ranks pursue advanced degrees, as the current standards are simply the minimum for eligibility. Such higher education requirements for promotion have even been supported by some of the critics of the position that higher education hiring standards are needed for entry level law enforcement. Baro and Burlingame (1999), although critical of the need for higher education standards at the entry level, noted the "lack of higher education among command staff members and in specialized units is problematic. . ." (p. 55). They postulated that a fuller integration of the training conducted by police and law enforcement-related agencies with the education associated with higher education could help in addressing the problem.

There are nearly 18,000 law enforcement agencies in the United States with more than 12,000 being local police departments. In a survey of 3,000 police departments

conducted by Hickman and Reaves in 2003, 98% of the police departments surveyed reported having a high school diploma or GED educational requirement. Of the 3,000 police departments surveyed, 18% reported having "some type" of college requirement (Hickman & Reaves, 2004). Interestingly, despite the very low number of agencies with higher education requirements, a considerable number of officers have been found to have completed at least some college. As referenced earlier, Carter and Sapp (1990) revealed that in 1988, 22.6% of officers had completed an undergraduate (four-year) degree; while 42.6% had at least "some college" through the completion of a two-year degree; and 65.2% of active law enforcement officers reported having completed some level of formal college education.

In 2010, Diana Bruns conducted a study to understand why only 1% of the local police departments in the United States require a four-year college degree. The study involved the identification of 37 local police agencies ($N = 37$) known to have a four-year degree requirement for entry level applicants. Of the 37 agencies surveyed, 36 agencies responded (97% response rate). The survey questionnaire was constructed presenting 30 questions, both open-ended and closed-ended, in a mixed method design (Bruns, 2010).

According to Bruns (2010), two primary questions were the focus of the study and both were directed to the police chiefs of departments with mandatory four-year degree requirements: (1) Why do their departments have a mandatory degree requirement? and (2) Why do so few departments actually require a degree? This study served primarily as an exploratory study, providing descriptive statistics regarding the mean department size and jurisdiction population among other demographic data of the agencies surveyed. The

qualitative component centered on the perception of the police chiefs in the respective agencies. Collectively, several consistent themes evolved from the study. The police chiefs indicated the college degree requirement was part of their organizational culture, carried with it knowledge and expertise, mirrored the education level of the community served, was supported by a belief in excellence and quality in performance, promoted professionalism, and resulted in officers who tended to be more mature and possess stronger goal-reaching abilities (Bruns, 2010).

As with much of the research related to higher education in law enforcement and as referenced by Bruns (2010), this study was exploratory in nature and should serve as a step toward more refined research on the topic. Of the qualitative research on higher education in law enforcement, this was one of the most contemporary studies. It explored an area not yet researched in attempting to answer the question regarding why only 1% of the local police departments in the United States have a four-year college degree requirement. According to Bruns (2010), police chiefs believed so few departments have the degree requirement due to such factors as a concern they will have a decrease in the applicant pool, the fact that education is under-valued in policing, concern that many current police leaders do not have degrees, concern of losing officers to higher paying jobs in other fields, eventual officer dissatisfaction with the position, and the belief that the traits needed for effective policing cannot be learned at a college. From the vision and efforts of August Vollmer in the early 1900s through the continuing efforts of researchers like Diana Bruns in 2010, history demonstrates that progress is slow, yet progress is being made. Efforts to study the relationship between higher education and

law enforcement will likely continue for another hundred years in an effort to truly

determine the value of higher education within the multi-dimensional law enforcement

arena. By reviewing the historical developments, including the desire for enhanced and

formalized training from the early 1900s to the present day and continued emphasis on

higher education, greater understanding can be gained when exploring the more specific

sections which follow in this literature review.

The Distinction between Vocational Training and Higher Education

Education is distinguished from training in most of the authoritative literature.

While training is often associated with pedagogical approaches focusing on "how" a task

is performed, education is most often associated with andragogical approaches focusing

on "why" a particular task is performed (Roberg et al., 2002). Andragogy, as discussed

by Knowles (1970), is the science and art of teaching adults, while in a comparative

respect, pedagogy is often associated with the science of teaching children. According to

Hess and Orthmann (2012), the distinction between training and education centers on the

notion that training is vocational in nature, while education is a more academic endeavor.

This distinction carries a significant degree of importance, as according to Leavitt (1989),

vocational students are less likely to experience attitude changes with regard to

authoritarianism, civil rights, and political views than students in more academic-

oriented, educational studies. This in no way diminishes the importance of the need for

effective training in law enforcement, as "the training function is a critical and significant

function of any agency that is concerned about quality, productivity, liability, and

morale" (Scott, 2005, p. 40). While training is a vital aspect of law enforcement, the

emphasis on higher education and the positive outcomes desired from law enforcement officers tend to center on attitudinal changes not found as a result of basic training. It is recognized that knowledge and skills are readily improved through effective training, while attitudes are clearly the most difficult to change through traditional vocational training methods (Hess et al., 2012).

Shemock (1992) also formed a distinction between training and education. Along with Goldstein (1977), Shemock (1992) felt that the curriculum of the LEEP years was not educational in nature. Rather, these authors felt LEEP-based college courses were training- focused and disregarded the theory-based curriculum necessary to provide greater understanding of human nature. These researchers believed the educational curriculum should have been based on the social sciences or liberal arts related areas.

Universal Standards for Law Enforcement

The Commission on Accreditation for Law Enforcement Agencies, created in 1979 and most commonly referred to as CALEA, has established more than 460 standards for law enforcement in an effort to elevate the level of professionalism in law enforcement throughout the country. The process of accreditation involves a significant divergence from the closed, isolationist method of operation so common to traditional law enforcement. Throughout history, individual police departments tended to operate in isolation, thereby insulated from outside involvement, interference, or scrutiny (Kappeler et al., 2005). Under accreditation, an individual agency agrees to come into compliance with pre-established standards through appropriate policy development and implementation as well as consistent and strict adherence to the standards. Most notably,

the agency agrees to a detailed, formal inspection by CALEA assessors every three years.

The assessors review existing department policy as well as various forms of compliance

proofs which include but are not limited to reports, interviews with officers, and

memoranda. The focus of the CALEA inspection is whether the agency has consistently

complied with each of the standards. Within the more than 460 standards established by

CALEA for police departments pursuing national accreditation, the training standard

provides significant insight regarding the current emphasis on training and education.

The commentary associated with the respective standard, CALEA Standard 33, states in

part:

> Training has often been cited as one of the most important responsibilities
>
> in any law enforcement agency. Training serves three broad purposes.
>
> First, well-trained officers are generally better prepared to act decisively
>
> and correctly in a broad spectrum of situations. Second, training results in
>
> greater productivity and effectiveness. Third, training fosters cooperation
>
> and unity of purpose. Officers who have received [higher] education have
>
> a better opportunity to gain a more thorough understanding of society, to
>
> communicate more efficiently with citizens, and to engage in exploration
>
> of new ideas and concepts (p. 33-1).

The commentary related to the standard further emphasizes the necessity of education

levels for officers to rise consistently with the ever-increasing complexity and

sophistication of our society (CALEA, 2009). The CALEA accreditation process

remains a voluntary process in which most police departments currently choose not to

participate. CALEA recently expanded its program offerings by allowing police departments to first complete a 112-standard recognition program at the state level before advancing to the national accreditation process which requires adherence to at least an additional 348 standards beyond the Recognition Program. The CALEA Recognition Program includes Standard 33, Training and Career Development, among the 112 core requirements.

Beyond the CALEA accreditation program, other efforts have been made on a state and local level to impose standards related to education and training for law enforcement. In 1977, the State of Minnesota established a benchmark for the rest of the nation by forming the Peace Officers Standard and Training (POST) Board. The POST board instituted a state licensing process which included a pre-hire, education requirement for police officers, clinical (academy) training, and a licensing examination. The educational standard included a two-year degree requirement for entry into law enforcement along with a continuing education requirement of 48 hours within the three-year licensing period.

Professor Michael G. Breci of the Metropolitan State University, School of Law Enforcement, in Minnesota, authored a 1994 article entitled, "Higher Education for Law Enforcement," published in the *FBI Law Enforcement Bulletin*. According to Breci (1994), a significant aspect of the POST standards is the continuing education requirement, as the individual bears the burden of attending professional development training or risks not having his or her license to serve as a law enforcement officer in the State of Minnesota renewed. During his research of the "Minnesota Model" in 1990,

Breci distributed a survey to 1,500 randomly selected ($N = 1,500$), licensed Minnesota police officers and received responses from 915 (61% response rate). The officers were asked questions designed to determine how each officer believed the POST Board's educational requirement affected him or her. According to Breci (1994), the respondents indicated that through their higher educational experience, they were more well-rounded, kept more current, had improved their ability to communicate with the public, prepared for advancement, and had developed needed computer skills.

Breci's research continued as he elicited responses regarding the officers' perspectives related to increasing the licensing standard to a four-year degree requirement. According to Breci (1994), a majority of the respondents expressed that a four-year degree would likely enhance performance on the job, would improve professionalism, and would ultimately result in higher pay. Of the 915 officers surveyed, almost 30% already possessed a four-year degree, an additional 23% indicated they planned to complete a four-year degree within the five years following the survey, and 56% of the remaining group expressed their plans to attend some college courses.

The research conducted by Breci involved distributing a survey to participants in 1990 who were actively working under a degree requirement initiated in 1977. Given the status of the respondents, the results must be kept in perspective. The results were likely influenced by a potentially more favorable bias toward formal education by those who had attained college degrees. Similarly, their views of the influence college education has on performance in law enforcement would likely be more favorable as well. Furthermore, of the 61% returned surveys, it is likely that officers who completed higher

levels of education would participate in the study, thereby influencing the results.

Appropriate efforts should have been undertaken to increase the number of surveys

returned to achieve a more representative reflection of the perceptions of Minnesota

police officers rather than just the 61% who were inclined to return the survey. Other

than this concern, this qualitative study provides a positive view of higher education in

law enforcement.

While there is an abundance of qualitative research available regarding higher

education and law enforcement in general, there is currently a dearth of quantitative

studies which measure the optimal amount of education for law enforcement. Yet, for

decades, a presumptive correlation has existed relating law enforcement professionalism

with high educational attainment. Such a presumption anteceded the aforementioned

effort by the National Advisory Commission on Criminal Justice Standards and Goals in

1973 to set more aggressive higher education standards (Parker, 1992). The conventional

thought has remained that college has the positive effect of maturing individuals while

providing them with a broader base of experience.

The Law Related to Higher Education Requirements in Law Enforcement

The imposition of minimum, higher education standards for employment purposes

must pass legal scrutiny as well. Vigilance in remaining educated and informed

regarding the court's ever-changing interpretation of the Title VII requirements is an

essential aspect of leading and managing an organization in today's litigious

environment. Congress, in the passage of the Civil Rights Act of 1964, the Equal

Employment Opportunity Act of 1972, and the Civil Rights Act of 1991, made it clear

that it intended to provide legal guidance to private and public sector employers and the courts regarding unlawful discrimination in the workplace. Under the aforementioned acts of law, the imposition of higher education as a condition of employment must not have a disparate impact on a minority group in a hiring or promotional process (Thibault, Lynch, & McBride, 2004).

The "disparate impact doctrine" is a unique provision of law based on the United States Supreme Court's ruling that Title VII not only prohibits "express discrimination (disparate treatment) but also prohibits neutral employment practices that have an effect of discriminating against a particular group protected by the act" (Brooks, 2001, p. 26). The "effect of" language in the aforementioned quote refers to the prevailing legal principle which establishes that a discriminatory practice does not have to be intentional to be considered discrimination   nonetheless. This poses a difficult challenge for employers and has been used by plaintiffs throughout the country to challenge hiring and labor standards or practices on the basis that a particular standard or practice has a discriminatory, disparate, and adverse impact on a particular group based on race, color, sex, national origin, or religion.

Since the provisions of Title VII of the Civil Rights Act of 1964 originally applied only to private employers, the Equal Employment Opportunity Act of 1972 was passed eight years later with provisions extending the Title VII requirements to state and local governments as well (Cayer, 2004). Establishing a minimum education level as a condition of eligibility for employment or promotion would be viewed as "unintentional" discrimination if the employment condition was found to have a disparate impact on a

qualified minority group of candidates. Yet, under the law, it is considered discrimination unless certain legal conditions are met.

The landmark United States Supreme Court case of *Griggs v. Duke Power Company*, 401 U.S. 424 (1971), established a precedent and the basic criteria for the assessment of unintentional employment practices which have had a disparate impact on a protected group. The court ruled that "employment tests and practices that exclude a disproportionate number of non-Whites and women may be discriminatory regardless of whether there was an intent by an employer to discriminate" (Thibault et al., 2004, p. 306). Both hiring and labor practices can be assessed under the disparate impact doctrine as established in the *Griggs* case. The actual case involved an employment standard within the Duke Power Company which required applicants for promotion to have a high school diploma and score sufficiently on two standardized written examinations. "Griggs, a black employee with the Duke Power Company, had been denied a supervisory position on the grounds that he did not possess a high school diploma, a credential the company required for such a position" (Swanson et al., 2005, p. 364).

The requirements were found to disproportionately exclude Black candidates, so the court had to assess whether or not the practice was discriminatory. The attorney for Griggs argued that the requirement was discriminatory, as far fewer Blacks had high school diplomas than Whites (Swanson et al. 2005, p. 365). The *Griggs* court, understanding that an employment standard can be a necessity and a fundamental requirement in performing a job, established what is referred to as the "business necessity" exception for an employment standard which has an unintentional adverse and

disparate impact on a particular group of people. In making its assessment, the United

States Supreme Court in *Griggs v. Duke Power Company* (1971), indicated that Congress

intended to prohibit artificial and arbitrary barriers which ". . . operate invidiously to

discriminate on the basis of racial or other impermissible classification." The origin of the

disparate impact assessment came from the *Griggs* case and has evolved through the

Equal Opportunity in Employment Act of 1972 and its application to state and local

governments. Public sector hiring and labor practices have faced numerous challenges

resulting in considerable changes throughout the years since the *Griggs* case.

Upon the acknowledgment by the court that the plaintiff has established a *prima*

facie case of employment discrimination under the disparate impact doctrine, the burden

shifts to the employer. A prima facie (evident at first glance) case may be demonstrated

in a disparate impact claim if the hiring rate for any minority group is less than 80% of

the hiring rate of the majority group (Hess et al., 2012). "If a situation of disparate

impact exists, the employer must demonstrate that such tests and practices relate to a

business necessity and the demands of the position" (Thibault et al., 2004, p. 306). The

business necessity requirement was established by the court to assert that the hiring or

labor standard in question must be a legitimate job-related requirement of the position.

As part of the United States Supreme Court decision in the *Griggs* case, the court found

that the requirement of a high school diploma for a promotion to supervisor within that

particular laborer's position was discriminatory toward Black candidates.

After evidence by Griggs that the high school diploma requirement had a

statistically significant disparate impact on Black candidates as compared to White

candidates, the Duke Power Company was forced to present proof that a high school diploma was necessary for the supervisory position. In light of Grigg's exceptional employment record and the Duke Power Company's inability to show a direct correlation between having a high school diploma and the employee's ability to perform the job, the standard was found to be discriminatory. In the face of statistical evidence that fewer Black candidates had high school diplomas than whites, the company's imposition of what would seem like a reasonable and respectable employment standard for a supervisory position actually was determined to be a violation of Title VII of the Civil Rights Act of 1964.

Educational requirements are some of the most notable standards which contemporary managers attempt to impose on applicants for employment. According to Mahony and Prenzler (1996), studies indicate that the disadvantages minority candidates experience due to the imposition of educational standards may actually be outweighed by the positive influence experienced as a result of higher educated staff in the workplace. By most accounts in the literature, raising educational standards is a respectable and expected approach to improving an organization and the field of law enforcement as a whole, but if there is no direct correlation established between the level of education required and the job to be performed, the requirement may be deemed discriminatory. In the absence of the requisite, job-related business necessity, an excluded employee will win a challenge if the standard is shown to have a disparate and adverse impact on a protected class. Considering the legal implications, many chief executives and personnel managers have avoided the potential legal dilemma by not imposing the requirement of

higher education as a condition of eligibility for employment in law enforcement. "Disparate impact claims are complex (and expensive) because they require the use of experts and involve sophisticated statistical methods" (Runkill, 2007). Chief executives clearly have a responsibility to act, not only without discriminatory intent, but also with an eye to avoiding unintentional discriminatory practices.

The process of assessing an employment standard or practice is complicated by the additional requirement that, even if an employment practice can be shown to be required as job-related and necessary, it may still be found as discriminatory. If the plaintiff can demonstrate that a less discriminatory, yet effective, alternative is available to the employer, then the current practice will be ruled improper and require omission or modification. In the Civil Rights Act of 1991, the revisions to Title VII included 42 U.S.C. §2000e-1(B)iii(II), which is the requirement that such alternative practices or assessments be utilized. The most notable instances of the application of the disparate impact doctrine have come in cases that never made their way through the courts for a final determination.

