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**THE CONSISTENCY OF THE USE OF THE POLYGRAPH EXAM DURING  
THE SELECTION PROCESS AMONG LAW ENFORCEMENT AGENCIES**

by  
Jessica Rachel Mark

A Thesis

Submitted to the  
Department of Psychology  
College of Science and Mathematics  
In partial fulfillment of the requirement  
For the degree of  
Masters of Arts in School Psychology  
at  
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Thesis Chair: Roberta Dihoff, Ph.D.

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## **Dedication**

*I dedicate this manuscript to my parents, Joyce and Donald Mark*

## Acknowledgments

I would like to express my appreciation to Dr. Roberta Dihoff, Dr. Eleanor Gaer, and Dr. Terri Allen for their guidance throughout this research.

## Abstract

Jessica Rachel Mark

### THE CONSISTENCY OF THE USE OF THE POLYGRAPH EXAM DURING THE SELECTION PROCESS AMONG LAW ENFORCEMENT AGENCIES

2013/14

Roberta Dihoff, Ph.D.

Master of Arts in School Psychology

The current study examined the use of and the consistency of use of the polygraph exam by law enforcement agencies throughout the United States as part of the screening process to find suitable applicants for employment as police officers. The polygraph exam can be a valuable tool for law enforcement agencies to use in screening applicants, but research has shown that there are questions with regard to the validity and the reliability of the polygraph exam and that improvements in the consistency of use and standardization of practices would increase the validity and reliability of the polygraph exam as a screening tool (Kircher & Raskin, 1988; Honts & Amato, 2007). A survey addressing police applicant screening procedures was mailed to the ten largest law enforcement agencies in the United States. Results indicated that the polygraph exam was not standardized or used consistently by the law enforcement agencies throughout the United States in the screening of law enforcement applicants. Seventy percent of the agencies surveyed used the polygraph exam, and 20% of the agencies administered one polygraph exam to each applicant. The type of polygraph instrument used for the polygraph exam was inconsistent among the agencies, and 75% of the agencies disclosed the results of the polygraph exam to the applicant. The current study provided additional information to the available research concerning the law enforcement agency applicant screening process and provided implications and future direction for further investigation.

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## **Chapter 1**

### **Introduction**

The current study focused on the use of the polygraph exam by law enforcement agencies as part of a screening process to select police officers for employment. The polygraph exam has been used since the 1920's to detect lying by measuring physiological changes in a subject who is being questioned (Green & Heilbrum, 2011). There is a lack of standardization in test administration, analysis, and evaluation among law enforcement agencies (Handler, Honts, Krapohl, Nelson, and Griffin, 2009). The polygraph exam can be a valuable tool for law enforcement agencies to use in screening applicants, but research has shown that there are questions with regard to the validity and reliability of the polygraph exam and that improvements in the consistency of use and standardization of practices would increase the validity and reliability of the polygraph exam as a screening tool. This study is relevant because police officers are important to the safety and welfare of society. Fair, accurate, and uniform screening procedures including the use of the polygraph exam are necessary to ensure that the applicants chosen to be police officers are good candidates for the job.

The purpose of this study was to examine the use of the polygraph exam by law enforcement agencies as part of a screening process to find suitable applicants for employment as police officers. This study focused on whether or not the polygraph test is standardized and used consistently by law enforcement agencies. A survey addressing police applicant screening procedures was sent to various law enforcement agencies in the United States. It was hypothesized that polygraph exams are not standardized or used

consistently by selected law enforcement agencies. The study was conducted with regard to the following operational definition:

Polygraph Exam: an instrument used to record changes in physiological responses of blood pressure, respiration and dermal response during questioning. These physiological responses controlled by the autonomic nervous system are evaluated and provide information about whether the subject is providing truthful information (Slavkovic, 2002).

The study was also conducted with regard to the following assumptions. It is assumed that the questions on the survey were answered truthfully by the selected law enforcement agencies and that these agencies were a representative sample of law enforcement agencies in the United States. Limitations of this study included the small sample size, the low response rate of selected law enforcement agencies, and the accuracy of the responses to the survey questions as well as the accuracy of the information obtained from internet law enforcement blogs and websites.

The literature review focused on the history of the polygraph exam, the components of the polygraph exam, and the procedures of administering the polygraph exam and evaluating the polygraph exam results. Next, the literature review focused on problems related to the reliability and the validity of the polygraph exam with particular emphasis on the use of the polygraph exam during the police applicant screening process. Reviewed literature also focused on solutions to the problems with the use of the polygraph exam as a screening tool and how to improve the validity and reliability of the polygraph exam through consistency and standardization of use.

## Chapter 2

### Literature Review

#### Introduction

The literature review presents the history of the controversial polygraph exam, including the legal policies that govern the use of the polygraph exam. Next, the literature review focuses on problems related to reliability and validity of the polygraph exam. Then, the literature review focuses on the procedure of administering and evaluating the polygraph exam including the question techniques and the scoring method. Particular emphasis is placed on the use of the polygraph exam by law enforcement agencies in pre-employment screening of police officers and how this screening procedure lacks standardization.

#### History of the Polygraph Exam

The literal meaning of the word "polygraph" is *many writings* (White, 2001). A polygraph test, more commonly known as a lie detector test, is defined as an instrument that continuously and simultaneously records changes in cardiovascular, respiratory and electrodermal activity ("New Rules," 1988). There is no instrument that measures lying. The changes in the physiological processes that are linked to lying may be occurring in response to some other psychological factor. The polygraph exam measures physiological responses or arousal to certain sets of questions (Lewis & Cuppari, 2009). Polygraphic interrogation is a form of psychological testing based on psychometric theory and psychophysiology (Lykken, 1974).

The polygraph exam has been used since the 1920's to detect lying by measuring physiological changes in a subject who was being questioned (Green & Heilbrum, 2011).

The search for a reliable way to detect deception has a long history. Since the 19th century, a wide variety of lie detecting techniques have been developed as scientists have experimented with instruments to measure deception which they have found to be linked to physiological arousal. Many studies have been done based on the assumption that human deception is linked with nervousness, and that liars would exhibit more nervousness than truth tellers with behaviors such as increased movement or speech errors (Grubin & Madsen, 2005). Even early societies were interested in finding procedures and techniques to detect deception in human beings.

Early societies used various forms of torture to detect deception and thought that deception was linked with emotionality. Some of these early methods to detect deception were of a physical nature and consisted of activities such as holding a human arm under boiling water or putting a hot iron on a human hand (Ford, 2006). Evidence of the use of these methods of detecting deception has been found in ancient Greece, Scandinavia, Iceland, Japan, and Africa (Grubin & Madson, 2005; Candland & Campbell, 1961). The idea that deception is linked with nervousness, emotionality and physiological changes in the human body continued to be investigated in the 19th century.

In the late 19th century, Cesare Lombroso, an Italian criminologist, claimed to be able to detect deception by monitoring changes in blood volume during questioning of a subject using a hydrosphygmomanometer, a crude polygraph. In 1914, Vittorio Benussi, a psychologist, investigated a link between deception and physiological changes such as blood pressure, pulse, and breathing rate (Gordon, 2008). Hugo Munsterberg also investigated the link between physiological changes and deception, and a student of Munsterberg, William Marston invented a deception test based on changes in blood

pressure. Marston got the idea for his deception test by observing his wife whose blood pressure rose when she was angry or excited. Marston reported high positive correlations between lying and changes in systolic blood pressure using his deception test and used his test in criminal proceedings (Grubin & Madsen, 2005).