The tremendous expense of defending against a claim of disparate impact along with the considerable complexities of the legal issues has led to many different "consent decrees" which involve a legal agreement between the plaintiff(s) and the defendant(s). The settlements are sanctioned by the court and are legally binding, yet are not an actual precedent-setting ruling by the court. Some notable agencies and jurisdictions which have fallen under controversial consent decrees include the New Jersey State Police and New Jersey Department of Personnel (New Jersey Civil Service Commission), as well as

the Civil Service Commissions in Nassau County and Suffolk County, New York. In each of the aforementioned cases, a disparate impact claim was made in Federal District Court with the full power of the United States Justice Department, Civil Rights Division, behind the plaintiffs' claims. With the full force and seemingly endless resources of the Civil Rights Division of the United States Department of Justice behind the challenges, each of the aforementioned defendants agreed to forego attempts to defend their employment practices and agreed to many of the demands made by the plaintiffs. This contemporary controversial issue surrounding the current application of the disparate impact doctrine has in part contributed, via the fear of litigation, to a lack of universal imposition of minimum education standards for law enforcement.

As a result of the expensive legal challenges, all of the aforementioned jurisdictions agreed to change their employment practices rather than defend the practices. The decision to forego the employment practices was not the decision of the court based on established law, but actually came as a result of settlements to disparate impact lawsuits to avoid costly continued litigation. Police agencies currently operate in a public service environment in which ". . . personnel activities are frequently constrained not only by equal opportunity law but also by civil service systems, local government personnel departments, and state law and regulations" (Cordner, Scarborough & Sheehan, 2004, p. 79). Making the bold decision to proceed with the implementation of a higher educational requirement within an individual police department may prove to be a costly decision in today's litigious work environment.

The landmark case in support of higher education requirements for employment

in law enforcement came from the case of *Davis v. City of Dallas*, 777 F.2d 205 (5th Cir.

1985). As the case name indicates, the legal action involved the Dallas Police

Department in Texas. More specifically, the legal challenge was based on the agency's

1974 use of an education requirement to eliminate a candidate who was seeking

employment with the police department. The City of Dallas imposed a 45-semester hour,

college credit requirement with at least a "C" average (Hess et al., 2012). Each candidate

was also required to have a suitable background which included the candidate "not have

history of recent or excessive marijuana use, and must not have been convicted of more

than three hazardous traffic violations within the preceding 12 months" (Carter et al.,

1988, p. 205).

The applicant, Brenda Davis, originally filed suit in Texas, but the case

progressed through the federal court system until the United States Supreme Court

declined application for the matter to be appealed to the nation's highest court. The

United States Supreme Court let stand the lower-court decision which determined that the

pre-employment standards established by the City of Dallas for a law enforcement

position within the city police department were a bona fide occupational qualification

(BFOQ). According to the court, the public safety role of a police officer justified the

educational standard (Young, 1987).

Roy Roberg and Scott Bonn (2004) authored an article entitled, "Higher

Education and Policing: Where Are We Now" for *Policing: An International Journal of

Police Strategies and Management.* They explored the issue of higher education as a

bona fide occupational qualification (BFOQ) and stated:

One of the primary reasons departments had not embraced higher

educational requirements more vigorously was the dilemma of not being

able to validate such a requirement for the job, thus opening the

department to a court challenge. Establishing higher educational

requirements as a bona fide occupational qualification (BFOQ) for police

work could be an important step in facilitating the use of advanced

education as a minimum entry-level selection criterion. (p. 479)

The rationale as presented by Roberg et al. (2004) parallels the basic reasoning

presented nearly twenty-five years earlier in the New Jersey Civil Service Commission's

order dated July 17, 1979, which effectively outlawed the use of higher educational

standards for local municipal police departments falling under the purview of the

Commission. In 1979, the New Jersey Civil Service Commission conducted a public

hearing to solicit testimony regarding the establishment of statewide standards for

eligibility for admission to the entry level law enforcement examination (New Jersey

Civil Service Commission, 1979). Although a majority of the representatives favored at

least a one-year higher education requirement for eligibility in order to be admitted to the

entry level examination, the New Jersey Civil Service Commission decided against acting

on the recommendations. The 1979 Commission order stated, "In the absence of a clear

showing that college credit or degree requirements are valid, the Commission orders that

the current requirement of a high school degree or its equivalent be continued as a

statewide standard for admission to Civil Service Police Officer examinations" (p. 4).

Effectively, the Commission was looking for definitive empirical evidence indicating

higher education is a valid bona fide occupational qualification for a municipal police

Higher Education at the Entry Level

According to Roberg et al. (2004), approximately one quarter of the population in the United States possesses at least a bachelor's degree. They further express the opinion that those police departments which have not raised entry level educational requirements have effectively failed to live up to the early tradition of hiring people with an above-average education to carry out police functions. Such an "early tradition" as referenced by Roberg et al. (2004), reaches back to the implementation of high school diploma requirements and extends through to the latest standards requiring a bachelor's degree at the entry level.

The desire to promote formal, higher education standards for law enforcement has been reinforced through the years as posited by Sherman (1978), who believed police departments should focus on recruiting educated officers. This belief was further reinforced in recent years by Fyfe and Kane (2006), who conducted extensive research of the New York City Police Department. Fyfe et al. (2006) found the best way to prevent misconduct within the law enforcement ranks is to recruit and ultimately hire candidates with both positive backgrounds and education credentials. Such research emphasizes the need to raise educational standards at the entry level. Research outside the context of law enforcement provides similar insight. A study conducted in 1969 reveals that college has the following impact on students: an overall increase in intellectual aptitude, heightened ability to think critically as well as independently, an increase in factual knowledge, and a higher level of open-mindedness with less authoritarianism and prejudice (Scott, 1986). Furthermore, college exposes students to new ideas while enhancing their

communications skills (Tonry, 1997). The positive impact on students attributed to their

college experience bodes well for enhanced performance and the diminished likelihood

of misconduct in law enforcement. The most notable attributes cited by Scott (1986)

which relate to improved police performance in the field are the potential for a lessened

degree of prejudice, a lessened degree of authoritarianism exercised, and a higher level of

open-mindedness.

The college curriculum may not be the sole or primary reason for differing

behavior as indicated by the research. It is not only the manner in which the knowledge

and skills are delivered, research also indicates that it is the college experience which is

said to contribute to substantive changes as well. Through the years of research, several

of the positive attributes found in law enforcement candidates who have graduated

college prior to entering the field have been attributed to the college experience itself.

These candidates tend to be more diverse than before their college experience, and the

intellectual ability of the college graduates is said to have improved since 1980 (Boylan,

2002). The empirical evidence indicates higher education, on average, significantly

increases the intellectual disposition, level of knowledge, and cognitive powers of college

students (Bowen, 1996).

College also provides the opportunity for students to regularly interact with fellow

students from differing cultures and ethnic backgrounds, which has been shown to have a

statistically significant positive impact on critical-thinking skills (Pascarella, Palmer,

Moye, & Pierson, 2001). According to Terenzini, Cabrera, Colbeck, Bjorklund, and

Parente (2001), greater diversity in a college classroom tends to increase the cognitive

gains of the students in the class. The cognitive gains with respect to problem solving and skill development of students were reflective of the level of diversity of the particular classroom. The measured gains moved from low, moderate, to high as the level of diversity increased, respectively. Pascarella and Terenzini (1991) emphasized that the changes experienced in students was not based on the potentially confounding variable of differing characteristics of students who are afforded the opportunity to attend college nor the potentially confounding variable of late adolescent maturation, but more on the college experience itself. Such research and conclusions support the proposition that the college experience extends beyond the realm of basic skill development and may have a positive impact due to factors outside the direct curriculum. Even with these findings, it is interesting to note that according to Hickman et al. (2006), less than 1% of the police departments in the United States require a four-year degree for entry level employment.

Carlan (2007) conducted a study examining the value of a criminal justice degree from the perspective of police officers. The study involved 299 police officers ($N = 299$) who had completed a degree in criminal justice. The study revealed that police officers held positive attitudes toward the criminal justice degree's value as it related to being prepared for employment in law enforcement.

In 2008, Susan Hilal and Timothy Erickson of the Metropolitan State University, St. Paul, Minnesota, authored an article entitled, "The Minnesota Police Education Requirement," published in the *FBI Law Enforcement Bulletin.* The study was based on the earlier work of Michael Breci (1994). Of the 9,386 officers in Minnesota (N =

9,386), this qualitative study included a simple random sample of 1,099 active Minnesota

police officers ($n = 1,099$). A thirty question survey was mailed to each of the selected

officers and 627 officers responded (57% response rate). Based on the descriptive

statistics obtained, "Minnesota police officers appeared to be more educated than the

general population in the state" (Hilal et al., 2008). The data revealed that 34.7% of

active officers possessed a four-year degree, while 27.4% of Minnesota residents had at

least the same level of education.

In comparison to Breci (1994), there was an increase in officers who felt that

higher levels of education were needed for supervisory positions, but a notable decrease

in those who indicated a four-year degree requirement should be imposed as a hiring

standard. While 40.6% of officers supported a four-year degree hiring requirement in the

study conducted by Breci (1994), only 30.8% of the officers supported the hiring

stipulation in 2008 as reported by Hilal and Erickson. Hilal et al. (2008) clarified that

officers with more years of service were less likely to favor the four-year degree

requirement.

Professionalism

The emphasis on the potential benefits of higher education for law enforcement

officers commonly enters the discussion of law enforcement professionalism as well.

According to some authors, the concept of professionalism in law enforcement has

tended "to mean a combination of managerial efficiency, technological sophistication,

and an emphasis on crime-fighting" (Peak & Glensor, 2004, p. 10). This notion is

inconsistent with the accepted definitions of a profession. According to Baro (1999),

policing falls short of a profession, which is an opinion supported by the U.S. Census Bureau categorization of police officers as "service providers" and not professionals. Furthermore, the U.S. Department of Education classifies policing simply as a craft with the associated training classified as trade and industrial programs (Calhoun and Finch, 1982). A distinction is often drawn between police and recognized professions in that the professions are self-regulating, licensed, and based on higher education standards that the police field resists or fails to universally embrace (Kennard, 1995).

Despite literature to the contrary, there are many examples of authors who support the assumption that policing is a profession. In such instances, variables have been identified in a manner to justify their position. The differing variables which depart from the recognized norms for a profession include: standards for training, certification, specialization, and limited membership (Azzaretto, 1992; and Bumgarner, 2002). This differs from Cyril Houle (1980) who theorized that for an occupation to be a profession, the occupation should, in part, have a central mission, mastery of theoretical knowledge, formal training, credentialing, legal reinforcement, and regulation with penalties. Currently, law enforcement falls short on most lists of characteristics necessary to be a profession, yet the move toward universal higher education standards would certainly be a step toward such a classification.

The Influence of Higher Education on Behavior in Law Enforcement

Common variables that tend to hinder law enforcement's progress toward professional status are misconduct, excessive force, and associated unethical behavior. Many of the law enforcement-related studies concerning higher education tend to focus

on negative behaviors and their often hypothesized inverse relationship. Throughout

decades of research, some consistency has been found with respect to college education

and police behavior. According to Benson (1993), non-college educated officers are

inclined to be aggressive, are less imaginative and innovative, and tend to prefer routine

and supervision. Carter et al. (1989), assert that officers with college degrees are not as

likely to be the subject of citizen complaints as compared to less-educated officers.

Wilson (1999) conducted a study of several police departments in California, and he

found that officers who completed bachelor's degrees received fewer complaints against

them than officers who did not have a college degree.

In 1992, Stanley Shemock reported on his study entitled, "The Effects of College

Education on Professional Attitudes Among Police," *Journal of Criminal Justice

Education*. Shemock's 1992 study involved an analysis of police officer perceptions and

professional attitudes. He produced and distributed a survey to 177 police officers ($N =$

177) from both New York State and the New England region. As a result of Shemock's

1992 research, he found that higher education had a positive impact on law enforcement

as officers who completed a degree were "less likely to be authoritarian, cynical,

prejudiced, and intolerant." (p. 73).

In a landmark study of 1,600 New York City police officers, Cohen and Chaiken

(1972) found that when education is introduced into the regression equation for civilian

complaints, it emerged as the most powerful predictor of civilian complaints. They found

inverse relationships existed for officers with some college (in comparison to no college)

and citizen complaints, which included allegations of abuse, inappropriate demeanor,

ethnic slurs, and unnecessary use of force.

Scott Cunningham (2003) of the International Association of Chiefs of Police (IACP) spoke at the 110th Annual IACP Conference in Philadelphia, Pennsylvania. Cunningham (2003) revealed the results of a study conducted utilizing data retrieved from the Florida Justice Standards Training Commission, which oversees all law enforcement in the State of Florida. In 2002, Florida had more than 43,000 law enforcement officers ($N = 43,000$). The study produced descriptive statistics which revealed that officers possessing only a high school diploma accounted for a disproportionately high number of the discipline cases throughout the state. The variables compared in this study are level of education and incidence of disciplinary action.

In the state of Florida, the minimum education requirement to be certified as a police officer is a high school diploma. The study analyzed disciplinary action cases throughout the state for the five-year period of 1997 to 2002. The descriptive data revealed that the higher the education level, the lower the incidence of disciplinary action cases. Of the disciplinary cases throughout the state during the five year period, 75% of disciplinary action cases were attributed to the 58% of officers who possessed only a high school diploma. The 16% of officers who possessed a two-year degree accounted for 12% of the disciplinary cases, while the 24% of officers who completed a bachelor's degree accounted for only 11% of the disciplinary cases. This study and the production of the aforementioned descriptive data did not reveal causation, but did provide an exploratory foundation for further research in the State of Florida. Cunningham (2003) stated that he chose to analyze data from the State of Florida due to the relative ease in

obtaining consistent data through the Florida Justice and Standards Training

Commission. This was critical to the study as, at the time, many other states had

inconsistent data collection or tended to make the data acquisition process too difficult

for researchers to obtain.

Fyfe et al. (2006) examined the New York City Police Department (NYPD). This

study included data regarding 1,543 officers ($N = 1,543$) who had been terminated from

1975 to 1996 for misconduct. According to Fyfe et al. (2006):

> The study uses confidential NYPD files as its major data sources. It
>
> employs bivariate techniques to test 37 hypotheses and sub-hypotheses
>
> suggested by the literature, two expert advisory committees, and several
>
> focus groups of NYPD personnel. In addition, the research employed
>
> appropriate multivariate techniques (Principal Component Analysis;
>
> Logistic Regression Analysis) which, with some exceptions, generally
>
> supported bivariate findings. (p. 3)

This extensive study revealed that officers who have not at least completed a two-

year degree were more likely to be terminated from employment than officers who

completed at least a two-year degree. This study utilized variables related to the officers'

past history, including: officers' poor employment history, poor military record (if

applicable), previous arrest history, and traffic violations. This study further revealed

that these factors also contributed to an officer's being more likely to be terminated when

compared to other officers who did not have such negative issues in their past. At the

time of this study, it was considered by the authors to be the most comprehensive study

of its type, as it involved the most variables being assessed. Furthermore, in addition to bivariate analysis to test 37 hypotheses and the use of two focus groups, this study also involved principal component analyses and logistic regression analysis thereby contributing to the call for much needed quantitative research.

In 2007, researchers Eugene Paoline and William Terrill published an article entitled, "Police Education, Experience, and the Use of Force," in *Criminal Justice and Behavior*, based on their quantitative analysis of observational data collected during 3,356 officer-suspect encounters ($N = 3,356$) in St. Petersburg, Florida and Indianapolis, Indiana. The data were collected as part of the Project on Policing Neighborhoods (POPN) during the period of 1996-1997 (Paoline, Myers & Worden, 2000). The POPN involved extensive data collection funded by the United States Department of Justice ten years prior to the 2010 quantitative analyses of the data by Paoline and Terrill. During the data collection, the systematic social observation technique (SSO) was utilized and each of the observers had prior training in SSO (Mastrofski, Parks, Reiss, Worden, Delong, & Snipes, 1998). The observational data were collected through observer notes on encounters between police and suspects in the field. The notes were transcribed after each day of observation and entered in a SPSS data set (Ryberg et al., 2010). They posited that beyond the consideration of higher education, experience is a primary factor in determining police performance. They recognized that prior studies had not included analysis of the potentially compounding impact of combining experience with higher education to predict the use of force or coercion by police officers.

This multivariate study focused on 3,356 encounters ($N = 3,356$) between police officers and citizens who were classified as suspects. The observational data and

respective coding utilized the basic descriptors--wrongdoers, peace disturbers, or persons about whom complaints were received--to classify a citizen as a "suspect" (Paoline et al., 2007). "Verbal force" is defined in the study as verbal commands or threats, while "force" is defined as acts that threaten or inflict physical harm on citizens. These researchers were more concerned with the coercion used by officers during encounters than the use of actual physical force. The dependent variable, officer use of coercion, was operationalized as either no use of force, verbal force, or use of physical force, as defined above. Only the highest level of force used during the citizen encounter was coded as force in the SSPS data set, thereby not providing for an analysis of the progression of force. The analysis disregarded whether an officer immediately proceeded to the highest level of force coded or worked through a progression from low to high during the encounter.

The basis of this study, as positioned in the educational debate, centers on the counter-argument that it is experience which serves as the primary factor impacting police use of coercion/force and not necessarily education as other studies have posited (Fyfe et al., 2006; Carter et al., 1992; Shernock, 1992; Sapp et al., 1989; and Cascio, 1977). As such, the primary independent variables of interest for this study are education and experience, while the dependent variable is the level of coercion utilized in the officer-suspect encounters. According to Bittner (1970), the use of coercion is one of the central features of the police role in our society.

In this research, appropriate steps were taken to control for variables which have been identified in previous research as having an impact on an officer's use of force.

Control variables were utilized in the model and addressed in the reporting. Hudzik (1978) describes problems in measuring and controlling component and extraneous variables in the research design of many studies attempting to relate higher education to police. These researchers elected to use a main effects model where the effect of education is measured separately from the effect of experience. A model was subsequently utilized to determine the interaction effect of education and experience on the level of coercion applied by officers. These researchers recognized the limitations of linear regression techniques when analyzing an ordinal ranked dependent measure as distinguished by McKelvey and Zavoina (1975), and therefore elected to utilize the ordered probit as recommended by Jargoura (1993).

In the main effects model, both education and experience were found to be statistically significant ($p < .05$). This multivariate analysis revealed that officers with "some college" to a "four-year degree" were less likely to use higher levels of force than officers with no college ($b = -.166$ and $b = -.273$, respectfully; $p < .05$). Similarly, officers with a higher level of experience were found to be less likely to use higher levels of force as well ($b = -.014, p < .05$). Interestingly, the interaction effect model revealed that the joint effect of experience and education was not statistically significant. Therefore, while the level of education and the years of experience of an officer, independently, are likely to have an impact on the level of coercion used by an officer, there was no compounding effect between the two independent variables. This research distinguishes that both higher education and years of experience matter with respect to

the use of force in law enforcement (Paoline et al., 2007).

In 2010, researchers Jason Ryberg and William Terrill published an article

entitled, "The Effect of Higher Education on Police Behavior," in *Police Quarterly*,

based on their quantitative analysis of observational data collected as part of the Project

on Policing Neighborhoods (POPN). As with Paoline et al. (2007), the data analyzed

were derived from 3,356 officer-suspect encounters ($N = 3,356$) observed during the

period of 1996 -1997 (Paoline et al., 2000).

Ryberg et al. (2010) recognized the conspicuous absence of methodologically

sound research regarding higher education and law enforcement, both qualitative and

quantitative. This prompted their use of the POPN data to conduct multivariate analyses

using binary logistic regression (McKelvey et al., 1975) to assess the dichotomous

outcome (dependent) variables of arrest/no arrest, search/no search, and use of force/no

force. The primary independent variable is the level of higher education. The

researchers hypothesized that the higher level of education of an officer, the greater the

probability of a reduction in the number of instances an officer-suspect encounter would

result in an arrest, search, or use of force. Ryberg et al. (2010) established three

groupings of control variables and used a stepwise approach for the regression analysis.

Control variables included measures of officer experience, gender, and race in Group 1;

suspect characteristics including, age, race, gender, and socioeconomic status in Group 2;

and characteristics of the setting including, number of officers on scene, number of

citizens on scene, whether the officer initiated the encounter with the suspect, and in

which city the encounter occurred (St. Petersburg or Indianapolis).

The analyses conducted by Ryberg et al. (2010) provided much needed methodologically sound, quantitative research of multiple variables as they relate to higher education in law enforcement. This research along with the research conducted in 2007 by Paoline and Terrill is a necessary step in the right direction and should serve as an example for continued inquiry on a topic often the subject of opinion but not supported by validated research. As noted by Ryberg et al. (2010), many researchers have theorized regarding the value of higher education in law enforcement even if only to justify the results of their studies without actual hypothesis testing. They further indicate that "previous examinations of the relationship between higher education and police behavior have focused on a single outcome, thereby impeding the comparability of education's potentially differential impact on a variety of officer behavioral outcomes" (p. 109). This research is distinctly different, as multivariate analyses are utilized to evaluate the influence of each dependent variable in the regression equation. It is also worthy of note that an initial analysis of the dependent variables (arrest, search, use of force) at the bivariate level revealed no relationship between level of education and arrest nor any relationship between level of education and search. Yet, a statistically significant ($p < .001$) relationship was found to exist at the bivariate level with respect to officer level of education and use of force (Ryberg et al., 2010).

Beyond the bivariate level and through the use of binary logistic regression analysis, these researchers found that officer level of education did not have a statistically

significant influence over the probability that an arrest would take place nor a statistically

significant influence over the probability a search would be conducted. In other words,

whether or not an officer completes a 4-year degree is not a valid predictor of an arrest

and/or search in an officer-suspect encounter. Yet, most notably, Ryberg and Terrill

found an officer's level of education is a statistically significant ($p < .001$) predictor of

the probability an officer will use force in an officer-suspect encounter.

As with the research of Paoline et al. (2007), the research conducted by Ryberg et

al. (2010) exemplifies contemporary research utilizing the most sophisticated and

statistically appropriate quantitative methods. Historically, the study of higher education

and police performance has been founded on methodologically questionable grounds

employing small sample sizes, limited control measures, ambiguously operationalized

variables, and limited data. Future research, whether quantitative, qualitative, or mixed-

model design, regarding higher education and law enforcement should follow the

progressive approach of these researchers.

In a 2010 article authored by Diana Bruns entitled, "Reflections from the One-

Percent of Local Police Departments with Mandatory Four-Year Degree Requirements

For New Hires: Are They Diamonds in the Rough?" in *The Southwestern Association of*

Criminal Justice, Bruns addressed the question, "Does a college degree make for a better

police officer?" Her qualitative research, designed in part to answer that question,

involved a survey of police chiefs, with 36 police chief respondents ($N = 36$) of the 37

surveys sent out (a 98% response rate). The opinions of the police chiefs varied, but the

majority (80.6%) expressed the opinion that officers who have completed a college

degree perform better than those who did not attend college. Bruns further found that

11.1% of the police chiefs felt that officers with a college degree did not necessarily

perform better than officers with no degree. The remaining 8.3% responded that they

were uncertain. This research, as with much of the earlier research regarding higher

education in law enforcement, involves an overly simplistic model without a sufficient

sample size to generalize. This research is exploratory in nature, providing guidance for

further and more extensive research.

Detractors and Critics

Although the early literature on the topic of higher education in law enforcement

consistently presents the relationship as positive, the relationship purported was primarily

based on rhetoric (Carter & Sapp, 1992). The research and literature on the topic of

higher education in law enforcement has drawn some criticism through the years.

According to Klahm and Tillyer (2010), in their article, "Understanding Police Use of

Force: A Review of the Evidence," in the *Southwest Journal of Criminal Justice*, "Most

of the variables used throughout the literature seem to have a mixed relationship with or

appear to be poor predictors of the use of force by police" (p. 214). Aside from the

criticism of research methodologies, various authors through the years have made claims

against higher education in law enforcement which deserve consideration. Detractors

include Bayley and Bittner (1984), who explain that "policing is more like a craft than a

science, in that officers believe that they have important lessons to learn that are not

reducible to principle and are not being taught through formal education" (pp. 128-129). Presenting a narrow view of the policing discipline, such propositions mitigate against serious consideration of law enforcement as a profession in need of higher educational standards.

Several detractors believe "college-educated officers are more likely to become frustrated with their work, with restrictions imposed by supervisors, and with limited opportunities for advancement" (Worden, 1990, p. 567). Eskridge (1999), posited that higher education had a negative impact in two notable areas: (1) concern that degreed officers had a tendency to experience boredom more often than their non-degreed counterparts, and (2) evidence of varying degrees of hostility toward degreed officers from non-degreed police officers. Eskridge (1999) also reported on the issue of professional envy which he defined as the hostility demonstrated by police academy instructors toward degreed officers entering the training academy as recruits. Similarly, hostility was noted when degreed officers received promotions based on criteria which was weighted toward college education as a primary consideration. Whetstone (2000) acknowledged that, "hiring candidates with improved credentials also invites eventual problems such as greater job dissatisfaction and personnel turnover" (p. 247). The negative influence has also been thought to actually extend to the quality of service provided by college-educated officers. Kakar (1998) further posited that a college education might decrease an officer's quality of service because police work does not

offer opportunities to stimulate the college-educated mind.

Baro et al. (1999) disagreed with the many recommendations indicating that officers need a bachelor's degree as a prerequisite for increased police professionalism in law enforcement. They expressed the belief that a police officer simply needs a high school diploma or GED and not a college degree. Some researchers even suggest that higher education in law enforcement is unnecessary because of the extensive training officers continually receive as well as the highly structured environment of the quasi-military method of operation commonly associated with policing. Baro et al. (1999) concluded the answer may be found in the appropriate integration of higher education and police training through involving criminal justice educators in the cooperative evaluation, development, and administration of the police training curriculum. Paoline et al. (2007) responded to the negative theorists and contributed in part to their argument by presenting that experience is a key factor in determining police performance regardless of education level.

Sherman and McLeod (1979) stated that the education received in colleges and universities was substantially similar to the training delivered in the police academies, which effectively rendered higher education irrelevant. The years following the aforementioned LEEP funding received similar criticism, as the curriculum offered through the many criminal justice programs was criticized for being akin to police academy training and not thought provoking nor based in sufficient theory. According to

Baro et al. (1999), given the extensive training received by officers in the academy and throughout their careers, along with the close similarities in police training programs and police-oriented higher education programs, it may be hard to justify more than a high school diploma or GED for entry into a law enforcement career.

A consistent concern also exists regarding the lack of satisfaction of officers who have college degrees in law enforcement and their lack of respect for the authority figures within their chain of command. Hudzick (1978) posited that degreed officers tended to minimize obedience to their supervisors and tended to express less satisfaction with their careers. Similarly, other researchers contend that "college-educated officers will quickly tire of the irregular hours, constant pressures, and relatively low pay of policing" (Varricchio, 1998, p. 11). According to Dantzker (1993), officer job satisfaction was found to increase with the level of higher educational attainment but only until officers reach five years on the job, when job satisfaction tends to drop due to the lack of promotional opportunity. Interestingly, Polk et al. (2001) found that higher educational attainment "was positively correlated to promotion into supervisory and administrative posts" (p. 77). Furthermore, Friedman (2006) aptly pointed out that "chiefs who mandate the degree should be aware that the transition period . . . could be difficult," as "police officers sometimes resist higher education" (p. 23). Such internal resistance can be expected, as a critical cultural change in an organization generally takes five to seven years to come to fruition (Bennett et al., 2007).

Conclusion

Despite the criticism of higher education in law enforcement, positive strides continue to be made. Although higher education standards have not been universally imposed throughout the United States, growth in the number of college educated officers among the rank and file in law enforcement has been consistent. Carter and Sapp (1990) expressed that regardless of the lack of degree requirements, 23% of police officers have obtained a four-year degree and 65% of police officers have at least one year of college. Cunningham (2003) reported that in the State of Florida, which only has a high school diploma hiring requirement, 16% of officers possessed a two-year degree, while 24% of officers had completed a bachelor's degree. Considering that only 1% of agencies were found to have four-year degree requirements (Hickman et al., 2004), over 23% of officers having at least a four-year degree is a telling trend toward increased higher education in law enforcement. In other words, it is apparent that officers in the field and prospective candidates are completing higher education degrees in greater numbers even in the absence of educational mandates.

Public perception tends to favor degree requirements for law enforcement. Certainly, public expectation of police officer competencies and performance has risen through the years. One study found that 89% of citizens support a degree requirement for police, and citizens were surprised to learn that it was not already mandated. Officer perception has been evaluated as well. Officers with college degrees believe that the educational journey enhanced their skills related to communications, human relations, administration, and critical thinking, as well as acquiring a wealth of knowledge

regarding the criminal justice system, law, and procedure (Carlan, 2006). Higher

education institutions may also play an important role beyond the curriculum offered to

law enforcement officials. Baro et al. (1999) cited the 1997 Bureau of Justice Statistics

in reporting only 2% of campus police departments required a bachelor's degree as a

minimum educational requirement for entry level employment as an officer. Clearly, the

public's perception regarding higher education in law enforcement may be affected by

such policies.

Despite an early history of research criticized for being methodologically unsound

or exploratory at best, the vast majority of the research indicates that higher education

standards for law enforcement will likely have a positive influence on officer

performance. The most recent trend of sophisticated quantitative research, as conducted

by Fyfe et al. (2004), Paoline et al. (2007), and Ryberg et al. (2010), serves to provide a

positive outlook on the future of research concerning the topic of higher education and

law enforcement. Each of these studies utilized a multivariate approach rather than the

historical norm of focusing on one variable in disregard of the many confounding

variables found to influence outcomes. Most of the research reviewed but not included

herein is qualitative in nature with small sample sizes and low rates of response. Future

research, to be most beneficial to answering the important questions on this topic, will

need to be both quantitative, qualitative, and mixed-model design research in order to

provide a comprehensive assessment to serve as the basis for appropriate policy

decisions. At this point, the empirical evidence supports higher education standards for

law enforcement, but clearly there is still room left for debate.

III. Design and Methodology

Introduction

This study was designed to explain the influence of higher education on entry

level law enforcement examination outcomes with the intent of contributing to the

existing field of knowledge regarding the various implications of higher education on law

enforcement. "No single study, even an experimental one, could be definitive" (Krueger,

1999, p. 529), yet this study in its design and methodology was certainly intended to

contribute to the existing body of research. Unfortunately, over one hundred years of

research and debate regarding the need for higher education standards in law enforcement

has been devoid of answers related to the question of whether earning a college degree

contributes to higher outcomes on an entry level law enforcement hiring examination.

While not providing definitive proof, this study is designed to provide further insight into

the relationship between higher educational attainment and entry level law enforcement

examination outcomes.

Although research supports the belief that higher education promotes police

professionalism, fosters higher job satisfaction, and enhances certain core competencies

(Breci, 1994; Smith & Aamodt, 1997; Varricchio, 1998; Harwick Day, 2002), current

high school students who aspire to a career in law enforcement have little guidance from

the existing research as to the immediate and direct benefits they will likely derive from

earning a college degree. One such benefit is achieving a sufficiently high score on the

eligibility examination to be considered for a law enforcement position. While the most

frequently utilized measure of academic achievement has often been years of school

completed (Hanusheck, 2007), the proper focus must shift to actual performance (Coleman et al., 1966). Performance with respect to competitive entry level law enforcement testing is often measured in terms of an exceptional score on the examination resulting in high placement on an ordinal hiring list. The true challenge for prospective law enforcement officers exists in performing on a relative scale on the singular assessment instrument. The examination is not a pass or fail exercise, nor do personal credentials, such as higher educational attainment, factor directly into a candidate's placement on the hiring list.

Considering the theoretical rationale of production-function as posited by Hanusheck (2007), the considerable time, money, and effort dedicated to earning a college degree should logically provide a benefit or applied advantage toward entrance into a desired career field. Absent achieving a superior score on the dedicated selection instrument, college graduates are limited in their opportunity to apply the knowledge, skills, and abilities acquired and enhanced through higher education. The process is simple; either the prospective law enforcement candidate achieves a sufficiently high score relative to his or her competition, or the candidate is effectively eliminated from consideration for employment. Absent a high outcome on the examination, the prospective candidate is rendered ineligible, not by categorical failure, but by virtue of his or her low placement on the hiring list. The ordinal nature of the hiring list based on the candidate's numerical score from the Law Enforcement Aptitude Battery establishes and further reinforces the importance of performance on the sole assessment instrument utilized in the initial phase of the selection process.

While non-experimental in design, this study, through systematic correlation analyses and simultaneous, multiple, linear regression analysis, focuses on explaining the influence of higher educational attainment on law enforcement examination outcomes. As such, it remains important not to confuse correlation with causation, as "correlations provide clues to causality, but they do not demonstrate or test for causality; they only qualify the strength and direction between variables" (Nolan et al., 2008, p. 227). The design of this study and the quantitative strategies employed provide for "correlational" analyses that are not intended to determine causation (Cambell & Stanley, 1963, as cited in Creswell, 2009, p. 12). This study was designed to describe the relationship between multiple, independent, qualitative variables and the continuous, quantitative, outcome variable. Through appropriate dichotomous coding of the qualitative variables, a proper quantitative analysis through simultaneous, multiple, linear regression can be conducted to determine the predictive value of the independent variables on the outcome variable (Leech et al., 2011).

The Sample Population

The qualitative and quantitative data utilized in this study were derived from three hundred and sixty-five ($n = 365$) candidates who participated in a two-day, sixteen-hour, exam preparation course conducted by a private, for-profit, professional development training company. The respective data were gathered through the acquisition of archival records from both the private, for profit, professional development training company and the New Jersey Civil Service Commission. The participants are a diverse group of

individuals reflective of the diversity in the overall population of New Jersey Entry Level

Law Enforcement Examination (LEE) candidates and also reflective of the diverse

population currently serving in law enforcement today. This sample ($n = 365$) is a

convenience sample of students who attended the preparatory course at either a northern,

central, or southern New Jersey training location during the fall of 2010. While the

private training company, Holtz Learning Centers, Ltd., held ten separate training

seminars, this convenience sample was derived from students who attended one of four

particular sessions.