Marston's deception test was used in a criminal proceeding in which a male named James Frye was accused of robbery and murder. Frye confessed to the crime but later withdrew his confession claiming that he was bribed to confess. Marston's deception test found that Frye was truthful about his innocence, but the judge would not allow Marston's testimony because his deception test was not considered scientific evidence (United States v. Frye, 1924). Frye was actually later exonerated of his crime suggesting the validity of Marston's test (Office of Technology Assessment, 1983). Following the Frye case, the admissibility of deception tests as scientific evidence in court was not questioned again until 1993.

In 1993, the United States Supreme Court provided guidelines for determining the admissibility of evidence such as the deception test in court following *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (Daubert v. Merrell Dow Pharmaceuticals, Inc., 1993). The 1993 United States Supreme Court's decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.* modernized the Frye precedent and required courts to make scientific judgments and apply a broad set of criteria for determining the admissibility of scientific evidence (Saxe & Ben-Shakher, 1999). In the Daubert case, the Supreme Court outlined the test for the admissibility of scientific evidence in federal courts (Faigman, Fiebert, & Stern, 2003). Many federal courts still exclude polygraph evidence because of

high error rates and the lack of standards for administering polygraphs (US v. Cordoba, 1999).

In 1998, the United States Supreme Court ruled against the use of the polygraph as evidence in the case of *United States v. Schaeffer*. An Air Force man accused of using illegal drugs wanted to use a polygraph test to prove his innocence, but the Supreme Court denied his request questioning the reliability of the polygraph (US v. Schaeffer, 1998). Some states in the United States allow polygraph exam results to be admissible in state courts under certain conditions, and some states do not allow the results to be admissible in state courts under any conditions. Federal courts follow a different set of rules regarding the admission of the polygraph exam results into court, and the decision is left to the judge's discretion (LaMance, 2013).

In 1921, John Larson, a police officer with a Ph.D. in physiology, began investigating the link between blood pressure and respiratory changes and deception. He is recognized as having created the first modern polygraph instrument, and his device made paper recordings of blood pressure, pulse rate, and respiration of a subject who was being questioned (Kanable, 2010). Larson used his polygraph instrument for criminology with a question technique later known as the relevant-irrelevant test. The subjects were presented with questions that were related to the crime and questions that were not related to the crime while their physiological changes were recorded. Larson's reasoning was that a guilty subject would exhibit an increased physiological response to the questions related to the crime, but an innocent subject would not exhibit an increased physiological response to the questions related to the crime. Although Larson's polygraph instrument



showed promise, he became skeptical about the accuracy of his results especially when used in court (Grubin & Madson, 2005).

In 1939, following the research by Larson, Leonarde Keeler developed the first portable polygraph instrument that simultaneously recorded pulse rate, blood volume change, and breathing, but he added the recording of skin response to the instrument. Keeler's reasoning was that a deceptive subject would sweat more than an honest subject. The Federal Bureau of Investigation purchased Keeler's instrument, which became the prototype for the modern polygraph and the first polygraph machine used by a police department (Grubin & Madsen, 2005; "Lie Detector," 2013).

In the late 1930's, Keeler and John Reid, an attorney, emphasized that while using the polygraph as an interrogative instrument, the clinical interpretation of the subject's behavior and the training of the examiner should be considered. Since the interpretation and training of the examiner were important in the evaluation of a subject's polygraph test, the test was very subjective and lacked standardization which led to questions concerning the validity of the polygraph. A student of Keeler and Reid, Cleve Backster, developed the first numerical scoring system for evaluating the polygraph test, but numerical scoring did not remove the possible biases of the examiner interpretation (Grubin & Madsen, 2005).

By the 1940's, the polygraph was used by law enforcement agencies for criminal investigations and by various government agencies. By the 1960's, the polygraph was used throughout the United States, and other countries had started polygraph programs. Bersh (1969) studied the validity of the polygraph exams given to military personnel during criminal investigations. Cases were randomly chosen from criminal investigations

conducted by three branches of service during the years 1963 to 1966. Decisions of guilt or innocence following a polygraph exam were compared to decisions made by a panel of military judges who reviewed the case file which did not include the polygraph exam results. Results showed that the percentages of agreement between the polygraph examiner and the panel of judges were 92.4%. These results supported the use of the polygraph exam in this situation (Bersh, 1969). In the United States, businesses in the private sector began using the polygraph to screen applicants for employment (Office of Technology Assessment, 1983; Grubin & Madson, 2005).

In 1965, the Committee on Government Operation conducted the first evaluation of the polygraph and found no scientific evidence to support the use of the instrument to detect deception (US Congress, 1965). Regardless of this evaluation by Congress, most large police agencies in the United States began using the polygraph test to screen applicants and employees during the 1970's (Grubin & Madsen, 2005). In 1983, President Reagan issued the National Security Decision Directive 84 which authorized federal agencies to administer the polygraph exam to their employees after a leak of information regarding the funding of defense plans was found (US Congress, 1983; Brooks, 1985). The Committee of Government Operations in the United States House of Representatives requested the Office of Technology Assessment to conduct an evaluation of the scientific evidence for polygraph tests, and the Office of Technology Assessment found that the accuracy of the polygraph was undetermined and found no scientific evidence to support the use of the polygraph test for screening applicants or employees. The National Security Decision Directive 84 was rescinded (Office of Technology Assessment, 1983).

In 1988, the Employee Polygraph Protection Act legislation restricted the use of the polygraph test in the private sector, but exempted federal agencies, pharmaceutical companies, security firm employers, and public service employers, such as law enforcement agencies (Kanable, 2010). This legislation represented the first time that the federal government exercised control over the controversial use of the polygraph exam for screening employees (Kurtz & Wells, 1989). The Act was administered by the United States Department of Labor's Employment Standards Administration. By the 1990's, many state police agencies and local police departments required recruits to pass a background polygraph exam before being hired, since as public service agencies, they were exempted from the Employee Polygraph Protection Act (Forrer, Mino, & Ehart, 2008).

Polygraph test use continued, and in 1999, the Department of Energy requested a scientific review of the use of the polygraph test in personnel security screening (Grubin & Madsen, 2005). The National Academies of Science found that the polygraph test had significant limitations for screening applications. They found the test to be unreliable, unscientific, biased and a measure of physiological responses that are not uniquely related to deception. The National Academies of Science also found that due to the lack of supporting evidence of reliability and validity, using the polygraph exam for screening purposes was unjustified (Warner, 2005). Regardless of the additional findings about the lack of reliability of the polygraph test, the machine continues to be widely used in the United States and other countries. Some states restrict the use of the polygraph as a screening tool for possible employment, but few states mandate a total prohibition of the polygraph exam. Most states do not restrict use of the polygraph exam for law

enforcement officers or prospective officers (Herron, 1986). Although private sector use of the polygraph is more restricted, public sector use continues. Many large companies and companies engaged in retailing use polygraph testing (Lykken, 1985). Even though the results of polygraph testing has been found to be not valid and unreliable, law enforcement agencies still feel that valuable information is provided by polygraph exams (Warner, 2005). Many federal and local law enforcement agencies use the polygraph test for criminal investigations as well as for personnel selection (Kanable, 2010; Honts & Perry, 1992).

The modern polygraph is very similar to the original machine used in the 1920's, but the modern instrument uses digital technology and has some improvements in hardware. The polygraph machine has evolved from an analog to a more efficient digital instrument (Kanable, 2010). Polygraph machines used to be briefcase sized machines that measured physiological signals by recording the signals with multiple pens on a roll of paper, but more recent machines consist of a digitizer and a laptop recorder (Meijer & Verschuere, 2010). Some computerized polygraph systems are used in the United States (Slavkovic, 2002). The machine still measures physiological responses linked to deception, the regulation of polygraph examiners and the standardization of the administration of the test is still problematic, and the test is still considered unreliable by many scientists (Grubin & Madsen, 2005).