According to company officials, the information was initially collected to provide

them with descriptive data to analyze from their northern, central, and southern New

Jersey student population. While the sample was not selected and the data were not

collected for this particular academic endeavor, the availability of the sample and the

corresponding archival data are essential to the conduct of this study. "In many [studies]

only a convenience sample is possible because the researcher must use naturally formed

groups" (Creswell, 2009, p.155). Given the proprietary interests inherent in a private

enterprise, combined with the statutorily confidential aspect of the candidate contact

information through the New Jersey Civil Service Commission (NJCSC), this study

would not be possible without the diligent efforts of the private training firm to collect

substantive data and make the data available for public review. The training firm

provided public access to the archival data through a posting on the website,

holtzlearningcenters.com, as "data available upon request."

Ability to Generalize to Population

While this study was intended to contribute to the existing field of knowledge and serve as a basis for further research, the small size of the sample ($n = 365$) threatens the generalizability of the results. The need for a larger sample size is primarily due to the design of this research, as it involves the use of dichotomously coded categorical data for simultaneous, multiple, linear regression analysis. According to Krejcie and Morgan (1970), dichotomous coding of categorical data for use in simultaneous regression analysis requires a larger sample size than that commonly recommended for continuous data. Generally, when conducting educational research utilizing dichotomously coded categorical data, a margin of error of 5% is acceptable (Krejcie et al., 1970). Based on the sampling formula espoused by Cochran (1977), with the alpha level set at .05, the use of proportional (dichotomous) variables, a 5% level of acceptable error, the estimate of standard deviation of the scale set as .05, and a t value of 1.96, the minimum sample size for this study is 384 participants ($n = 384$). Since the sample size of 384 as proposed, utilizing Cochran's formula does not exceed 5% of the population size of this study ($N = 18,487$), the correction formula as presented by Cochran (1977) is inapplicable. Based on the sample size formula presented by Cochran (1977) as it applies to the research design of this study, the generalizability of the findings of this research is questionable. Since this research involves the use of archival data containing a fixed sample size of 365 participants, this researcher was unable to increase the sample size to the minimum sample size of 384 as recommended by Cochran (1977).

A further analysis of sample size utilizing the standards established by Krejcie et al. (1970), reveals a minimum acceptable sample size for this study as 376 participants (n = 376). As such, according to the sample of 365 (n = 365) participants utilized in this research, the findings are only generalizable to a tested population of 7,500 (N = 7,500). The distinction between the actual sample size utilized in this research and the sample size calculations of either Krejcie et al., (1970) or Cochran (1977), although seemingly minimal, are cause for concern related to the generalizability of the findings from this study.

Data

The private, professional development training firm administered the preparatory course on ten separate occasions throughout the fall of 2010 in anticipation of the New Jersey Civil Service Commission's administration of the Entry Level Law Enforcement Examination (LEE). Students from four of the ten training sessions were asked by company staff to self-report particular biographical information. Specifically, the private training firm made available upon request specific biographical data for three hundred and sixty-five students (n = 365). The biographical data included each student's gender, age, race, and level of education as well as each student's corresponding score on the 2010 New Jersey Entry Level Law Enforcement Examination (LEE). The outcomes were released to candidates by the New Jersey Civil Service Commission several months after the administration of the examination and publicly available through the Open

Public Records Act (OPRA), N.J.S.A. 47:1A-1 et seq. The training company collected

the information from each student with the understanding the information would be used

for various statistical analyses and further study purposes. The practice of collecting

student data and the corresponding official examination scores from the State of New

Jersey is a regular occurrence within the training firm, as company officials commonly

conduct internal research to validate internal assessment instruments, track success rates

of students, and engage in marketing research (L. Holtz, personal communication, March

30, 2011).

The biographical information collected from each participant involved much more

than the variables being considered in this study, yet company officials made available

only minimal descriptive data for public review. Although limited, the archival data

provided were sufficient for the completion of this study. Company officials took the

appropriate steps to ensure the confidentiality and anonymity of their students by

supplying each student's self-reported age, race, gender, and level of education along

with the student's corresponding final score on the 2010 Entry Level Law Enforcement

Examination (LEE) (L. Holtz, personal communication, March 30, 2011). The student

data, as provided in a Microsoft Excel™ spreadsheet format were numbered from 1

through 365 devoid of the student's name (Appendix E). As such, this study did not

involve the names or identity of individual participants, nor was further inquiry directed

to participants possible in order to gather additional information.

Research Design

A research design is methodically developed with the purpose of providing a defined structure for the research (Hinkle, Wiersma, & Jurs, 2003). This non-experimental, archival study includes the use of pre-existing data required to account for each of the independent/predictor variables as well as the dependent/outcome variable. The design accounts for formal entry level law enforcement examination preparation as a potentially confounding variable. "Confounding variables include anything that systematically varies with the independent variable so that we cannot logically determine which variable is at work" (Nolan et al., 2008, p. 12). This includes the potentially confounding variables of study techniques and test-taking strategies which have been addressed in prior research and found to have an influence on standardized, multiple-choice, law enforcement examination outcomes (Whetstone, 2000). By utilizing archival data derived from a convenience sample of prospective law enforcement candidates who attended a preparatory course, this researcher was able to control for formal examination preparation.

Based on the legal mandate in New Jersey requiring candidates to have completed at least high school or a GED for law enforcement eligibility, the convenience sample included participants who met that basic standard. Therefore, the design of this research includes the control of the minimum level of education being the completion of high school or a GED to establish the reference variable within the simultaneous, multiple,

linear, regression model.

This research design includes the use of the sophisticated statistical program IBM SPSS Version 19™ to perform the varied statistical analyses related to this study. The design includes bivariate correlational analyses to identify the strength of the relationship among the independent variables and identify any multicollinearity concerns. Upon completion of the bivariate correlational analyses, the utilization of IBM SPSS Version 19™ was necessary to complete simultaneous, multiple, linear regression analysis toward explaining the influence of higher education on entry level law enforcement examination outcomes. "Regression is a useful tool that builds on correlation; it not only enables us to quantify the relationship between two variables but also to predict a score on a dependent variable from a score on an independent variable" (Nolan et al., 2008, p. 262). Specifically, the dependent variable in this study is examination outcomes on the biennially administered, standardized, multiple-choice Law Enforcement Aptitude Battery (LEAB)™ as administered by the New Jersey Civil Service Commission under the title of the New Jersey Entry Level Law Enforcement Examination (LEE). The examination scores are publicly available through the New Jersey Civil Service Commission via the Open Public Records Act (OPRA), N.J.S.A. 47:1A-1 et seq.

The independent variables as received in the archival data file included: gender, age, race, and the highest level of higher education completed by each of the participants in the sample. Due to the qualitative nature of the predictor variables and the quantitative analysis of this design, binomial, dichotomous coding was necessary for the development

of a simultaneous, multiple, linear regression model. The dichotomous variables, gender

and race, were each coded (0,1) to represent male/female and White/or non-White,

respectively, while level of higher education required aggregation and dichotomous

coding as distinct and separate variables within the model. The levels of higher

education were coded as follows: other than associate degree/associates degree earned

(0,1) and other than a bachelor's or master's degree/bachelor's or master's degree earned

(0,1). The reference variable in this simultaneous, multiple, linear regression analysis

consists of the remaining participants who completed high school yet did not complete a

higher education degree, as they are simply coded as (0) and therefore not entered

directly into the regression equation (Leech, et al., 2011). Due to the continuous nature

of age as a predictor variable, participant's age was simply entered into the regression

model based on the years of age listed for each participant without the need of

dichotomous coding. The outcome variable as derived through the archival records was

available in numerical form as interval data. Consistent with this design, the interval

outcome variable, in combination with the conversion of qualitative predictor variables to

quantitative values via binomial, dichotomous coding, allowed for the proper

development of a quantitative analysis through simultaneous, multiple, linear regression.

The archival data related to each student's level of higher educational attainment

included self-reported student responses indicating the highest level of education

completed by August 31, 2010. The designated date corresponded with the established

closing date for applications for admission to the 2010 New Jersey Entry Level Law

Enforcement Examination (LEE). The categories available within the original data

included: (1) GED only, (2) high school only, (3) high school or GED plus some college

but no degree completed, (4) associate's degree completed, (5) bachelor's degree

completed, and (6) master's degree completed. The data, supplied by the professional

development training company and entered in the Microsoft Excel™ spreadsheet,

represented the students' individual responses, respectively, to each category.

This design includes the aggregation of the categorical data to account for degree

completion as the predictor variables. The aggregation was not due to multicollinearity

concerns, but to provide for the consideration of actual degree completion, limiting the

number of variables entered into the regression model to potentially increase power, and

ensuring adequate representation of participants in each category. The identification of

multicollinearity concerns may be accomplished through bivariate correlation analyses

and the development of a correlation matrix. If a high correlation exists among predictor

variables, then a multicollinearity problem may exist in the model. If predictor variables

are highly correlated, then consideration must be given to whether the respective

variables are distinctly different or related to one another conceptually (Leach, 2011).

Within this research design and beyond the preliminary aggregation of data to form the

predictor variables in this model, the existence of multicollinearity among predictor

variables would require further aggregation of variables or the omission of select

variables from the model.

With respect to aggregation, participant eligibility for admission to the examination was dependent upon the completion of a high school degree or a GED prior to the closing date for the examination. Given the minimum educational standard established for eligibility and the lack of completion involved in the category, "high school or GED plus some college but no degree completed," the three categories were aggregated to form the single reference variable: High School or GED. The "associate's degree" category did not require aggregation and therefore was dichotomously coded and included in the model as a predictor variable: other than associate's degree/associates's degree earned (0,1). The remaining two categories, "bachelor's degree" and "master's degree" were aggregated, dichotomously coded, and included in the model as a predictor variable: other than a bachelor's or master's degree/bachelor's or master's degree earned (0,1).

Upon verification of the accuracy of the data entry and conversion to the necessary binomial, dichotomous coding of the categorical, predictor variables into the IBM SPSS Version 19™ software, this research design requires the development of the regression model and the output produced for analysis. Utilizing the "enter" method to provide for simultaneous, multiple, linear regression, the model was developed including age, gender, race, associate's degree, and bachelor's degree/master's degree as the independent/predictor variables. The "exam score" variable, consisting of interval data, was entered as the dependent/outcome variable.

Analysis of Data

The archival data as received in original form from the professional development training company required methodical entry into the IBM SPSS Version 19™ software with proper binomial, dichotomous coding of the categorical predictor variables. Once each of the four independent variables and the outcome variable was methodically entered in the data view of the IBM SPSS Version 19™ software, a systematic verification of the accuracy of the data entry was conducted for each of the 365 participants ($n = 365$). The analysis of this data began with basic descriptive statistics to review the frequencies of variables among the participants.

A review of the frequency distributions was followed by bivariate correlation analyses and the production of a correlation matrix for review (Appendix A). The review of the data within the correlation matrix was intended to identify potential multicollinearity issues. Specifically, the review is to identify very strong correlations among predictor variables and determine whether aggregation or omission of variables was necessary. The absence of multicollinearity allows for the entry of predictor variables into the regression model. "Regression is usually a more powerful tool than correlation and is widely used across many different applications" (Nolan et al., 2008, p. 264). Within IBM SPSS Version 19™, the "enter" method is required when conducting simultaneous, multiple, linear regression analysis. The development of the model includes input of the predictor variables: age, gender, race, associate's degree, and bachelor's degree/master's degree. The outcome variable of the model consists of the specific score each participant achieved on the 2010 administration of the Law Enforcement Aptitude Battery (LEAB)™.

The data were analyzed and reported based on the statistical significance of the model as indicated in the ANOVA table through the F statistic and the level of significance value presented in the ANOVA table. The alpha or level of significance for the analysis was set at .05 ($p < .05$). The ANOVA table provides for an F statistic as well as a level of significance in the analysis of variance.

The analysis of the simultaneous, multiple, linear regression output included a review of the model summary to identify the effect size through an assessment of the proportionate reduction in error as indicated in the Adjusted R Squared of the output. "The proportionate reduction in error is a measure of the amount of variance in the dependent variable that is explained by the independent variable[s]" (Nolan et al., 2008, pp. 273-274). The Adjusted R Squared statistic is utilized in simultaneous, multiple, linear regression rather than the R Squared statistic, as the Adjusted R Squared accounts for the number of independent variables included in the model (Leech et al., 2011). The reporting of the effect size through the Adjusted R Squared identifies the percentage of variance in the dependent variable that is explained by the independent variables in the model.

Provided the model has statistical significance as indicated by the F statistic and level of significance in the ANOVA table, the coefficients table is utilized to assess the unstandardized beta, t-statistic, and the level of significance (p value) for each of the independent variables in the model. It is the beta for each of the statistically significant variables that indicates the predictive value, either negative or positive, of the respective predictor variable. The beta indicates the magnitude of change of the outcome variable based on each increment of the predictor variable.

Summary

Given the fact that the data involved in this study are commonly not available to researchers, this study should provide a substantial contribution to the existing body of knowledge and serve as a basis for further inquiry. Prior research related to this topic has yet to answer the question of whether higher educational attainment influences entry level law enforcement examination outcomes. Answering this question has been made more difficult due to the proliferation of formal preparatory programs geared toward the entry level examination process. Formal entry level law enforcement examination preparation as a potentially confounding variable is addressed in the design of this research. The potentially confounding variables of study techniques and test-taking strategies have also been addressed in prior research (Whetstone, 2000). This particular research is unique, given the intent in the design to control for the potential influence of formal examination preparation on examination outcomes. Each participant was exposed to the same study techniques and test-taking strategies through attendance at a two day, sixteen hour, preparatory course.

The data being utilized for this research are commonly not available due to the highly competitive business interest related to the administration of a private-sector, professional development training company. The combination of relevant student data and specific examination outcomes for each participant allow for quantitative analysis otherwise not available for review and study. Furthermore, the standardized, multiple-choice Law Enforcement Aptitude Battery (LEAB)™ is used by hundreds of hiring agencies throughout the nation as a comprehensive selection instrument. As such, the LEAB™ serves as an excellent assessment instrument for this particular study.

IV. Analysis of the Data

Introduction

Entry into the field of law enforcement often requires, at the initial phase, relative success on a competitive examination which, in practical application, serves as the gateway to the remainder of the hiring process. As a natural progression beyond high school, many prospective law enforcement officers attend college and complete associate's, bachelor's, and in some cases, master's degrees in a concerted effort to prepare for a successful career in law enforcement. The research and literature on higher education in law enforcement propounds varied benefits of college in preparing a person for enhanced performance once on the job and practicing in the field. This study recognizes the distinction between field performance and performance on the examination utilized to determine eligibility for an entry level position in law enforcement. Prospective law enforcement candidates in New Jersey must not only prepare themselves for the challenges they will ultimately face at a police training academy as well as during a long and successful career, each candidate must first meet the challenge of the competitive Law Enforcement Assessment Battery as developed by EB Jacobs Corporation and administered by the New Jersey Civil Service Commission.

This research, as based on the theoretical rationale of production-function (Hanusheck, 1979), endeavored to address the issue of whether the well-documented expense and commitment of completing a college degree contributes to success on the entry level law enforcement examination. Beyond the tremendous time commitment and expense associated with earning a college degree, aspiring candidates often attend

preparatory courses specifically designed to assist the candidate in achieving higher

outcomes on the entry level law enforcement examination. These efforts are often

deemed necessary, as the entry level examination administered in New Jersey, as in other

states, is extremely competitive. Over 30,000 candidates commonly apply for the

examination, seeking eligibility for the relatively few available law enforcement

positions. Given the considerable preparation believed to be necessary to succeed in a

highly competitive career field, and more specifically, to gain entry into the field of law

enforcement, serious examination was necessary to explain the influence college has on

achieving a competitive score on the Law Enforcement Aptitude Battery (LEAB)™.

Throughout history, research assessing variables that influence standardized examination

outcomes has commonly included and accounted for gender, race, and age along with the

primary predictor variables being addressed as the focus of the respective study.

Likewise, the research design of this study accounts for gender, race, and age as

independent variables in the model along with each participant's highest level of

education completed.

This explanatory study was designed to investigate and explain the influence of

higher educational attainment on outcomes on the commonly utilized Law Enforcement

Aptitude Battery (LEAB)™ as designed by the EB Jacobs Corporation. This study was

necessary, as current research did not explain whether earning a college degree was

predictive of higher outcomes on the competitive entry level examination. While

intuitively one may have believed the knowledge, skills, and abilities gained or enhanced

through the college curriculum and experience would provide a competitive advantage on

a written, multiple-choice examination, it was unknown prior to this research whether the

data support such an assertion.