### **Reliability and Validity of the Polygraph Exam**

Despite the technological advances, current methods of psychophysiological detection of deception are often criticized due to a lack of scientific inquiry and methodology (Slavkovic, 2002). There is much concern among experts about the use of

the polygraph in detecting deception (Ben-Shakhar, Lieblich, & Bar-Hillel, 1982; Saxe, Dougherty, & Cross, 1985). Humans have motives and emotions and are not passive recorders and retrievers of information who can be examined effectively with a polygraph machine. The polygraph exam lacks a sound scientific basis and does not have general acceptance as a tool to detect deception (Ben-Shakhar, Bar-Hillel, & Lieblich, 1986).

Studies addressing the validity of the polygraph test have not shown reliability or proper standardization to warrant the use of the polygraph test, particularly in screening applicants, such as police officers, for employment. Iacono and Lykken (1997) used surveys to determine the validity of the polygraph. The surveys, sent to the Society for Psychophysiological Research and the Fellows of the American Psychological Association addressed many topics relevant to the scientific status of the polygraph. The results of this study were based only on respondents' self report surveys. Survey return rates were high, and respondents indicated that polygraph lie detection was not theoretically sound. The surveys also indicated that claims of polygraph validity were not sustained and accuracy was affected by the use of countermeasures, such as physical and mental countermeasures (Iacono & Lykken, 1997).

Many factors must be considered to increase the validity and reliability of the polygraph exam. Estimates of the validity of polygraph testing, as a method of detecting deception, range from 90% to 95% by proponents of the polygraph to as low as 61% by psychologists (Farber, 2011). Proponents of the polygraph claim that the polygraph accuracy rate is about 90% excluding the inconclusive cases, and the errors show only a slight preponderance of false positives over false negatives. Critics of the polygraph claim that the polygraph accuracy is about 70% with most of the errors presented as false

positives (Barland, 1985). The American Polygraph Association emphasizes that a valid polygraph examination requires the combination of a polygraph instrument that records cardiovascular, respiratory and electrodermal activity operated by a properly trained examiner using a accepted testing procedure and scoring system (Kanable, 2010).

A study conducted by Horvath and Reid (1971) investigated the reliability of the polygraph examiner diagnosis. Previous studies have found that polygraph examiners can successfully diagnosis truth or deception by interpreting only polygraph data. In this study, experienced and inexperienced polygraph examiners analyzed polygraph data independently of one another and with only basic factual information about the subject. The polygraph data from 25 case investigations including guilty and innocent subjects were presented to the polygraph examiners. The experienced examiners achieved a 91.4% accuracy rate, and the inexperienced examiners achieved a 79.1% accuracy rate in diagnosing innocence and guilt (Horvath & Reid, 1971). Studies have shown that the reliability and validity of the polygraph exam is questionable due to the collection of physiological data, the use of the control question technique on the exam, the use of countermeasures, and the training of the polygraph examiner who administers and scores the exam, and yet these exams are used the government, the private sector, in court and by law enforcement agencies during criminal investigations and to screen applicants.

### **Administration and Evaluation of the Polygraph Exam**

There are 14 major polygraph testing formats used in the United States with some formats dating from the original in the 1920's. A single-issue test format focuses on one relevant aspect of a crime. A multifaceted test format focuses on more than one aspect of a crime. A multi-issue test format contains relevant questions about completely different

issues. For example, a multi-issue pre-employment test could present questions about an applicant's honesty, criminal activity and drug use (Gordon, 2008). The format of the polygraph, the examiner administering the polygraph and the training and experience of the examiner all influence the scoring procedure for the test (Slavkovic, 2002).

In the 7-Position Numerical Analysis Scale, scoring depends on spot analysis, and each question asked during the polygraph exam has a specific location allowing the examiner to look for changes in the baseline, amplitude, duration, and frequency of the recorded signals at each spot and compare these changes to the changes at the nearest control question. Values on the seven point scale ranging from negative three to three are assigned to the differential of the two responses. The overall score for each spot is calculated by adding the assigned values, and the grand total is the sum of all spot totals. Higher reaction to the relevant questions is indicated by the negative values, and higher response to the control questions is indicated by the positive values. A score of positive six or greater indicates non-deception, and a score of negative six or lower indicates deception. Scores in between indicate an inconclusive result (Slavkovic, 2002). These inconclusive results may be classified as errors causing an examiner to be unable to render an accurate diagnosis of deception (Kanable, 2010.)

The Control Questions Test and the Guilty Knowledge Test, also known as the Concealed Information Test, are the two main types of test questions used on polygraph exams. The control questions polygraph exam asks the subject control questions and relevant questions. The guilty knowledge polygraph exam measures a subject's knowledge of specific details related to a specific incident. For example, a guilty knowledge polygraph exam during a criminal investigation may include questions about

different types of weapons, one of which may have been used in the crime. The rationale is that a guilty subject will react more strongly to questions involving the crime weapon, but an innocent subject will not react differently to questions involving any weapons. Important to both types of polygraph exams is the pre-test interview (Lewis & Cuppari, 2009).

The initial interview with the polygraph examiner referred to as the pre-test is very important to the results of the polygraph exam. During the pre-test phase of the polygraph exam, the examiner may demonstrate the ability of the machine to detect lies by asking the subject to tell a simple lie and witness the machine's reactions to the lie. Usually after the effectiveness of the polygraph machine is demonstrated, truthful subjects have reduced anxiety, but deceptive subjects have increased anxiety. Experienced polygraph examiners want to identify truthful subjects as early as possible in the examination process (Lewis & Cuppari, 2009).

The control question polygraph exam technique assesses a subject's credibility by looking for differential reactions between control and relevant questions by the subject. Relevant questions are direct accusatory questions that address the issue under investigation. Control questions are ambiguous questions to which the subject is maneuvered into answering in the negative (Honts, 1996). The rationale of using the control questioning technique on the polygraph exam is that guilty and innocent subjects will react differentially to relevant and control questions (Honts, Raskin, & Kircher, 1994). Innocent subjects will answer the relevant questions truthfully but are likely to be uncertain about the truthfulness of their answers to the control questions. Guilty subjects will answer the relevant questions deceptively but are likely to be more concerned about



these questions. Innocent subjects are expected to show stronger responses to the control questions than to the relevant questions, and guilty subjects are expected to show stronger responses to the relevant questions than to the control questions (Kircher & Raskin, 1988). Guilty subjects will produce strong physiological reactions when lying to relevant questions since the questions deal directly with the issues of the exam, such as "Did you kill the victim?" Innocent subjects will produce strong physiological reactions to control questions, such as "Before 1970, did you ever do anything dishonest?" Innocent subjects will produce stronger physiological reactions to the control questions than to the relevant questions since they are certain of the truthfulness of their answers to the relevant questions, but they may be lying or uncertain about the truthfulness of their answers to the control questions (Honts et al., 1994). Analysis and interpretation of the physiological data recorded by the polygraph is critical in providing validity and reliability of the results (Slavkovic, 2002).

Thurber (1981) researched the relationship between psychometric data and control question polygraph performance. The subjects in the research were 34 males in a police department internship program. The subjects completed the California Psychological Inventory and a polygraph exam. The results showed that subjects who scored highly on the Good Impressions subscale of the California Psychological Inventory also passed the polygraph exam. The Good Impressions subscale assesses social desirability. This research indicated a connection between social desirability and the capacity to control the autonomic processes and pass a polygraph exam. Subjects who behaved in a socially desirable way may have learned to control their autonomic processes efficiently. Subjects who passed polygraph exams may have been controlling

their physiological responses and their autonomic processes which is important to consider when administering and evaluating the polygraph (Thurber, 1981).