This study involved participants who attended a two-day, formal preparatory course prior to the administration of the LEAB™ in New Jersey during the fall of 2010. Controlling for the potentially confounding influence of formal exam preparation was a very unique aspect of this study. A comprehensive review of the literature revealed a conspicuous absence of research accounting for formal examination preparation when assessing the influence of higher education on law enforcement examination outcomes. The lack of research is likely due to the notable lack of available data. The proprietary nature of the records related to students who have attended a private-sector, for profit course generally renders the data unavailable for inclusion in a comprehensive academic study. This study included detailed biographical data for each of the participants along with each participant's actual examination score on the 2010 LEAB™ as administered by the New Jersey Civil Service Commission under the heading of the New Jersey Entry Level Law Enforcement Examination (LEE).

Research Questions

"Social scientists create constructs (hypothetical ideas) as they seek to translate observations about human behavior into numbers that genuinely represent those observations" (Nolan et al., 2008, p. 9). The research questions in this study directly centered on explaining the relationship between higher educational attainment and outcomes on a commonly administered law enforcement entry level examination.

Through a non-experimental, quantitative design, this study, whose main focus is to ascertain how much variance in multiple-choice Law Enforcement Aptitude Battery (LEAB)™ outcomes is explained by the level of educational attainment of the candidate

taking the examination, addressed the following research questions:

1. How much variance in multiple-choice Law Enforcement Aptitude Battery (LEAB)™ outcomes is explained by the attainment of an associate's degree?

2. How much variance in multiple-choice Law Enforcement Aptitude Battery (LEAB)™ outcomes is explained by the attainment of a bachelor's degree or master's degree?

Data/Participants

The data in this study were derived from archival records related to a convenience sample of three hundred and sixty-five participants ($n = 365$). The archival data were obtained from the business records of a privately held professional development training company which specialized in the preparation of prospective law enforcement candidates for the New Jersey Entry Level Law Enforcement Examination (LEE). Reliance on the archival data was necessary in this study, as the participant information would not otherwise be accessible for academic assessment. "Often archival data allow us to study phenomena we could not study otherwise for either practical or ethical reasons" (Nolan et al., 2008, p. 30). The company, Holtz Learning Centers, Ltd., collected the data directly from adult students as part of the company's general business practices to engage in both formative and summative assessment of curriculum, in-class testing, and student performance (L. Holtz, personal communication, March 30, 2011). The data included biographical information on 365 students who attended one of four training courses of the ten courses offered in the fall of 2010. The data was provided in a Microsoft Excel™ spreadsheet format inclusive of the score each student achieved on the 2010 New Jersey Entry Level Law Enforcement Examination (LEE). The respective data included each

participant's age, gender, race, highest level of education attained, the type of degree earned (if applicable), and each participant's score on the 2010 LEE. The biographical information associated with each participant was enumerated from 1 to 365 within the data file (Appendix E) in lieu of each participant's name to maintain student confidentiality. Additional data regarding the specific type of degree earned, although provided in the archival data were not utilized in this study.

Along with the convenience sample data obtained from the professional development training company, this researcher obtained the official examination scores from the New Jersey Civil Service Commission for the 2010 LEE through an Open Public Records Act request pursuant to N.J.S.A. 47:1A-1. The data provided by the State of New Jersey for those candidates within the law enforcement entry level eligibles pool included the formal name of each candidate who passed the examination, the candidate's jurisdiction of residence, veteran's status, and score on the examination. The data were supplied by the State of New Jersey in a Microsoft Excel™ spreadsheet format and included data for 18,487 candidates (N =18,487). Notably, the New Jersey Civil Service Commission would not release any information beyond that strictly required by New Jersey law. Under New Jersey's Open Public Records Act (OPRA) as prescribed in N.J.S.A. 47:1A-1 et seq., certain records related to civil service testing were specifically exempt from the public accessibility requirements of most government documents. As such, the information released by the State of New Jersey was limited to each candidate's name, jurisdiction of residence, veteran's status, and examination score. According to the New Jersey Civil Service Commission, information such as a candidate's age, gender, race, level of education, and other biographical information obtained by the State of New

Jersey was considered confidential and not available to the public (J. Richter, personal

officer. Undoubtedly, at the time, a Commission decision to allow for the imposition of

educational standards for all participating police agencies would have resulted in

expensive and time-consuming litigation initiated by interest groups on behalf of

individuals adversely impacted by the decision.

In a study entitled, "Higher Education as a Bona Fide Occupational Qualification

(BFOQ) for Police: A Blueprint" (1988), Carter et al. explored various issues related to

higher educational requirements for police officers in law enforcement. The City of

Dallas stipulated that the employment requirement had a disparate impact on Black

candidates that was statistically significant (Davis, 1985). As a result of the statistical

finding of disparate impact in the Davis case, the city held the burden of proving and

subsequently proved the educational requirement was a "business necessity" and

therefore a BFOQ.

The BFOQ study, conducted by Carter et al. (1988), examined other court

decisions related to basic high school education requirements in law enforcement. Their

assessment included the Boston Police Department, which had a requirement of a high

school diploma as well. In the case of *Castro v. Beecher* 459 F. 2d 725 (1st Cir. 1972),

the court affirmed the high school diploma requirement the city had imposed on police

applicants. The study, through these and other case references, revealed the courts in the

United States have consistently recognized education as a bona fide occupational

qualification. The *Davis* case serves as the most significant case on educational standards

revealed the mean score of candidates (N = 18,487) who passed the law enforcement

entry level examination was 85.36 with a standard deviation of 8.64 (M = 85.36, SD =

8.64, SE = .064). The minimum passing score on the examination was set at 70.00 points

and the maximum score possible was 99.999 points resulting in a 29.999 point range in

the score data. The interquartile range (IQR) of the 2010 LEAB™ outcomes was 7.39

points.

Figure 1 depicts the frequency distribution of the scores from the entire

population (N = 18,487) of candidates who sat for and successfully passed the 2010

LEAB™. As displayed in Appendix C, the relative proportionality of scores across the

frequency distribution from the range of 70.000 to 99.999 points is indicative of a

standardized, internal scoring scale utilized by the contracted test development company.

The scores in the complete data file are distributed across the entire 29.999 point range to

one-hundredth of a point (with the exception of 99.999), allowing for 3000 separate and

distinct scores among the 18,487 candidates in the eligibles pool. The scores are

generally maintained by the New Jersey Civil Service Commission within the eligibles

pool of candidates for a two year period. The scores are utilized to formulate certified

lists by job title and jurisdiction for law enforcement positions within the more than 190

police departments falling under the New Jersey Civil Service Act, N.J.S.A. 11A:1-1 et

seq. As such, a scoring difference of only one-hundredth of a point is often the

distinction in candidates' ordinal rank on the hiring list and ultimately their ability to be

considered for law enforcement employment within the statutorily restrictive "rule of

three" under N.J.S.A. 11A:4-8.

Table 1

Descriptive Statistics Related to the 2010 Statewide LEAB™ Examination Scores from the Population (N = 18,487)

New Jersey 2010 Statewide LEAB™ Scores

N	Valid	18,487
	Missing	0
Mean		85.356
Std. Error of Mean		.0635
Median		85.490
Mode		70.030[a]
Std. Deviation		8.638
Range		29.999
Minimum		70.000
Maximum		99.999
	25	77.930
	50	85.490
Percentiles	75	92.880
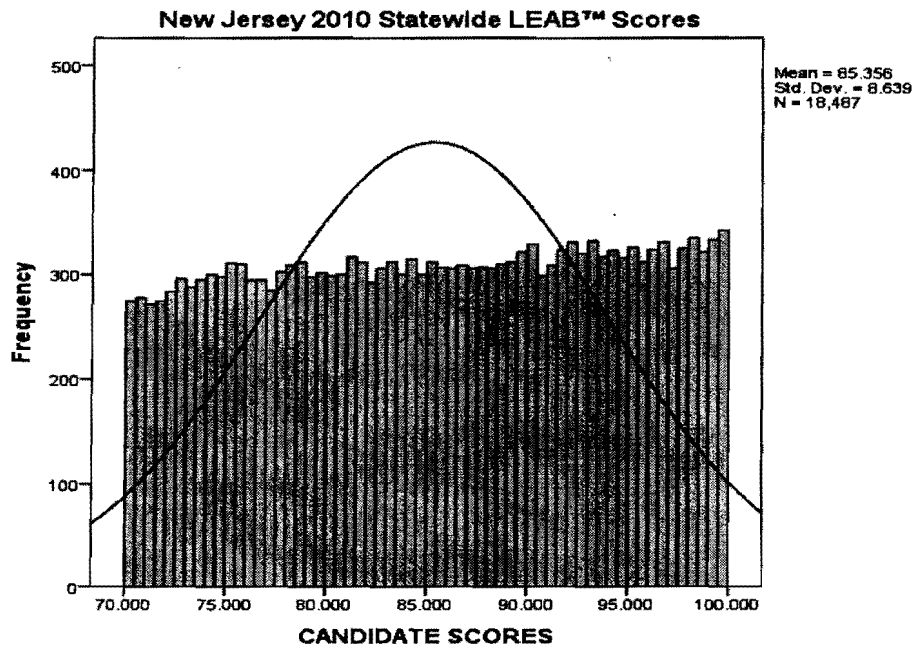
Figure 1. Frequency distribution of 2010 LEAB™ examination scores from the population (*N* = 18,487).

As indicated in Table 2, an analysis of the convenience sample of participants ($n =$ 365) within the archival data who attended the preparatory course revealed a mean score of 92.49 with a standard deviation of 5.75 ($M = 92.49$, SD = 5.75, SE = .301). The lowest passing score achieved by participants in the sample was 73.77 points and the highest score achieved was 99.98 points, resulting in a 26.31 point range in the sample score data. The interquartile range (IQR) for the convenience sample of participants who attended the preparatory course was 5.23 points.

The mean difference of the scores achieved between the 18,487 candidates within the data provided by the New Jersey Civil Service Commission and the scores achieved by the 365 candidates represented in the sample of participants who attended the formal examination preparatory course was 7.13 points. Through the use of a non-directional, one sample t-test with a critical t value of ± 1.96 and a 95% level of confidence with the alpha or level of significance set at .05 ($\alpha \leq .05$), the mean difference of 7.13 points was found to be statistically significant ($t = 23.71$, $df = 1, 364$, $p < .000$). The data indicate that those candidates who attended the preparatory course tended to score 7.13 points higher on average than those who either did not attend the course or attended a different course. This distinction in the mean score of the overall population of candidates who successfully passed the 2010 LEAB™ and the mean score of the sample of candidates who attended the preparatory course supports the intent within this study to control for the influence of formal exam preparation as a potentially confounding influence. Understanding the potential influence of formal examination preparation on higher examination outcomes, the control in this study was effectuated through the utilization of a convenience sample of candidates who all attended the same 16 hour, formal exam preparation program.

November and December of 2010. According to EB Jacobs (2009), three equally weighted versions of the LEAB™ were produced and validated for the State of New Jersey to account for the administration of the examination across multiple sessions.

Level of Education

The categories related to the highest level of education attained by each participant as provided in the archival data obtained through the professional development training company, were specifically listed in the original Microsoft Excel™ spreadsheet as follows: (1) GED only, (2) high school diploma only, (3) high school or GED plus some college but no degree completed, (4) associate's degree completed, (5) bachelor's degree completed, or (6) master's degree completed. The data represented what each individual participant reported as his or her highest level of education completed as of August 31, 2010. This corresponded with the closing date established for eligibility for the entry level law enforcement examination which was set by the State of New Jersey as August 31, 2010 (New Jersey Civil Service Commission (2010a). As depicted in Appendix E, the original data file, as received from the private, professional development company, included four participants who indicated GED only ($n = 4$), 33 participants who indicated high school diploma only ($n = 33$), 127 participants who indicated high school diploma plus some college but no degree earned ($n = 127$), 68 participants who indicated associate's degree ($n = 68$), 123 participants who indicated bachelor's degree ($n = 123$), and 10 participants who indicated master's degree ($n = 10$).

The four participants listed as GED only ($n = 4$), the 33 participants listed as high school diploma only ($n = 33$), and the 127 participants listed as high school diploma plus some college but no degree earned ($n = 127$), as provided in the Microsoft Excel™

spreadsheet, were aggregated and entered into IBM SPSS Version 19™ by this researcher and operationalized as high school diploma/GED (1) or not (0). The classification of high school diploma/GED without the acknowledgment of the college credits earned short of a formal degree was utilized to emphasize degree completion within this study. The 68 participants listed as associate degree (n = 68) as provided in the Microsoft Excel™ spreadsheet, were entered into IBM SPSS Version 19™ by this researcher and operationalized as associate degree (1) or not (0). The 123 participants listed as bachelor's degree (n = 123) and the 10 participants listed as master's degree (n = 10), as provided in the Microsoft Excel™ spreadsheet, were aggregated and entered into IBM SPSS Version 19™ by this researcher and operationalized as bachelor's degree or master's degree (1) or not (0). The aggregation of bachelor's degree and master's degree was necessary due to the very small sample size of those who had completed a master's degree. This sample of 365 participants was comprised of 45%, whose highest level of educational attainment was a high school diploma or GED, 18.6% whose highest level of educational attainment was an associate's degree, and 36.4% whose highest level of educational attainment was a bachelor's degree or master's degree. Overall, 55% of the participants in the sample (n = 365) had completed at least an associate's degree.

As indicated in Table 3, a descriptive analysis of the scores achieved when grouping participants in the sample by level of formal education completed revealed that the mean score for participants with a high school diploma or GED earned but no college degree earned (n = 164) was 92.15 (M = 92.15, SD = 6.12, SE = .478). The participants who completed an associate's degree (n = 68) achieved a mean score of 92.29 (M = 92.29, SD = 5.43, SE = .658). Participants who completed a bachelor's degree or master's

degree (n = 133) achieved a mean score of 93.03 (M = 93.03, SD = 5.43, SE = .471). The

mean of the overall sample of participants (n = 365) was 92.49 with a standard deviation

of 5.75 (M = 92.49, SD = 5.75, SE = .301).

Table 3

Descriptive Statistics Related to Level of Education and the 2010 LEAB ™ Examination
Scores from the Sample (n = 365)

Scores by Level of Education

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
No College Degree	164	26.08	73.77	99.85	92.1464	.47795	6.12081	37.464
Associate's Degree	68	21.63	78.00	99.63	92.2874	.65833	5.42870	29.471
Bachelor's/Master's Degree	133	21.05	78.93	99.98	93.0295	.47074	5.42883	29.472
Valid N (listwise)	0							

Age

The average age of the participants within the sample was 25.46, while the

median age was 25 and the mode was 23 years of age (M = 25.46, SD = 4.489, SE =

.235). The age range was 23, as the youngest participants were 18 (n = 2) and the eldest

was 41 (n = 1). As depicted in Figure 3, age was positively skewed, as the majority of

the participants were between the ages of 21 and 30 years of age.
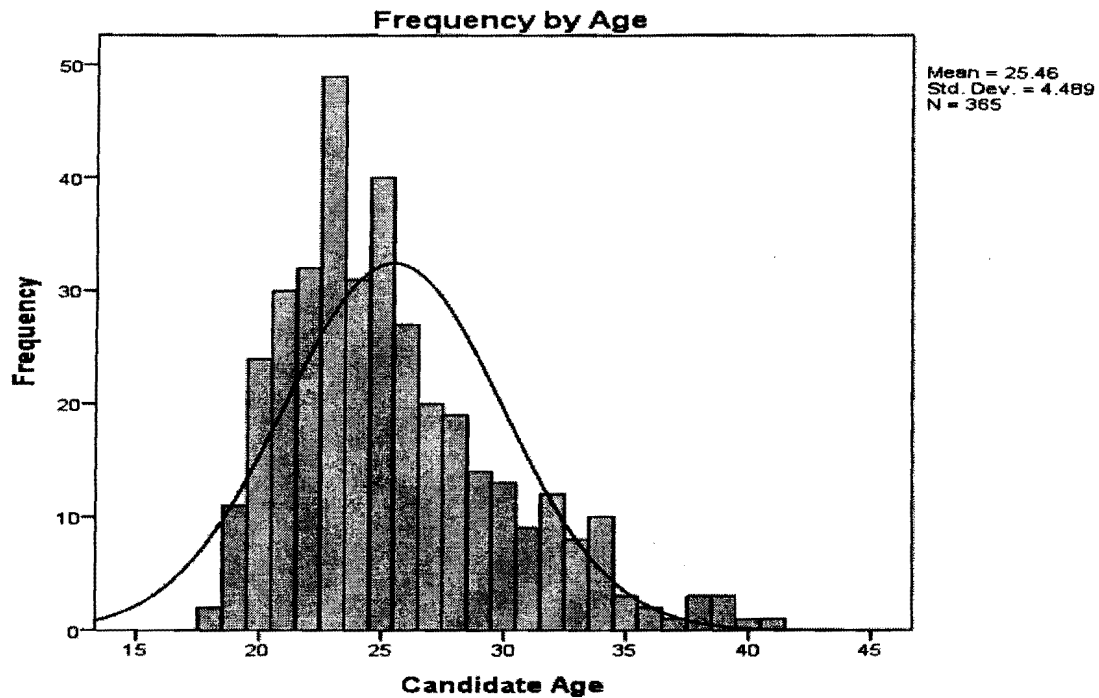
Figure 3. Frequency distribution of participants (*n* = 365) in the study by age.