Honts (1996) did a field study of the control question polygraph test using files of criminal cases. Data from 41 criminal cases was examined for confirming information. Numerical scores, decisions from the original examiners and an independent evaluation were analyzed. The results indicated that the control question polygraph technique was highly valid when excluding the inconclusive answers. This study supported the validity of the control question polygraph test in real life settings. (Honts, 1996).

Ginton, Daie, Elaad, and Ben-Shakhar (1982) conducted a study to evaluate the control question polygraph exam in a real-life situation instead of using a mock crime. The study used 15 male subjects, some of whom actually cheated on an aptitude test administered at the beginning of the study. Following the test, a polygraph exam was administered, and each subject was evaluated by three examiners, one who gave the polygraph exam, one who observed and heard the pretest interview through a one-way mirror, and one who evaluated the polygraph data results. After the polygraph exams, the subjects were debriefed. Evaluations based on physiological information were not superior to those based on the behavioral information only, and evaluations based on both physiological charts and behavioral information together were more accurate than evaluations based on either information alone. A limitation of this study was that although the study simulated a real-life situation for the subjects, the polygraph examiners knew in advance that their judgments would have no consequences for the subjects which is not true in real life. Also, due to the nature of this study in finding real-life cheaters, there was difficulty obtaining a larger sample size (Ginton et al., 1982).

A meta-analysis of 14 mock crime studies of the control question polygraph exam was conducted by Kircher, Horowitz, and Raskin (1988). They found that accuracy in these studies depends on whether the subjects, the incentives provided to the subjects, and the methods used for the evaluation of physiological data accurately represent field conditions. In a mock crime study, the laboratory has advantages over the field, but the results may not be representative of the field (Podlesny & Raskin, 1977). Bradley, Malik, and Cullen (2011) found that laboratory mock tests with concealed information and the polygraph exam resulted in overestimates of detection since laboratory studies foster high recall on the part of the subject (Bradley et al., 2011). The real-life consequences of failing a polygraph test and the motivations of subjects to be truthful are much greater in the field than in the laboratory. There also may be differences in the qualifications of the examiners of the polygraph test with regard to those done in the laboratory and those done in the field which would affect the interpretation and diagnosis. In addition to these differences, in these mock crime control question polygraph studies, the amount of physiological data provided to the polygraph interpreter varied across experiments (Szucko & Kleinmuntz, 1981). This meta-analysis found that conducting mock crime experiments that closely resemble field conditions is crucial in providing accurate polygraph exam information. More studies on the control question polygraph exam with computerized standardization of scoring are necessary (Kircher et al., 1988).

Polygraph exams using control questions, which are specially formulated in a pretest interview, are the most commonly used polygraph tests in law enforcement, but simple countermeasures such as physical maneuvers during questioning enhances the physiological reactions to control questions. A physical maneuver such as tongue biting

may help a subject pass a polygraph (Honts et al., 1994). Examinees may try to alter the results of a polygraph exam by physical or mental processes. Physical countermeasures consist of the subject engaging in some type of pain to mask the physiological response, and mental countermeasures consist of the subject altering the thought patterns in order to alter the results of the polygraph exam (Lewis & Cuppari, 2009).

Honts et al. (1994) did a study investigating the effects of mental and physical countermeasures on polygraph tests and found that both countermeasures were equally effective in defeating control question polygraph tests and passing these tests (Ginton et al., 1982). The Honts study was conducted using 120 male and female subjects who were randomly assigned to groups. One group was innocent of the mock crime, and one group enacted the mock crime of stealing a rare coin. Some of the subjects received mental countermeasure training, and some of the subjects received physical countermeasure training. The results strongly suggest that control question polygraph tests may be defeated by guilty subjects trained in mental or physical countermeasures. About one half of the subjects in each countermeasure training condition passed their polygraph test with even just thirty minutes of countermeasure training. The polygraph examiner detected only 12% of the physical countermeasures and none of the mental countermeasures. This a valuable study since countermeasures are a factor that contribute to the high rate of false negative errors obtained in polygraph screening (Honts et al., 1994).

In another study, Honts, Hodes, and Raskin (1985) investigated the effects of the use of physical countermeasures on physiological detection of deception and found that training in the use of physical countermeasures affected the outcome of a polygraph

exam. The study was conducted using 65 male and female subjects, some of whom enacted a mock crime and were trained in the use of physical countermeasure to be used during the administration of a polygraph exam. Countermeasure subjects were able to defeat the control question polygraph exam by producing physiological responses that were larger to control questions than to relevant questions, and the physical countermeasures used to produce these physiological responses were undetected by the examiner (Honts et al., 1985).

Honts, Devitt, Winbush, and Kircher (1996) did a study to investigate the effects of mental and physical countermeasures on the concealed knowledge polygraph exam and found that using these countermeasures reduced the accuracy of the concealed knowledge polygraph exam. The study used 40 subjects and a mock crime scenario with some subjects receiving countermeasure training and others not receiving the training. Not only did the use of countermeasures reduce the accuracy of the polygraph exam, but the use of countermeasures was undetected by the examiner. The results of this study are consistent with other studies that show that control question and the concealed knowledge polygraph exam results are influenced by the use of counter measures (Honts et al., 1996).

The control question polygraph exam is used frequently particularly among law enforcement agencies for the purpose of screening applicants to be police officers, but the validity of this type of interrogation is not certain and remains controversial (Ginton et al., 1982). The control question polygraph exam is widely used, but is very controversial since the diagnoses made from the results rely on human interpretation which is influenced by the use of countermeasures, bias, training and experience of the examiner.

In order to minimize the effect of interpretation of polygraph protocols and promote standardization of practice, Kircher and Raskin (1988) investigated the feasibility of using computer programs to quantify physiological responses to test questions on a polygraph exam and to assess the probability that the questions were answered truthfully. In the investigation, computer analysis was used to evaluate physiological responses and assess the probability of truthfulness in data obtained from two mock crime experiments involving subjects who were either guilty or innocent of committing a mock theft. The computer analysis was compared to human numerical evaluations, and no significant differences between computer and human evaluations were found (Kircher & Raskin, 1988).

A study by Honts and Amato (2007) investigated the automation of a screening polygraph test. The study examined the effects of automating the relevant-irrelevant psychophysiological detection of deception test using a mock screening scenario. Eighty participants were either truthful or deceptive on an employment application and then administered a polygraph exam by an experienced polygraph examiner or with a fully automated polygraph exam. The automated polygraph exam produced significantly more accurate results than the polygraph exam administered by the human examiner, and the automated method significantly discriminated deceptive from truthful responses (Honts & Amato, 2007).

### **Polygraph Exam Use by Law Enforcement Agencies**

Most law enforcement agencies use the polygraph exam regardless of reliability to gain additional information especially in criminal investigations. A study conducted by the Federal Bureau of Investigation's polygraph unit showed that out of the 2,641

deceptive criminal polygraph reports reviewed, 1,316 provided no additional useful information, but 1,315 reports resulted in acquiring confessions, admissions, or information of investigative value (Warner, 2005). A meta-analysis was conducted to determine individual human differences in the ability to detect deception without the use of the polygraph. Using 108 studies done between 1970 and 2004, Aamodt and Custer (2006) found that age, confidence, experience, education and gender of the examiner were not significantly related to the rate of accuracy in detecting deception. Of interest was the finding that police officers, detectives, judges and psychologists were no more accurate at detecting deception than other individuals not involved in these fields (Aamodt & Custer, 2006).