Appendix B provides a descriptive review of exam scores based on age. As indicated in Table 4, a comparison of the mean scores based on age was conducted utilizing a one way analysis of variance (ANOVA) with a 95% level of confidence as the alpha or level of significance was set at .05 ($\alpha \leq .05$). Since $F = 1.081$ and $p = .364$, the one way ANOVA revealed the main effect of age was not statistically significant ($F = 1.081$, $df = 23, 341$, $p = .364$).

Table 4

One-way Analysis of Variance (ANOVA) between Examination Scores of Participants in the Sample on the 2010 LEAB ™ and the Age of the Participants

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	817.870	23	35.560	1.081	.364
Within Groups	11214.531	341	32.887		
Total	12032.401	364			

Race (White/Non-White)

The original archival data related to race specifically identified each participant as white, Hispanic, Black, or Asian. The data, as provided in the Microsoft Excel™ spreadsheet were entered into IBM SPSS Version 19™ by this researcher and operationalized as either White or non-White (0,1). The 284 participants listed as White ($n = 284$) and the 9 participants listed as Asian ($n = 9$) were aggregated and then dichotomously coded in IBM SPSS Version 19™ as White (0) as opposed to non-White (1). The 11 participants listed as Black ($n = 11$) and the 61 participants listed as Hispanic ($n = 61$) were aggregated and dichotomously coded as non-White (1) as opposed to White (0). The binomial approach to operationalizing the race variable involved the aggregation of the aforementioned race classifications resulting in 293 participants coded as (0) to represent White ($n = 293$) and 72 participants coded as (1) to represent non-White ($n = 72$). This sample is comprised of 19.7% non-White participants and 80.3%

White participants. The 2010 United States Census Bureau data indicate that 13.7% of

the population in New Jersey was Black or African American while 17.7% of the overall

population in New Jersey was Hispanic or Latino (U.S. Census Bureau, 2011). The

United States Census Bureau data do not account for what percentage of Black residents

of New Jersey are also considered Hispanic. The aggregation of Black or Hispanic as

non-White in this study appropriately accounted for any possible overlap in race

classification.

Table 5

Descriptive Statistics Related to Race and the 2010 LEAB™ Examination Scores from the Sample (n=365)

Scores Based on Race

	N	Mean	Std. Deviation	Std. Error
White	293	92.9308	5.51847	.32239
Non-White	72	90.7187	6.34365	.74761
Total	365	92.4944	5.74944	.30094

As indicated in Table 5, a descriptive analysis of the LEAB™ exam scores from

the sample population based on race revealed the mean score for White candidates ($n =$

293) was 92.93 and the mean score for non-White candidates ($n = 72$) was 90.72

establishing a mean difference of 2.21 points. As indicated in Table 6, a comparison of

the mean scores based on race was conducted utilizing an independent samples t-test with

a 95% level of confidence as the alpha or level of significance was set at .05 ($\alpha \leq .05$).

The independent samples t-test was conducted with three basic assumptions: the

dependent variable (examination scores) was normally distributed; the two groups

(White/non-White) had approximate equality of variance; and the two groups

(White/non-White) were independent of one another. A Levene's Test was conducted to

verify the assumption there was equal variance between the samples. As indicated in

Table 6, with the alpha set at .05, the level of significance in the Levene's Test was .068,

therefore verifying the assumption of equality of variance in the samples. Through the

use of a nondirectional, independent samples t-test with a critical t value of ± 1.96, the

mean difference of 2.21 points was found to be statistically significant ($t = 2.96$, $df = 1$,

363, $p < .003$). Based on the results of the t-test, White participants in the sample tended

to score 2.21 points on average higher than non-Whites on the examination.

Table 6

Output from an Independent Samples t-test Conducted Regarding Race and the 2010
LEAB™ Examination Scores from the Sample (n = 365)

Independent Samples t-Test of Examination Scores Based on Race

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Exam Score	Equal variances assumed	3.350	.068	2.956	363	.003	2.21203	.74835	.74039	3.68368
	Equal variances not assumed			2.717	99.029	.008	2.21203	.81416	.59658	3.82749

Gender (Male/Female)

The original, categorical data related to gender, as provided in the Microsoft Excel™ spreadsheet, specifically identified each participant as within a category of either male or female. The data from the original file were entered into IBM SPSS Version 19™ by this researcher and operationalized as either male (0) or female (1). The 302 participants listed as male (*n* = 302) were entered in IBM SPSS Version 19™ as (0) to represent male, while the 63 participants listed as female (*n* = 63) were entered as (1) to represent female. The binomial approach through dichotomous coding of the gender variable was effected to provide the qualitative data with a quantitative value for inclusion in the simultaneous, multiple, linear regression model. This sample of 365 participants is comprised of 83% males and 17% females. According to the 2010 United States Census Bureau (2011), 48.7% of the population in New Jersey was male, while 51.3% of the population in New Jersey was female.

Table 7

Descriptive Statistics Related to Gender and the 2010 LEAB™ Examination Scores from the Sample (n = 365)

Scores based on Gender

	Female	N	Mean	Std. Deviation	Std. Error Mean
Exam Score	Male	302	92.4368	5.84915	.33658
	Female	63	92.7708	5.28022	.66524

As indicated in Table 7, a descriptive analysis of exam scores based on gender revealed the mean score for female candidates (*n* = 63) was 92.77 and the mean score

for male candidates (*n* = 302) was 92.44, establishing a mean difference of .334 points.
As indicated in Table 8, a comparison of the mean scores based on gender was
conducted utilizing an independent samples *t*-test with a 95% level of confidence as the
alpha or level of significance was set at .05 ($\alpha \leq .05$). A Levene's Test was conducted to
verify the assumption that there was equal variance between the samples. As indicated
in Table 8, with the alpha set at .05, the level of significance in the Levene's Test was
.542, therefore verifying the assumption of equality of variance in the samples. Through
the use of a non-directional, independent samples *t*-test with a critical *t* value of ±1.96,
the mean difference of .334 points was found not to be statistically significant (*t* = -.419,
df = 1, 363, *p* < .675). Based on the results of the *t*-test, there is no statistically
significant difference in mean scores in the sample based on the gender of the
participant.

Table 8

*Output from an Independent Samples t-test Conducted Regarding Gender and the 2010
LEAB ™ Examination Scores from the Sample (n = 365).*

Independent Samples *t*-Test Based on Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
									Lower	Upper
Exam Score	Equal variances assumed	.372	.542	-.419	363	.675	.33401	.79724	-1.9018	1.23379
	Equal variances not assumed			-.448	96.502	.655	.33401	.74554	-1.8128	1.14579

Independent Variables/Bivariate Correlations

To address potential multicollinearity issues, a bivariate, correlation matrix (Appendix A) was produced utilizing IBM SPSS Version 19™. At the bivariate level, each predictor variable was assessed in relation to the other predictor variables to identify the existence of very strong correlations between any two variables. Strong correlations at the bivariate level are indicative of multicollinearity between independent variables and required thorough examination. Evidence of potential multicollinearity would have indicated the need to either aggregate or omit the variable(s) of concern, while the absence of multicollinearity would allow for the entry of predictor variables into the regression model.

The alpha or level of significance was set at .05 for the non-directional, bivariate correlation analysis ($\propto \leq .05$). Utilizing IBM SPSS Version 19™, each of the independent/predictor variables was entered into the equation for the bivariate analysis. As indicated in Appendix A, the only statistically significant correlation between the predictor variables was with female participants and an associate's degree earned as the highest level of education achieved. The descriptive data indicate that of the 63 female participants ($n = 63$), 29 reported their highest level of completed education as a high school diploma or GED ($n = 29$), 5 female participants reported their highest level of completed education as an associate's degree ($n = 5$), and 29 female participants reported a bachelor's degree or master's degree ($n = 29$) as the highest level of education completed. Overall, within the convenience sample of male and female participants who attended the private, profession development company's exam preparation course, 68

participants ($n = 68$) reported earning an associate's degree as the highest level of

educational attainment, meaning that 63 of the participants who earned an associate's

degree were males ($n = 63$) and only 5 were females ($n = 5$). Based on the data, only 3%

of the 63 females ($n = 63$) in the sample earned an associate's degree while 21% of the

302 males ($n = 302$) in the sample earned an associate's degree. The Pearson Product-

Moment Correlation Coefficient for the variables female and associate's degree was -

.125 at a .016 level of significance ($r = -.125$, $n = 365$, $p < .016$). Overall, there is a

weak, negative relationship between female candidates in the sample and the attainment

of an associate's degree as the highest level of education completed. Based on the lack

of statistical significance in the relationship between all other independent variables and

the weak correlation between the female variable and the associate's degree variable,

multicollinearity was found not to be a concern in the regression model.

Regression Analysis

Within IBM SPSS Version 19™, the "enter" method was utilized to conduct

simultaneous, multiple, linear regression analysis. The regression model included the

predictor variables: age, gender (0,1), race (0,1), associate's degree (0,1), and bachelor's

degree/master's degree (0,1), while the criterion or outcome variable of the model was

derived from the specific score each of the 365 participants achieved on the 2010 Law

Enforcement Aptitude Battery (LEAB)™. The achievement of a high school diploma or

a GED was accounted for as an independent variable through the dummy code (0)

within IBM SPSS Version 19™. While the respective level of higher educational

attainment was dichotomously coded as described, high school diploma or a GED as the

baseline level of educational attainment served as the reference variable and therefore

was not entered directly into the model.

A simultaneous, multiple, linear regression model was executed, and with a 95%

level of confidence as the alpha or level of significance was set at .05 ($\alpha \leq .05$), the

model was found not to be statistically significant. Since $F = 2.112$ and $p = .063$, the

ANOVA Table (Table 9) revealed the regression equation was not statistically

significant ($F = 2.112$, $df = 5, 359$, $p = .063$). The lack of statistical significance in the

regression model indicated the independent variables, inclusive of the participants' level

of educational attainment, were no better predictors of outcomes on the entry level law

enforcement examination than simply utilizing the mean score of the sample.

Table 9

ANOVA Table for the Simultaneous, Multiple, Linear Regression Equation

ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	343.862	5	68.772	2.112	.063[a]
	Residual	11688.540	359	32.559		
	Total	12032.401	364			

[a] Predictors: (Constant), bachelors degree or masters, non-White, candidate age, female, associate's degree
[b] Dependent variable: Exam score.

A review of the model summary (Table 10), specifically the Adjusted R Squared,

revealed the effect size as the proportionate reduction in error of the model only had a

.015 value. The very low value indicated that even if the model was found to be

statistically significant, only 1.5% of the variance in the criterion variable was explained

by the variance in the predictor variables within the regression model. The Adjusted R

Squared statistic is utilized in simultaneous, multiple, linear regression rather than the R

Squared statistic, as the Adjusted R Squared accounts for the number of independent

variables included in the model (Leech et al., 2011). This model, including the predictor

variables of age, gender, race, and highest level of educational attainment, even if

statistically significant, failed to explain 98.5% of the variance in the criterion variable

(Adjusted R^2 = .015, df = 5, 359, $p \leq$ .063).

Table 10

Model Summary for the Simultaneous, Multiple, Linear Regression Equation

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.169[a]	.029	.015	5.70601

[a] Predictors: (Constant), bachelor's degree or master's, non-White, candidate age, female, associate's degree. [b] Dependent variable: Exam score.

If the model was statistically significant, the coefficients table (Table 11) would

have been utilized to assess the unstandardized beta, t-statistic, and the level of

significance (p value) for each of the independent variables in the model. A coefficients

table provides information related to each predictor variable's influence on the

outcome/criterion variable in the model.

This analysis is accomplished through the assessment of the particular statistics

associated with each independent variable in the table. Further reinforcing the lack of

significance in the model, with the exception of race, each of the predictor variables:

age, gender, and level of education, were found not to be significant predictors of the

examination outcomes. Due to the lack of significance as determined by the statistics

within the ANOVA Table (Table 9), the significance found in race as a predictor cannot

be considered further within this regression model ($b = -2.19$, $t = -2.884$, $p < .004$).

Table 11

Coefficients Table for the Simultaneous, Multiple, Linear Regression Equation

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	93.043	1.731		53.737	.000	89.638	96.448		
Candidate Age	-.018	.067	-.014	-.271	.786	-.151	.114	.976	1.024
Female	.460	.803	.030	.573	.567	-1.119	2.039	.969	1.032
Non-White	-2.190	.759	-.152	-2.884	.004	-3.683	-.697	.971	1.023
Associate Degree	.007	.833	.000	.008	.994	-1.631	1.645	.848	1.179
Bachelor's Degree or Master's Degree	.737	.671	.062	1.098	.273	-.583	2.056	.856	1.169

[a] Dependent variable: Exam score.

V. Findings, Conclusions, and Recommendations

Introduction

The breadth and scope of this study was narrowed to explain the influence of

higher educational attainment on entry level law enforcement examination outcomes.

This academic endeavor was undertaken with a focus on understanding the most

efficient and effective steps in which a prospective law enforcement candidate should

engage when aspiring to begin a career in law enforcement. Given the limited

opportunities and the very competitive testing environment in New Jersey,

understanding what variables influence outcomes on the Law Enforcement Aptitude

Battery (LEAB)™ as administered by the New Jersey Civil Service Commission should

prove important not only to those who aspire to a career in law enforcement but also

those who advise and recruit law enforcement candidates. From the high school

guidance counselor or college advisor to the recruiting officials within New Jersey law

enforcement agencies, information regarding the entry level testing and hiring process is

a substantial component necessary for proper advisement of prospective law

enforcement candidates. The findings of this study serve as additional information to be

considered and explored further by those in the field.

Findings and Conclusions

The simultaneous, multiple, linear regression analysis completed utilizing IBM

SPSS Version 19™ yielded results indicating the absence of statistical significance in

the model as listed in the ANOVA Table (Table 9) when the variables gender, race, age,

associate's degree, and bachelor's or master's degree were included in the equation.

The data-set in this study does not demonstrate sufficient evidence against the null

hypothesis. A hypothesis is based on "conjecture about one or more population

parameters . . . [and the null hypothesis is] the hypothesis to be tested" (Hinkle et al.,

2003). The null hypothesis is what is being accepted or rejected. According to Witte &

Witte (2004), most researchers hope the findings in their study allow for the rejection of

the null hypothesis in favor of an alternate hypothesis. "Although we cannot eliminate

the possibility of making an error in hypothesis testing" (Hinkle et al., 2003), and the

possibility of a Type II error always exists, the data indicate a failure to reject the null

hypothesis. As such, this researcher concluded law enforcement candidates who

completed a higher education degree did not score significantly higher or lower on the

multiple-choice Law Enforcement Aptitude Battery (LEAB)™ than law enforcement

candidates who have not completed a higher education degree when all of the

candidates were exposed to the same study and test-taking strategies prior to the

administration of the examination. The data in this study does not support a belief that

as one increases his or her level of higher education through the completion of a college

degree or degrees, he or she will predicatively score higher on the Law Enforcement

Aptitude Battery (LEAB)™, provided that each of the candidates attended a formal,

two-day examination preparatory program prior to the examination.

"The scientific approach is so skeptical that researchers doubt the validity of their

own work, even when they know they have sincerely tried to do their best" (Nolan et al.,

2008, p. 268). The absence of a relationship between the independent variables and the

outcome variable is likely a product of a combination of confounding influences. Given

the failure to reject the null hypothesis and the potential for a Type II error in this research, each of the potentially confounding influences will be explored and explained for future consideration.

Potentially Confounding Influences

First and foremost, this researcher was unable to account for the influence of the design and construct of the instrument utilized to produce the outcome variable. The instrument itself may have fulfilled its designed intent in producing results that are not influenced by a person's age, gender, race, or level of formal education. According to EB Jacobs (2009), the LEAB™ was developed based on a comprehensive job analysis to measure the essential "knowledge, skills, abilities, and personal characteristics (KSAPs) that are a prerequisite to task performance" (p. 10). The evolution of entry level law enforcement competitive testing has consistently progressed from a historical focus on cognitive-based testing to psychometric designs heavily weighted with non-cognitive components. The current examination under review, the Law Enforcement Aptitude Battery (LEAB)™, contained two alternative forms of competitive assessment: a normal, non-psychopathological personality assessment and a biodata/life experience survey. The industrial-organizational psychologists of the EB Jacobs Corporation developed the three-factor assessment with a multiple-choice construct involving a 48 item, cognitive (written abilities) section, a 103-item normal personality assessment (workstyles questionnaire), and a 68-item biodata (life experience) survey. Most notably, two of the three factors or sections of the test are non-cognitive by design, leaving only the 48 item, written abilities section as the sole assessment of a candidate's

cognitive abilities. The cognitive portion of the examination was specifically designed to test the following abilities: written comprehension, problem sensitivity, inductive reasoning, deductive reasoning, written expression, and information ordering (EB Jacobs, 2009).