Law enforcement pre-employment polygraph screening exams are a decision-support tool which should be used in conjunction with other screening tools to help increase the validity of the selection process. Problems surrounding the polygraph exam such as the misunderstanding of the test, ineffective selection of test issues, poorly constructed test questions and misguided policies addressing the use of the polygraph decrease the validity and reliability of using the polygraph exam as part of the screening process (Handler, Honts, Krapohl, Nelson, & Griffin, 2009). Polygraph exams are used in both the pre-conditional and post-conditional offer stages in law enforcement. The pre-employment evaluation stage of law enforcement may involve the integration of an applicant's behavioral history information which will be accessed through a personal history questionnaire, psychological testing, interviews and a polygraph exam (Ben-Porath et al., 2011). Before a polygraph exam is administered, an applicant should meet the requirements set forth by the Board of the American Polygraph Association (2012) to

be deemed suitable for the exam ("Model Policy for the Evaluation of Examinee Suitability for Polygraph Testing," 2012).

In 1995, the American Polygraph Association conducted a survey to determine the use of pre-employment polygraph testing in 626 law enforcement agencies throughout the United States and found that 62% of the respondent agencies utilized the polygraph exam as part of their applicant screening process. Most respondent law enforcement agencies reported that the polygraph exam was as useful a tool for screening applicants as background investigation, written psychological tests, psychological interviews, personal interviews and interviews by a selection board, since they were able to reject approximately a quarter of their applicants as a result of information obtained through the polygraph exam that had not been uncovered with the other screening procedures (Handler et. al., 2009).

In 1995, Sanders, Hughes, and Langworthy (1995) did a survey of police officer recruitment and selection in major police departments in the United States and found that between 1990 and 1994 there was an slight increase in the use of the polygraph from 69% in 1990 to 69.5% in 1994 (Sanders et al.,1995). The Law Enforcement Management and Administrative Statistics (LEMAS) survey is a nationally representative sample of state and local law enforcement agencies (Burch, 2012). A 2000 LEMAS survey found that 67% of primary state law enforcement agencies in the United States used the polygraph exam (U.S. Department of Justice, 2000). In 2003, about 45% of local police departments in the United States used the polygraph exam in the screening process. In 2007, polygraph exams were used by 50% of local police departments in the United States (Reaves, 2010). These statistics show an increase in the use of the polygraph exam



among law enforcement agencies which indicates that the exam is considered to be a useful tool available to law enforcement agencies to use in obtaining information concerning criminal activity or information about police officer applicants.

Screening polygraph questions used by law enforcement agencies test for credibility about involvement in specified patterns of behavior which take place over long periods of time. Criminal investigators use the polygraph exam to get information about specific events, but questions on screening polygraph exams refer to the subject's entire lifetime or their entire adult lifetime which seems to decrease reliability due to the reliance on a much longer period of remembering. Pre-employment polygraph exams are conducted in the absence of a known incident in contrast to criminal investigative polygraph exams which focus on a subject's involvement in a single known event ("Model Policy for Law Enforcement/Public-service Pre-employment Polygraph Screening Examinations," 2012). Screening polygraph exams involve investigation of multiple behavioral or suitability topics instead of a known incident, which means that the subject could be deceptive to one or more relevant issues while simultaneously being truthful to others (Podlesny & Truslow, 1993). Questions on a screening polygraph exam should all meet accepted criteria, and behaviors referred to should be supported by clear definitions that are understood by the examinee and the examiner (Handler et al, 2009).

The questions on screening polygraph exams should provide predictive validity concerning job performance and be presented in a structural way that is thorough and non-confrontational. Studies have shown that relevant structured interviews produce more accurate predictive results (Cortina, Goldstein, Payne, Davison, & Gilliland, 2000; McDaniel, Whetzel, Schmidt, & Maurer, 1994). The base rate of the relevant questions

on the polygraph screening exams creates problems with interpretation and affects validity and reliability. For example, a question about felonies may have a low base rate of occurring, but a question about illegal drug use may have a high base rate of occurring. These differences affect the interpretation of and the reliability of the test (Handler et al., 2009). A diagnostic test analyzing base rate change is available, but behaviors with low or high base rate occurrence are not effectively discriminated using the polygraph test, and do not aid the interpreter in selecting suitable and unsuitable applicants (Wells & Lindsay, 1980; Wells & Olson, 2002). The results of the polygraph exam become more valid if the test questions meet standard, accepted criteria (Handler et al., 2009). In 2007, the American Polygraph Association adopted a standard of practice effective January 1, 2012 that requires members to use validated physiological detection of deception examination techniques that meet certain levels of criterion accuracy which means that the test results have to correspond to what the test is designed to detect (Gougler et al., 2011).

There are two types of errors, false positives and false negatives, common to polygraph exams. A positive result signifies that the subject was involved with a specific behavior, and a negative result signifies that the subject was not involved with a specific behavior. A false positive results from a truthful subject being judged as deceptive by the examiner, and a false negative results from a deceptive subject being judged as truthful by the examiner. Reliable and valid screening polygraph exam questions should be sensitive enough to the important issues to avoid false positives and false negatives. Screening polygraph exam questions should also be very specific with regard to the issues of concern in order to avoid the possibility of questions addressing unrelated issues

causing false positives. These types of errors on polygraph exams contribute to the lack of reliability and validity of the test. In order to maximize the reliability and validity of a screening polygraph test, questions should be empirically related to hiring decisions and behaviors that are performance predictors (Handler et al., 2009).

### **Standardization of the Polygraph Exam**

A major contribution to the lack of reliability and validity of the screening polygraph exam is the lack of standardization in the interpretation of the polygraph exam. Polygraph examiners should use analysis procedures based on scientific reasoning, but interpretation is done by inspection of the data for physiological reactions or changes in reaction trends that occur in response to repeated presentations of a specific question which is limited to an examiner's impressions. Research shows that the rate of human detection of deception is only about 54% (Aamodt & Custer, 2006). A screening polygraph examiner may also use a numerical method aided by a computer-based statistical analysis for interpreting the polygraph data, but this type of interpretation is standardized from forensic settings and not accurately generalizable to screening settings. In a numerical scoring, for a subject to be considered truthful, all test questions must produce truthful answers, but to be considered as lying, only one untruthful answer is necessary. Screening polygraph examiners rely on hand-scoring systems and their opinions to arrive at a score (Handler et al., 2009). Polygraph examiners in the United States are not well trained, and there is a lack of standardization of the process of administering and interpreting the polygraph exam (Honts & Perry, 1992)

The validity, accuracy, and reliability of pre-employment polygraph exam screening do not seem to be sufficient enough to justify the use of the polygraph exam as

a screening tool for law enforcement agencies. There is not enough research investigating the accuracy of polygraph based pre-employment decisions, and test outcomes are not directly related to employment decisions. More regulation and standardization of the polygraph exam and screening process is necessary. The examiner should be licensed, and there should be accountability with regard to the interpretation of the polygraph results. There should be standard rules and regulations regarding what is and what is not permissible practice during the process of administering the exam and what course of action is available if the rules are not followed. Following standard procedure would increase the validity of the polygraph exam particularly when used as an applicant screening tool for law enforcement agencies (Horvath, 1985).

Some law enforcement agencies in the United States require police officer applicants to have up to 60 college credits, and most state and local government agencies require an applicant to have a high school diploma, be 21 years old, pass a written examination, pass a physical exam, be a United States citizen, pass a psychological evaluation and pass a polygraph exam (Woska, 2006). The use of the polygraph exam in screening job applicants is subject to abuses. There must be standard rules to be followed to protect the employer and the applicant in the investigative process. This may be accomplished through regulation and standardization of the entire process of administering a polygraph exam. Only experienced, licensed examiners should administer a polygraph exam, and the exam should be standardized with clear instructions given before, during and after the exam (Hurd, 1985).

The polygraph examiner should have an acceptable background and qualifications. Education, training, experience and ethical principle standards and

requirements should be regulated by laws (Yeschke, 1965). The polygraph exam is a complex and comprehensive exam, and the results are influenced by many factors such as technique implemented, population tested, context of the exam, examiner training, and goals of detection all of which should be regulated and standardized. The results are a function of both science and the ability of the examiner to consider the many psychological factors before making a decision about a subject's truthfulness. The role of the examiner is critical to both the administration and the interpretation of the polygraph exam (Lewis & Cuppari, 2009). Problems with the polygraph exam are compounded by the complexity of the physiological response protocols and the lack of standardized generally accepted methods for evaluation (Kircher & Raskin, 1988).

The Kircher and Raskin (1988) study found that computer techniques may be developed for applied settings and would perform at least as well as expert human interpreters. Computer analysis to detect truth and deception in applied settings would not depend on the expertise and objectivity of polygraph interpreters. Use of an automated polygraph exam method would reduce the risk of errors of human judgment, and minimize disagreements among polygraph examiners and experts concerning the polygraph outcome. Using an automated system for administering and evaluating polygraph exams would improve the reliability and accuracy of polygraph exam results particularly in job screening. A computerized evaluation could determine whether a subject is truthful or deceptive and the probability of truthfulness which is more informative than a categorical judgment and is readily understood and communicated (Kircher & Raskin, 1988).

Much of the criticism of the use of the polygraph exam is concerned with the examiner with regard to training and bias. This problem could be resolved with the use of an automated system which would be more standardized, reliable and valid. A computer would interactively present the examination and collect the data. Studies by Kircher and Raskin (1988) and Honts and Amato (2007) have shown positive results using automated polygraph systems. With the use of automated polygraph exam systems, issues of examiner bias would be removed and reliability and validity of test results would be improved (Kircher & Raskin, 1988; Honts & Amato, 2007). More research on automation systems is needed.

### **Implications**

The polygraph exam has been used in some form for over 90 years. From the beginning of its use, the polygraph has been utilized as a lie detector to detect physiological changes in the human body that are thought to be linked with deception. Research has shown that these physiological changes may be due to other psychological processes and not simply lying. There are many controversial problems with the administration of the polygraph exam, such as type of test questions and the use of countermeasures to pass the exam. Scoring and evaluation of the polygraph exam are also problems since there does not seem to be a standardization of these processes. There also does not seem to be standardization with regard to the examiner and the individual who evaluates the polygraph exam. More consistency and standardization of polygraph exam procedures as well as automated administration and computerized analysis would increase the validity and reliability of the polygraph exam as a screening tool. Even though research has shown that the polygraph exam may not be a reliable, valid tool to

detect deception and has not been used consistently, the polygraph exam is used by the government, by the private sector, and by law enforcement agencies for criminal investigations as well as for employment screening (Green & Heilbrum, 2011; Grubin & Madsen, 2005; Slavkovic, 2002; Iacono & Lykken, 1997; Kircher & Raskin, 1988).

The purpose of the current study was to examine the use of the polygraph exam by law enforcement agencies as part of the screening process to find suitable applicants for employment as police officers and to determine if the polygraph exam is used consistently by law enforcement agencies throughout the United States. The screening process for law enforcement applicants is an important procedure since these applicants have the potential to become enforcers and protectors of the safety and welfare of society. It was hypothesized that polygraph exams are not standardized or used consistently by law enforcement agencies.

## **Chapter 3**

### **Methodology**

#### **Subjects**

The subjects were the ten largest law enforcement agencies in the United States. These agencies had the largest number of sworn police department employees. Survey were mailed to New York City, New York, Chicago, Illinois, Los Angeles, California, Philadelphia, Pennsylvania, Houston, Texas, Washington, D. C., Phoenix, Arizona, Dallas, Texas, Miami-Dade, Florida, and Detroit, Michigan. The survey addressing law enforcement agency employment screening procedures was completed by an employee of the law enforcement agency and returned in the stamped addressed envelope which was enclosed. The surveys were kept anonymous, the participants were not compensated, there was no risk involved, and the law enforcement agencies represented various demographic areas of the United States.

#### **Variables**

A survey (see Appendix) research technique was used to obtain data. The survey research technique looked at the consistency of the use of the polygraph exam by law enforcement agencies in the selection of applicants. The survey, similar to a survey used by Chang-Bae (2006) in his study on psychological testing for recruit screening, was created specifically for the current study and addressed polygraph exam use for police applicant screening. Questions pertaining to the use of the polygraph exam, the administration of the polygraph exam, the scoring and analysis of the polygraph exam, and the disclosure of the results of the polygraph exam were included in the survey. The survey addressing police applicant screening procedures was mailed to the law



enforcement agencies in New York City, New York, Chicago, Illinois, Los Angeles, California, Philadelphia, Pennsylvania, Houston, Texas, Washington, D. C., Phoenix, Arizona, Dallas, Texas, Miami-Dade, Florida, and Detroit, Michigan in order to obtain data on law enforcement agency employment screening procedures. Included in the mailing was an addressed, stamped envelope in which the survey was returned to the researcher.

### **Procedure**

A survey, addressing police applicant screening procedures, was mailed to each of the ten participant law enforcement agencies. The subjects read an alternate consent form and completed and returned the survey to the researcher in an included stamped envelope, and all responses were kept anonymous. Information and data were also obtained through reading law enforcement blogs, sending emails, reading websites, and telephone calls to law enforcement agencies. After receiving the returned surveys, the responses were recorded and analyzed. All of the participants were treated according to ethical standards. The data obtained from the responses of the law enforcement agencies was analyzed using descriptive statistics. These statistics reflected the consistency of the use of the polygraph exam during the police applicant selection process.

## Chapter 4

### Results

The current study examined the use of and the consistency of use of the polygraph exam by law enforcement agencies throughout the United States as part of the screening process to find suitable applicants for employment as police officers. The administration of the polygraph was investigated, and results showed that there was inconsistency with regard to the type of polygraph used, the automation of the polygraph, the number of polygraphs administered per applicant, the scoring procedure of the polygraph exam, and the disclosure of the results to the applicant.

As shown in Figure 1, the polygraph exam was used by 70% (n=7) of the agencies surveyed, and all of the agencies that responded to the questions regarding the administration of the polygraph reported that the polygraph exam was administered by a polygraphist.

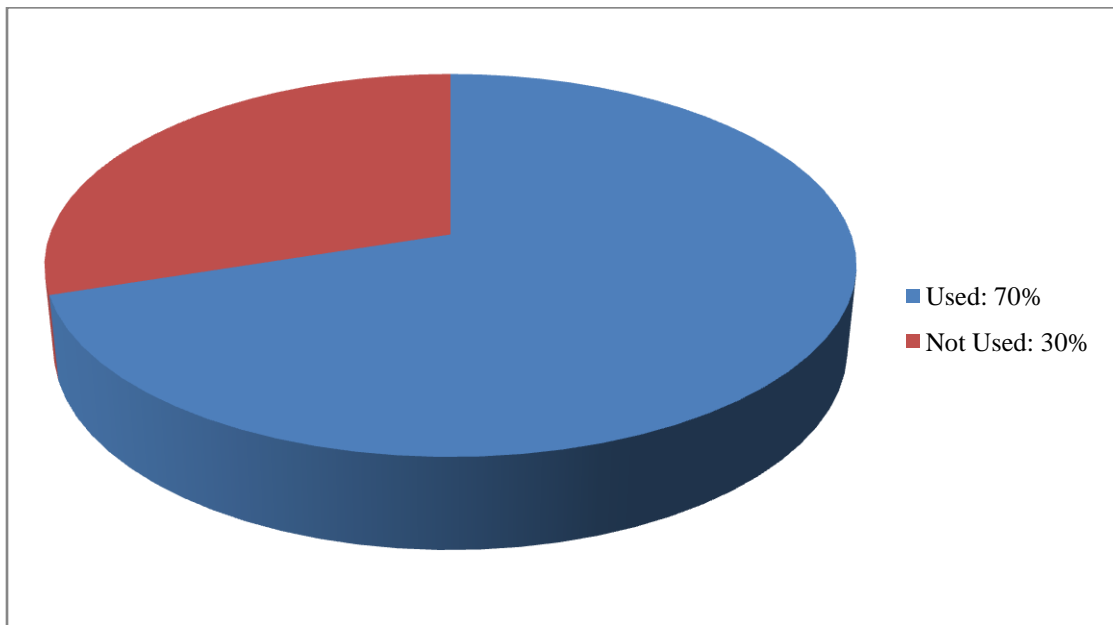


Figure 1. Polygraph exam use in selection process.