Notably, the three-factor Law Enforcement Aptitude Battery (LEAB)™ also assessed "certain motivational, value-related, and attitudinal characteristics" as well as the candidate's "past history and performance" as deemed to be potentially relevant to performance in the field of law enforcement (EB Jacobs, 2010, p. 1). Essentially, the Law Enforcement Aptitude Battery (LEAB)™ consisted of three independent instruments brought together to form a single, three-factor examination to provide a comprehensive assessment of the prospective law enforcement candidate. According to EB Jacobs (2009):

> Each of these instruments is matched to job requirements and each
> assesses a variety of underlying characteristics important in the
> performance of the duties and responsibilities of law enforcement
> officers. With respect to cognitive abilities, we [at EB Jacobs] measure
> candidates' ability to detect problems, use language for both giving and
> receiving information, order events, and think logically. On the
> workstyles and biodata measures, we [at EB Jacobs] are looking for
> individuals who can be depended upon to perform their jobs in a
> conscientious manner, approach their jobs with care and concern, are

motivated and willing to assume a leadership role, and relate well to others (p. 7).

The basic premise behind the use of the personality assessment component centers on the proposition that successful, incumbent law enforcement officers in the field consistently demonstrate the possession of certain personality traits and characteristics found to be important to the responsibilities of a law enforcement officer. Dimensions and factors such as a successful police officer's level of extroversion, conscientiousness, integrity, or motivation, etc., have been measured and incorporated into the scoring solutions for the LEAB™ by the industrial-organizational psychologists of the EB Jacobs Corporation. This type of assessment focuses on the innate and intrinsic qualities of an individual and therefore may be uninfluenced by an individual's educational attainment.

The biodata analysis conducted through the life experience survey component of the LEAB™ is centered on the premise that a person's past history is the best predictor of how he or she will perform in the future. According to EB Jacobs (2009), the life experience survey "is designed to tap seven characteristics: attendance, carefulness, dependability, integrity, interpersonal relations/demeanor, motivation, and validity" (p. 15). As with the non-cognitive, personality component, this section of the LEAB™ may primarily, by design, be assessing and scoring innate and intrinsic qualities which may remain uninfluenced by higher educational attainment.

Therefore, the non-cognitive design of the LEAB™ and its reliance on the psychometric test components of normal, non-psychopathological personality

assessment and biodata analysis may have greatly confounded the influence of the

independent variables in this study on the criterion variable. The heavily weighted, non-

cognitive design of the LEAB™ may thereby have contributed to the lack of statistical

significance in the regression model.

Beyond the concerns related to the construct and design of the LEAB™, the

potential for the confounding influence of self-selection bias (Kenny et al., 1979) cannot

be overlooked in the results of this study. The lack of random sampling and the reliance

upon archival data obtained from participants who self-selected into a formal

examination preparatory course may have substantially contributed to the lack of

significance in the regression model. The possibility exists that those candidates who

have only completed a high school diploma, yet made the conscious decision to spend

the time, energy, and money to attend a formal exam preparation program may actually

be among the higher academic performers. Conversely, those candidates who have

completed a bachelor's degree or master's degree, yet feel the need to attend a formal

exam preparation program, may actually be among the lower academic performers.

Since no data, such as high school GPA or SAT scores, were available to account for the

prior academic performance of participants in this study, self-selection bias remains a

substantial concern.

This phenomenon may also extend to the proposition that in the state of New

Jersey, with the absence of higher education hiring standards at entry level as well as

promotional level, one could reason that even high academic performers do not concern

themselves with the completion of a college degree prior to entering the field.

Conversely, those candidates who have completed a bachelor's degree or a master's

degree and subsequently look to enter the field of law enforcement at the entry level may be among the lower academic performers. This is logically based on the conspicuous absence of hiring standards not only at the entry level but also as one seeks to advance through promotion to rank positions. It is notable that of the 365 participants ($n = 365$) in this study, 127 (35%) of the participants ($n = 127$) reported having some college but had not completed an associate's degree, bachelor's degree, nor master's degree.

An additional contributory factor worthy of note is the minimum age requirement for admission to the examination. Given the eligibility requirement of 18 years of age and the basic understanding that the age of a college graduate completing a four-year degree is commonly age 22 or 23, many of the participants in the study were simply not of age to have reasonably completed a bachelor's degree or master's degree. The sample data revealed 148 (41%) of the participants ($n = 148$) in the study were age 23 or less. Again, the possibility exists that the participants who self-selected themselves into the formal examination preparatory program may be among the higher academic performers despite not completing a college degree. The lack of degree completion for the 127 participants in the sample may simply be due to the young age of the participants and not reflective of their desire nor intent to complete a degree. Similarly, the lack of degree completion is not an indicator of their level of academic performance or ability.

Another potentially confounding influence may have unintentionally occurred as a result of the purposeful element of utilizing only participants who attended a two-day,

formal, examination preparatory program prior to being admitted to the 2010 LEAB™.

As an unintended consequence and the opposite of what was intended, controlling for

exam preparation or coaching may have resulted in a confounding influence within this

study. The professional development training company administered the program to

prepare aspiring law enforcement candidates for the examination. Given the focused

approach to the training and the likelihood that candidates developed a greater

understanding of the testing format, experienced a reduction in test anxiety, and

enhanced the particular skills being tested, the preparation course may have provided a

practice effect benefit (Gatewood et al., 2011), which in a sense may have leveled the

playing field. The formal examination preparation program may have provided

candidates with the necessary knowledge, skills, and abilities (KSAs) to perform well on

the 2010 LEAB™ regardless of higher educational attainment.

Moreover, according to Gatewood et al. (2011), prospective law enforcement

candidates tend to sit for the entry level examinations several times before scoring high

enough to be considered for employment. Therefore, the practice effect benefit gained

through multiple attempts at the same type of examination may have also influenced

outcomes regardless of higher educational attainment. Although the examination

development company writes new versions of the examination for each cycle of test

administration, the types of questions and the skills needed to answer them accurately

remain the same. This study did not control nor account for how many times each

participant attempted the LEAB™ prior to the 2010 administration of the examination.

Policy Implications and Recommendations

Considering the basic premise of production-function theory as a concern, the analysis of the relationship of the predictor and outcome variables in this study provided insight that may prove useful for high school and college career counselors. The conventional belief may exist among career counselors that a high school student aspiring to a career in law enforcement should forego attempting the entry level law enforcement examination until after completing a college degree. Based on the research, the most advantageous approach may prove to be encouraging aspiring law enforcement candidates to make every effort to sit for the entry level examination before, during, and after attending college. This approach is important, as an unintended disservice may be directed at high school seniors who are eligible for the examination during a testing cycle, yet believe they should wait until they have completed a college degree. As indicated in the literature, most law enforcement agencies in the United States currently do not have educational hiring standards beyond the possession of a high school diploma or GED (Bruns, 2010). Therefore, current career and guidance counselors in high schools advising students who indicate they are interested in pursuing a career in law enforcement should thoroughly inform students of the law enforcement hiring process commonly utilized by police departments. Given the limited qualification requirements for admission to the examination, high school students should be advised to apply for the examination upon reaching the eligibility requirements rather than deferring opportunities to take the examination until completing a college degree. Such an approach is further supported by the practice

effect that may occur in each subsequent attempt at the examination (Gatewood et al., 2011; Nolan et al., 2008).

Apart from those high school students who are fortunate enough to directly enter college immediately upon the completion of high school, candidates who enter law enforcement without a college degree should be encouraged to continue higher education while working within the career field. Law enforcement agencies should promote continuing education for agency members inclusive of college tuition incentives and earned credit incentives. While the evidence in this study did not support rejecting the null hypothesis, it is important to continue to recognize the positive impact of higher education on officers in the field including improved communication skills and acceptance of change among other critical skills (Vodicka, 1994). Law enforcement leaders and managers hold a responsibility inherent in their positions to continually promote the personal growth of their personnel (Swanson, et al., 2005).

Higher education administrators should consider the development and inclusion of a course or courses within the college curriculum to address entry level law enforcement examination performance. Tremendous emphasis is placed on written, multiple-choice examinations in entry level law enforcement hiring throughout this country. Given the importance placed on the examination itself as well as the continuing evolution of entry level testing toward multi-factor designs, efforts should be undertaken to acclimate students in higher education criminal justice programs to the testing process. A course designed to address the examination process and multiple-choice exam preparation may serve to improve the likelihood a criminal justice program

graduate will successfully enter the field of law enforcement and utilize the valuable knowledge gained through the college curriculum.

From a policy perspective, a legitimate case may be supported for the use of a selection instrument that accounts for educational attainment rather than potentially discounting higher education. Law enforcement is a demanding field which requires the ability to quickly apply retained knowledge, engage in problem solving, and employ the ability to synthesize multiple considerations to reach the most appropriate and constructive decisions. Critical thinking has become increasingly important to policing, given the complexities of our modern society. Therefore, due consideration should seriously be given to the development and administration of a selection instrument designed to assess a candidate's ability to solve problems and engage in critical thinking. The most notable form of assessment available would involve formal written responses to complex scenarios provided in written, audio, or video format. Given the need for a police officer to work through facts in often complex and confusing incidents and properly prepare formal written reports, it would appear that such a format would not only be facially valid, but would be job-related as well. The use of such a format would also allow college graduates to apply the enhanced knowledge, skills, and abilities gained through their higher educational experience.

Recommendations for Further Research

This study utilized participant biographical data gathered from students who attended a two-day, sixteen hour formal preparatory course specifically designed for the Law Enforcement Aptitude Battery (LEAB) ™. Additional research is necessary to

· assess whether, absent formal exam preparation, higher educational attainment has a statistically significant influence on outcomes on the Law Enforcement Aptitude Battery (LEAB)™ as administered by the New Jersey Civil Service Commission (NJCSC) under the title of the New Jersey Entry Level Law Enforcement Examination (LEE). Since the inclusion of formal examination preparation may have nullified or substantially affected the influence of higher education on examination outcomes, or in a sense, leveled the playing field for test-takers, relevant research should be conducted to explain the influence of higher educational attainment on LEAB™ outcomes absent formal exam preparation. Following the research design utilized herein, this study should be replicated with a simple random sample drawn from the total population of candidates who are admitted to the LEAB™ regardless of whether they attended a formal examination preparatory course.

While the utilization of a convenience sample was purposeful to control for formal exam preparation as a potentially confounding variable, the findings of this study may very well have been greatly influenced by the self-selection of candidates into the preparation course. Considering the concern of self-selection bias, further research which excludes attendance in an exam preparation program as a prerequisite to participation in the study is recommended. Given the proliferation of formal, exam preparation programs, the researcher may control for coaching, preparation, and/or the use of specific study and test-taking strategies by developing a comprehensive survey to distribute to the random sample of participants. The data collected in the survey may then be utilized to develop a variable to operationalize exam preparation or coaching to

account for those candidates in the sample who attended a formal test preparation program. This research would require either the direct participation of the New Jersey Civil Service Commission to provide access to candidate contact information or access to the candidates briefly at the test sites. Exit interviews of candidates at the test sites may provide for an adequate random sample.

Although entry level law enforcement examinations are produced by independent, for profit corporations and varying civil service departments throughout the United States, there has been a consistent trend toward multi-factor examinations. Psychometric assessment beyond the traditional norm of cognitive-based, multiple-choice, testing commonly includes factors such as non-psychopathological, normal personality assessment as well as biodata assessment. Given the sophisticated construct of these assessment instruments produced by specially trained industrial-organizational psychologists, the possibility must be addressed that the instrument itself may effectively reduce the influence of the variables commonly associated with examination outcomes. Simply stated, further research is recommended to assess whether the Law Enforcement Assessment Battery (LEAB)™ effectively nullifies higher educational attainment as an influence in examination outcomes. The current construct of the LEAB™ includes non-cognitive assessment as two-thirds of the instrument. The multiple-choice construct of the assessment involves a 48 item, cognitive (written abilities) section; a 103 item normal personality assessment (workstyles questionnaire); and a 68 item biodata (life experience) survey.

The Law Enforcement Aptitude Battery (LEAB)™ as produced by the EB Jacobs Corporation may have served as the confounding influence nullifying the potential influence of higher educational attainment on examination outcomes. Further research is necessary to determine the interaction effect of the three-factor psychometric construct of the LEAB™ on biographical variables of candidates admitted to the examination process. According to EB Jacobs (2009), "both content and criterion-related strategies were employed to account for test validation relying on a comprehensive job analysis . . ." (p. 10). Considering the sophisticated construct and the company's desire to minimize any disparate impact on a protected class of candidates, there is a rational basis for concern that the instrument may control for and effectively nullify the influence of higher educational attainment on examination outcomes. The research should most logically involve an independent assessment of the three separate sections of the LEAB™ to determine the relationship between the outcomes on each section and each participant's level of educational attainment. The inquiry would provide insight regarding the influence of higher educational attainment on the two non-cognitive components of the examination as compared to the singular cognitive component.

Further research is necessary to determine if self-selection bias influenced the results of this study. This research should be replicated with the addition of factors to reduce the likelihood of confounding influences affecting the results of the study. Ideally, random selection should be utilized to gather a larger sample to allow for a greater number of participants in each category of higher education. The larger sample

would allow for sufficient participants to establish the levels of higher education completed as follows: (1) GED only, (2) high school only, (3) high school or GED plus some college but no degree earned, (4) associate's degree earned, (5) bachelor's degree, and (6) master's degree. The most important addition to the replicated study would be the collection of participant data related to a universal and independent measure of academic competence and performance achieved prior to the participant sitting for the law enforcement examination. Given the levels of education being assessed, the most useful, universal academic measure would be each participant's high school grade point average (GPA). The assessment could then be performed to determine if self-selection bias truly affected the results of the study. The additional data would allow for an assessment of prior academic performance as compared to each participant's corresponding level of higher educational attainment and ultimately each participant's corresponding LEAB™ outcome.

The optimal research design regarding the New Jersey Entry Level Law Enforcement Examination (LEE), whether the LEAB™ or a similar, multi-factor selection instrument, would require the assistance and participation of the New Jersey Civil Service Commission. Currently, the State of New Jersey greatly limits public access to records related to civil service testing. For instance, current research data is limited to only those participants who achieve a passing score on the examination. The names of the participants who fail to meet the minimum standards (cut-off score) established for the examination are protected from public review. Likewise, pursuant to N.J.S.A. 47:1A-1 et seq., basic biographical data collected by the New Jersey Civil

Service Commission is protected and not released to the public. The New Jersey Civil

Service Commission commonly collects the following biographical data from each

candidate who applies and subsequently sits for the Entry Level Law Enforcement

Examination (LEE): full name, street address, city (jurisdiction), state, social security

number, veteran's status, race (Black, White, Hispanic, Asian, American Indian or

Alaskan Native), bilingual status (Spanish, Korean, or Spanish/Portuguese/English),

ADA assistance needed, citizenship, gender, date of birth (age), and highest level of

diploma or degree completed. The only information released by the New Jersey Civil

Service Commission was for candidates who passed the examination and was limited to

the following: candidate's full name, veteran's status, city (jurisdiction), and passing

examination outcome. For substantial biographical data to be obtained, the researcher

must collect it directly from essentially unidentifiable candidates or through another

source, such as a private training company as in this study. Clearly, the records from a

private business are most often not available to the public for research purposes.

Therefore, for further substantive research to be conducted, it is incumbent upon the

State of New Jersey to make available the necessary data. Such data can be released

consistent with existing law, provided the releasing authority employs acceptable

methods to code the data to maintain the anonymity of the applicants. Clearly, a

representative of state government could replace an applicant's name with a case

number when releasing the data to ensure anonymity.

In addition to the studies described, further research is recommended to explain

the influence of the number of years a candidate is out of school on entry level law

enforcement examination outcomes. While this study investigated the relationship between higher educational attainment, focusing on degree completion, the research design did not account for the influence of when the degree was earned in relation to when the examination was administered. The number of years a candidate has been away from formal schooling may have an influence on the candidate's performance on the entry level law enforcement examination.

Similarly, the data being assessed may include whether the candidate attended college as a full-time student or part-time while working. A further distinction may be drawn regarding the attendance of college locally while living at home compared to attending college away from home. Information beyond simply the earning of a degree may provide clearer insight into the relationship between higher educational attainment and entry level law enforcement examination outcomes.

Information available in the archival data obtained for this study included the type of degree earned by the participant in terms of an associate of science degree rather than an associate of arts degree or a bachelor of science degree rather than a bachelor of arts degree. A strong basis for drawing a substantive distinction between the types of degree would need to be founded in literature and research. This particular research would be dependent upon the existence of substantial literature and research to state how the curriculum and learning outcomes in an associate or bachelor of science degree differs from the curriculum and learning outcomes of an associate or bachelor of arts degree. Provided that a distinction is supported in the literature, the influence of the

type of degree earned on LEAB™ examination outcomes may be investigated through simultaneous, multiple, linear regression analysis.

Beyond the focus on entry level law enforcement, further research should be conducted to investigate the relationship between higher education and promotional examination outcomes, including the variable of formal exam preparation in the model. Substantial research and literature support, in significant part, establishing higher education standards in law enforcement. Clearly, such standards may be at the entry level as a basic hiring eligibility requirement, or at the positions of rank within a police department through imposing higher education standards as a prerequisite for admission to promotional examinations. Through simultaneous, multiple, linear regression, a model can be developed to determine the predictive value of higher educational attainment on promotional examination outcomes. As with the entry level candidate data, the New Jersey Civil Service Commission would need to cooperate with the research effort at the promotional level for a substantive study to be conducted. Participant contact information would need to be provided by the New Jersey Civil Service Commission to facilitate the distribution of a comprehensive survey to candidates for voluntary completion. Current rules and procedures preclude such a release of information. Again, the State of New Jersey would need to participate in the research process by facilitating the distribution aspect of the survey process to remain compliant with existing rules and procedures regarding examination applicant confidentiality.

Ultimately, as can be observed in most of the models described, personal level of motivation may be the most influential variable when assessing examination outcomes. As with self-selection bias, the intrinsic level of motivation possessed by an individual may be most determinant of greater outcomes for the individual than any particular academic credential. A recommendation for further research regarding LEAB™ examination outcomes should include a measure of the motivation level of the individual participant. The combination of many of the potential predictor variables discussed herein would provide a more complete and explanatory model in further research.

Summary

While this study endeavored to explain the influence of higher educational attainment on LEAB™ examination outcomes, it also served to provide a basis for future research on the topic. The failure to reject the null hypothesis within this research indicated a lack of support for the proposition that higher educational attainment would have a statistically significant influence on entry level law enforcement examination outcomes when each candidate attended a two-day, examination preparatory course prior to the examination. While not a fully realized study, this research provides ample information for further investigation into the variables that affect LEAB™ outcomes. Future research regarding outcomes on the LEAB™ should account for the potentially confounding influences addressed in this study and involve a much larger sample utilizing random selection. The inclusion of additional independent variables discussed in this section should be employed in further analysis of this topic.

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APPENDICES

Appendix A

Correlations

		Exam Score	Age	Female	Non-White	High School	Associate's Degree	Bachelor's or Master's
Exam Score	Pearson Correlation	1	-.021	.022	-.153**	-.055	-.017	.071
	Sig. (2-tailed)		.691	.675	.003	.297	.742	.179
	Sum of Squares and Cross-products	12032.401	-195.816	17.410	-127.850	-57.078	-14.082	71.160
	Covariance	33.056	-.538	.048	-.351	-.157	-.039	.195
	N	365	365	365	365	365	365	365
Age	Pearson Correlation	-.021	1	.084	.083	-.093	.050	.056
	Sig. (2-tailed)	.691		.109	.115	.077	.343	.289
	Sum of Squares and Cross-products	-195.816	7334.674	52.003	53.860	-75.485	31.701	43.784
	Covariance	-.538	20.150	.143	.148	-.207	.087	.120
	N	365	365	365	365	365	365	365
Female	Pearson Correlation	.022	.084	1	.083	.010	-.125*	.091
	Sig. (2-tailed)	.675	.109		.112	.847	.016	.082
	Sum of Squares and Cross-products	17.410	52.003	52.126	4.573	.693	-6.737	6.044
	Covariance	.048	.143	.143	.013	.002	-.019	.017
	N	365	365	365	365	365	365	365
Non-White	Pearson Correlation	-.153**	.083	.083	1	.092	-.060	-.046
	Sig. (2-tailed)	.003	.115	.112		.079	.250	.378
	Sum of Squares and Cross-products	-127.850	53.860	4.573	57.797	6.649	-3.414	-3.236
	Covariance	-.351	.148	.013	.159	.018	-.009	-.009
	N	365	365	365	365	365	365	365
High School	Pearson Correlation	-.055	-.093	.010	.092	1	-.432**	-.684**
	Sig. (2-tailed)	.297	.077	.847	.079		.000	.000
	Sum of Squares and Cross-products	-57.078	-75.485	.693	6.649	90.312	-30.553	-59.759
	Covariance	-.157	-.207	.002	.018	.248	-.084	-.164
	N	365	365	365	365	365	365	365
Associate Degree	Pearson Correlation	-.017	.050	-.125*	-.060	-.432**	1	-.362**
	Sig. (2-tailed)	.742	.343	.016	.250	.000		.000
	Sum of Squares and Cross-products	-14.082	31.701	-6.737	-3.414	-30.553	55.332	-24.778
	Covariance	-.039	.087	-.019	-.009	-.084	.152	-.068
	N	365	365	365	365	365	365	365
Bachelors or Masters	Pearson Correlation	.071	.056	.091	-.046	-.684**	-.362**	1
	Sig. (2-tailed)	.179	.289	.082	.378	.000	.000	
	Sum of Squares and Cross-products	71.160	43.784	6.044	-3.236	-59.759	-24.778	84.537
	Covariance	.195	.120	.017	-.009	-.164	-.068	.232
	N	365	365	365	365	365	365	365

** Correlation is significant at the 0.01 level (2-tailed).
lation is significant at the 0.05 level (2-tailed)

Appendix B.   **Scores based on Age**

Age	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18	2	84.8250	6.39932	4.52500	27.3294	142.3206	80.30	89.35
19	11	93.7645	4.28430	1.29176	90.8863	96.6428	86.58	98.59
20	24	90.4013	6.43661	1.31387	87.6833	93.1192	75.36	98.61
21	30	94.9720	4.48655	.81913	93.2967	96.6473	80.96	99.85
22	32	92.2584	6.77116	1.19698	89.8172	94.6997	73.77	99.10

Table 2

Descriptive Statistics for the 2010 LEAB ™ Examination Scores from the Sample (n=365)

LEAB™ Score from Sample

N	Valid	365
	Missing	0
Mean		92.4944
Std. Error of Mean		.30094
Median		94.0900
Mode		96.72a
Std. Deviation		5.74944
Range		26.21
Minimum		73.77
Maximum		99.98
Percentiles	25	88.8650
	50	94.0900
	75	97.1300

a Multiple modes exist. The smallest value is shown

Sample of 2010 LEAB™ Scores

Mean = 92.49
Std. Dev. = 5.749
N = 365

Appendix C.   **Frequency of New Jersey 2010 Statewide LEAB™ Scores (N = 18,487)**

Score	Frequency	Cumulative Percent
99.000 to 99.999	675	3.7
98.000 to 98.990	657	7.2
97.000 to 97.990	631	10.6
96.000 to 96.990	655	14.2
95.000 to 95.990	638	17.6
94.000 to 94.990	639	21.1
93.000 to 93.990	649	24.6
92.000 to 92.990	651	28.1
91.000 to 91.990	633	31.5
90.000 to 90.990	628	34.9
89.000 to 89.990	634	38.4
88.000 to 88.990	616	41.7
87.000 to 87.990	613	45.0
86.000 to 86.990	615	48.3
85.000 to 85.990	619	51.7
84.000 to 84.990	615	55.0
83.000 to 83.990	612	58.3
82.000 to 82.990	598	61.5
81.000 to 81.990	629	64.9
80.000 to 80.990	599	68.2
79.000 to 79.990	600	71.4
78.000 to 78.990	621	74.8
77.000 to 77.990	588	78.0
76.000 to 76.990	590	81.2
75.000 to 75.990	621	84.5
74.000 to 74.990	598	87.8
73.000 to 73.990	583	90.9
72.000 to 72.990	580	94.0
71.000 to 71.990	547	97.0
70.000 to 70.990	553	100.0
	18487	100.0

Appendix D.   Coded Data from Sample Population (*n* = 365)

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
1	28	0	0	0	1	95.80
2	24	0	1	0	0	86.73
3	30	0	0	0	0	94.16
4	24	0	1	0	0	93.62
5	32	0	0	0	0	76.86
6	22	0	0	0	1	98.75
7	19	0	0	0	0	92.85
8	33	1	1	0	1	99.98
9	23	0	1	0	1	93.08
10	19	0	0	0	0	92.23
11	40	0	1	1	0	81.57
12	41	0	1	1	0	87.81
13	32	0	1	0	1	83.57
14	23	0	0	1	0	81.65
15	21	0	0	1	0	92.80
16	21	1	0	0	0	88.51
17	28	0	0	0	1	90.24
18	23	0	1	0	1	98.13
19	23	1	0	0	1	96.59
20	23	0	0	0	1	87.09
21	24	0	1	0	0	98.99
22	22	0	0	0	0	99.10
23	27	0	0	0	1	88.74
24	24	0	0	0	0	84.94
25	24	0	0	0	1	94.04
26	38	0	0	0	1	97.20
27	23	0	0	0	1	97.56
28	25	0	0	0	0	82.61
29	24	1	0	0	1	96.86
30	27	0	0	0	0	99.30
31	28	1	0	0	0	87.62
32	25	0	0	0	1	80.49
33	23	0	0	0	0	98.58
34	27	0	0	0	0	95.17

Appendix D.　　　　**Coded Data from Sample Population (*n* = 365)**

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
35	23	0	0	1	0	88.64
36	24	0	0	0	1	78.93
37	33	1	0	0	0	87.83
38	26	0	0	0	1	85.35
39	21	0	0	0	0	91.92
40	22	0	0	0	1	97.40
41	23	1	0	0	1	97.59
42	26	0	1	1	0	79.15
43	20	0	0	0	0	88.13
44	23	0	0	0	0	79.14
45	26	1	0	0	1	99.65
46	26	0	1	0	1	91.56
47	23	0	0	0	1	97.71
48	30	1	1	0	1	95.09
49	27	0	0	0	1	97.44
50	25	0	0	0	1	99.14
51	21	0	0	1	0	91.82
52	22	0	1	0	0	76.41
53	22	0	0	1	0	93.26
54	26	0	1	0	0	96.44
55	34	0	0	0	0	97.11
56	34	1	1	0	0	91.80
57	23	0	0	0	1	91.48
58	24	0	0	0	0	94.31
59	22	0	0	0	1	94.78
60	21	0	1	0	0	98.88
61	34	1	0	1	0	95.92
62	25	0	0	0	1	99.71
63	28	0	0	0	0	99.35
64	25	0	0	0	0	90.58
65	21	0	0	0	0	97.82
66	26	0	0	0	0	95.57
67	33	0	0	1	0	96.97
68	21	0	0	0	1	91.59

Appendix D. **Coded Data from Sample Population (*n* = 365)**

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
69	31	0	0	0	1	99.22
70	24	0	1	1	0	95.58
71	27	1	0	0	0	98.34
72	30	0	0	0	0	88.60
73	30	0	0	1	0	95.91
74	23	0	0	1	0	91.52
75	23	0	0	1	0	98.58
76	19	0	0	0	0	98.15
77	25	0	0	1	0	93.18
78	24	0	0	1	0	88.93
79	21	0	0	1	0	97.18
80	23	1	1	1	0	84.14
81	25	0	0	0	1	81.61
82	22	0	0	0	1	91.90
83	20	1	0	0	0	83.56
84	30	1	1	0	0	91.73
85	21	0	0	0	0	99.11
86	25	0	0	0	1	99.46
87	23	0	0	0	0	91.21
88	32	1	1	0	1	89.05
89	23	0	1	0	0	94.58
90	24	0	0	0	0	98.26
91	22	0	0	0	1	98.89
92	20	1	0	0	0	96.56
93	23	0	0	0	1	95.00
94	21	0	0	1	0	98.20
95	20	0	1	0	0	87.14
96	39	0	0	0	0	85.69
97	32	0	0	0	1	96.37
98	23	1	0	0	1	96.96
99	26	0	0	0	1	95.14
100	28	0	0	0	1	98.05
101	19	0	0	0	0	94.67
102	24	0	0	0	1	97.61

Appendix D.   **Coded Data from Sample Population (*n* = 365)**

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
103	33	0	0	0	0	95.75
104	30	0	0	0	1	92.59
105	25	0	0	0	0	97.38
106	25	1	0	0	1	97.48
107	20	0	1	0	0	75.36
108	27	0	0	1	0	92.32
109	31	1	0	0	0	91.71
110	20	0	1	0	0	82.65
111	24	1	1	0	1	95.58
112	23	0	0	0	1	88.98
113	34	0	1	0	0	98.08
114	34	1	0	0	1	98.76
115	23	1	0	0	1	93.04
116	26	1	1	0	1	89.69
117	28	0	0	0	1	93.93
118	28	0	1	0	1	88.90
119	29	1	0	0	1	90.80
120	26	0	0	0	1	88.21
121	21	0	0	1	0	98.68
122	29	0	0	1	0	93.88
123	21	0	0	0	0	84.93
124	28	1	0	0	1	89.72
125	27	0	0	0	1	87.96
126	25	0	0	0	0	97.08
127	26	0	0	0	1	95.74
128	31	0	1	0	1	91.50
129	23	0	0	0	0	95.46
130	22	0	0	0	0	97.72
131	22	0	0	0	1	92.94
132	22	0	0	0	0	95.06
133	25	0	0	1	0	94.42
134	28	0	0	0	0	91.59
135	23	0	0	0	1	88.80
136	28	0	0	0	0	93.44

Appendix D.   **Coded Data from Sample Population (*n* = 365)**

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
137	23	0	1	0	1	81.47
138	20	1	0	0	0	82.29
139	23	0	0	0	1	89.47
140	23	0	0	0	1	94.82
141	22	0	1	0	1	95.45
142	19	0	0	0	0	95.20
143	23	1	0	0	0	91.52
144	30	0	0	0	1	88.38
145	24	1	1	0	0	96.89
146	29	0	1	0	0	94.91
147	36	1	0	1	0	97.47
148	23	0	0	0	1	95.25
149	24	0	0	0	1	92.07
150	29	0	0	0	0	97.14
151	34	0	0	1	0	81.64
152	26	0	0	0	1	96.72
153	21	0	0	1	0	96.17
154	25	0	0	0	1	84.18
155	25	0	0	0	1	99.01
156	26	0	0	0	1	85.07
157	21	1	0	0	0	93.34
158	20	0	0	0	0	85.21
159	26	0	0	0	1	96.98
160	26	0	0	0	0	82.90
161	20	0	0	0	0	91.90
162	24	0	0	0	0	96.95
163	26	0	0	1	0	94.41
164	27	0	0	0	0	97.68
165	20	0	0	0	0	93.36
166	24	0	0	0	0	76.44
167	25	0	0	1	0	96.58
168	35	0	1	0	0	94.09
169	25	0	0	0	1	96.53
170	24	0	0	0	1	97.08

Appendix D. **Coded Data from Sample Population (*n* = 365)**

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
171	25	0	0	1	0	91.08
172	24	0	0	0	1	98.27
173	26	0	0	1	0	94.59
174	18	1	0	0	0	89.35
175	23	0	0	0	1	86.91
176	25	0	0	0	1	96.46
177	29	0	0	1	0	97.09
178	22	0	0	0	0	89.71
179	21	0	1	0	0	97.72
180	24	0	1	1	0	88.55
181	26	1	0	0	0	99.39
182	20	0	0	1	0	90.24
183	23	1	0	0	1	90.41
184	20	0	0	0	0	93.46
185	23	0	0	0	1	94.64
186	22	0	0	1	0	86.95
187	23	0	0	1	0	92.36
188	25	0	0	1	0	85.51
189	23	0	0	1	0	92.89
190	27	0	0	0	0	82.35
191	20	0	1	0	0	97.22
192	29	0	0	0	1	97.53
193	21	0	0	0	0	96.44
194	23	1	0	1	0	88.33
195	24	0	0	0	1	98.51
196	38	0	0	0	0	93.11
197	32	1	0	0	0	84.53
198	19	1	0	0	0	98.20
199	28	1	0	0	0	96.90
200	27	0	0	1	0	96.88
201	29	0	0	0	1	96.53
202	31	0	0	0	0	92.58
203	25	0	0	0	0	88.21
204	20	0	0	0	0	94.75

Appendix D. **Coded Data from Sample Population (*n* = 365)**

ID	Age	Gender	Race	Associate's Degree	Bachelor's/Master's Degree	LEAB™ Score
205	25	0	0	0	0	79.87
206	20	0	0	0	0	95.65
207	25	0	0	0	1	97.12
208	35	0	0	1	0	95.30
209	22	0	0	1	0	78.00
210	25	0	1	0	0	92.36
211	28	0	0	1	0	87.45
212	19	0	1	0	0	97.16
213	19	0	0	0	0	90.41
214	22	0	0	0	0	73.77
215	29	0	1	0	1	79.45
216	21	0	0	1	0	95.33
217	23	0	0	0	0	98.10
218	28	0	0	0	0	90.83
219	27	0	0	0	0	96.31
220	27	0	1	0	1	81.91
221	39	0	0	0	0	98.30
222	33	1	1	0	0	91.68
223	24	0	0	0	1	91.53
224	21	0	0	0	0	96.72
225	21	0	0	0	0	94.68
226	27	0	0	1	0	96.75
227	25	0	0	1	0	87.50
228	34	0	0	0	0	93.82
229	19	1	0	0	0	86.58
230	31	0	0	0	0	97.27
231	30	0	0	0	0	94.74
232	23	0	0	0	1	92.84
233	20	0	1	0	0	95.77
234	26	0	0	0	1	90.81
235	20	0	0	0	0	93.03
236	25	1	1	0	1	98.53
237	34	1	0	0	1	86.87
238	23	0	0	0	0	95.66