Twenty percent (n=1) of the agencies reported that a police sergeant analyzed the polygraph exam results, and 80% (n=4) of the agencies reported that a polygraphist analyzed the polygraph exam results, but the qualifications of the polygraphist, or polygraph examiner, and the police sergeant were not stated. The type of polygraph instrument used was inconsistent among the agencies that responded to the survey (n=4), with two agencies using the Lx-4000, one agency using the LPDT, and another agency using different polygraph instruments for different polygraph exams. As shown in Figure 2, of the agencies that responded to the surveys, 75% used an automated polygraph exam (n=3), and 25% of the agencies did not use an automated polygraph exam (n=1).

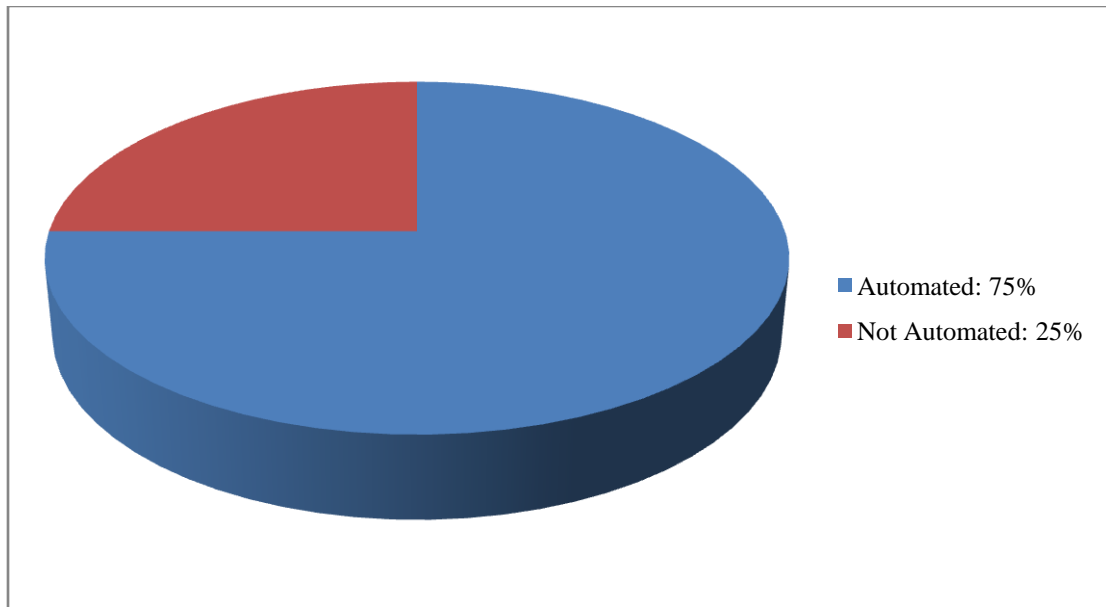


Figure 2. Polygraph exam.

An automated polygraph is one in which a technician oversees an automated system that administers the polygraph exam as a standardized test with tape recordings. As Figure 3 shows, of the agencies that responded to the surveys, 20% of the agencies administer one

polygraph exam to each law enforcement applicant (n=1), and 80% of the agencies administer one or two polygraph exams to each applicant (n=4).

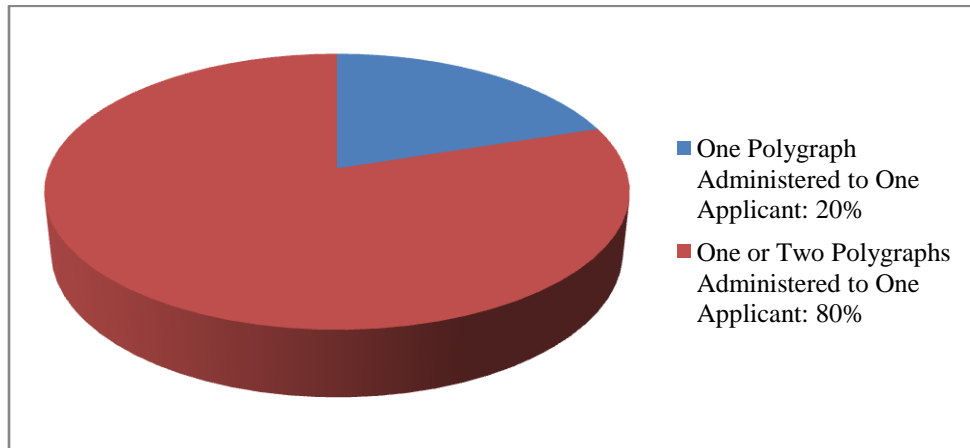


Figure 3. Polygraphs administered.

Of the agencies that use the polygraph and responded to the survey (n=3), all of the agencies use both human and computer scoring procedures for the polygraph exam. As shown in Figure 4, of the agencies that responded to the surveys, 75% disclosed the results of the polygraph exam to the applicants (n=3), and 25% of the agencies did not disclose the results of the polygraph exam to the applicants (n=1).

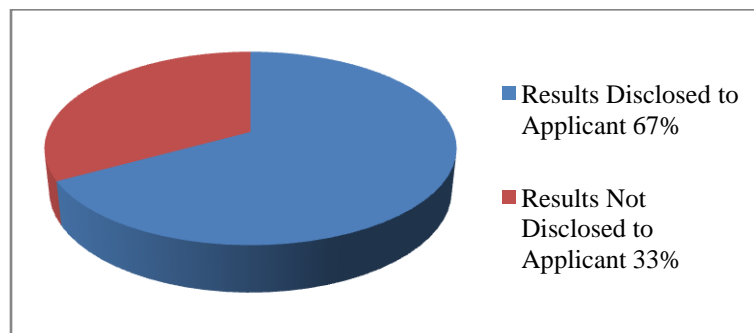


Figure 4. Polygraph results.

The procedures, the order in which the procedures are administered, and the appeal process utilized by the ten largest law enforcement agencies in the United States were also investigated. The screening procedures, in addition to the polygraph exam, used by law enforcement agencies were the background investigation, the criminal record check, the driving record check, the medical exam, the drug test, the physical agility test, the credit history check, the written aptitude test, the personal interview, and the psychological evaluation. As shown in Figure 5, the most frequently used procedures used by all of the ten agencies surveyed were the background investigation, the medical exam, and the psychological evaluation.

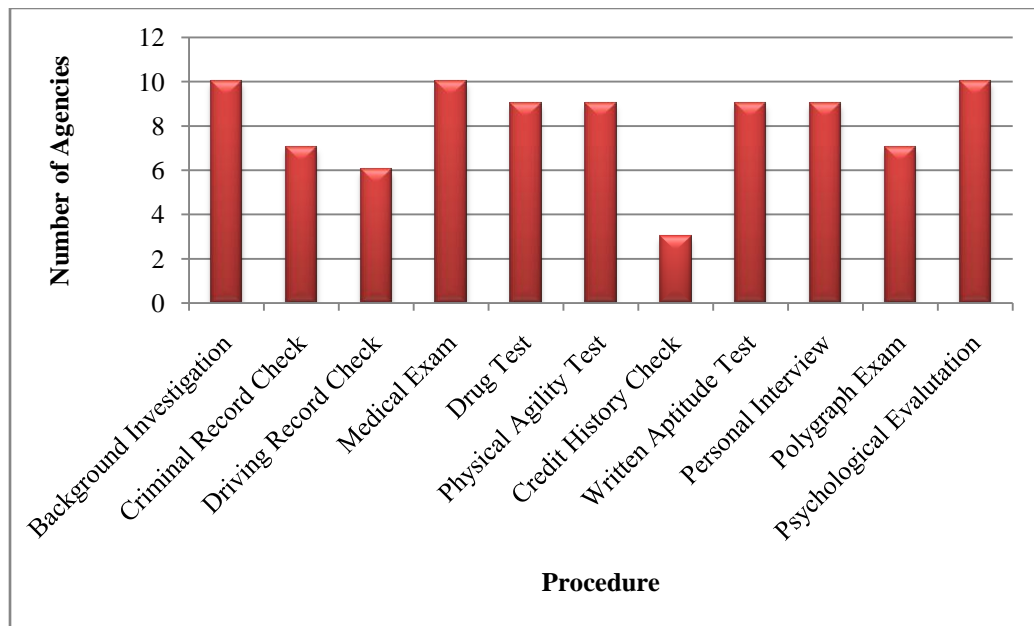


Figure 5. Procedures used.

The drug test, the written aptitude test, and the personal interview were used by 90% of the agencies surveyed (n=9). The criminal record check was only used by 70% (n=7) of

the agencies surveyed. The driving record check was used by 60% (n=6), and the credit history check was used by 30% (n=3) of the agencies surveyed.

The order in which the procedures were administered by law enforcement agencies was investigated. As shown in Table 1, the agencies varied in the order that they each administered the procedures.

Table 1  
*Procedure Order*

Procedure	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>
Background Investigation		10%		10%	50%	10%		20%			
Criminal Record Check		17%			33%	33%	17%				
Driving Record Check	20%	40%		20%			20%				
Medical Exam		20%	10%			30%	10%	10%	10%	10%	
Drug Test	11%		22%	22%	11%			11%	22%		
Physical Agility Test	10%	10%		20%	10%	10%	20%	20%			
Credit History Test	100%										
Written Aptitude Test	67%	11%	22%								
Personal Interview		22%	22%	22%	11%		11%		11%		
Polygraph Exam			29%	14%		14%	29%	14%			
Psychological Evaluation/Personality Inventory			10%	10%	10%	10%	10%	20%		20%	10%

The results indicated that the background investigation was administered by the agencies as the fifth step of the procedures 50% (n=5) of the time. The written aptitude test was administered by the agencies as the first step of the procedures 67% (n=6) of the time. The polygraph exam was administered by the agencies as the third, fourth, sixth, seventh, or eighth steps of the procedures. The polygraph exam was administered by the agencies as the third step of the procedures 29% (n=2) of the time and was administered by the agencies as the seventh step of the procedures 29% (n=2) of the time. The polygraph exam was administered as the fourth step of the procedures 14% (n=1) of the time, as the

sixth step of the procedures 14% (n=1) of the time, and as the eighth step of the procedures 14% (n=1) of the time.

Whether or not the agencies allowed appeals for any of the procedures of the selection process was examined. As shown in Figure 6, of the agencies that responded to the surveys, 86% (n=6) allowed appeals for any of the procedures of the selection process, and 14% (n=1) of those agencies did not allow appeals for any of the procedures of the selection process.

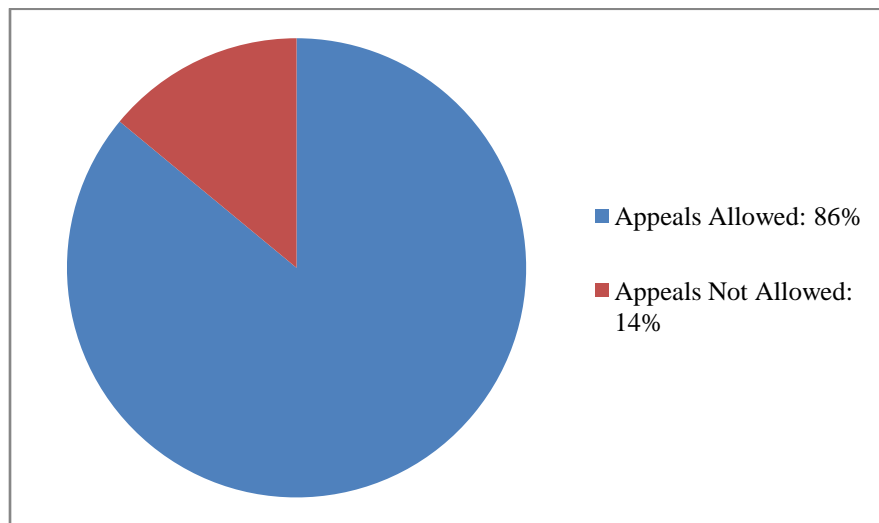


Figure 6. Appeals.

Minimum age of the applicant and minimum number of college credits attained by the applicant were also investigated. As shown in Figure 7, results indicated that 50% (n=5) of the agencies required a minimum age of 21 for applicants, 30% (n=3) of the agencies required a minimum age of 19 for applicants, and 20% (n=2) of the agencies required a minimum age of 18 for applicants.

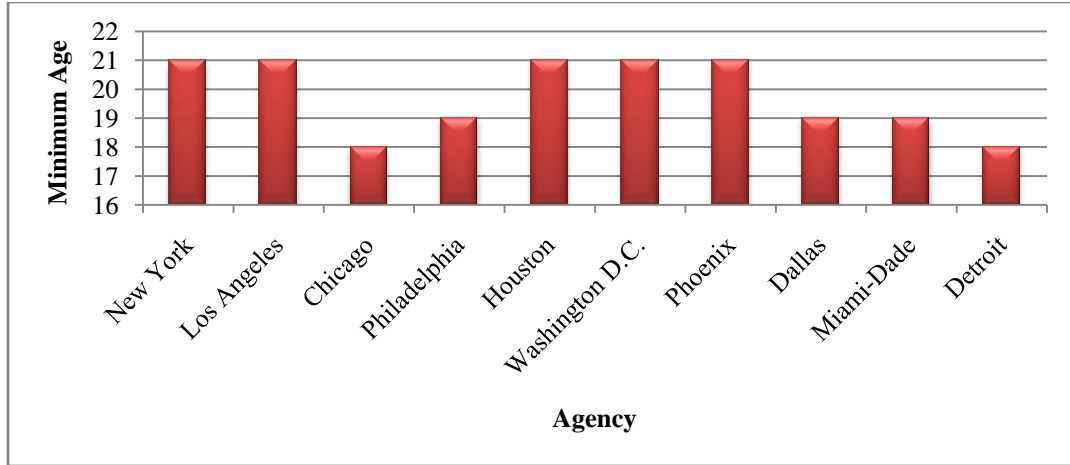


Figure 7. Minimum age of applicants.

As shown in Figure 8, results indicated that 50% (n=5) of the agencies required a minimum of 60 college credits for applicants, 10% (n=1) of the agencies required a minimum of 48 college credits for applicants, and 40% (n=4) of the agencies did not require any college credits.

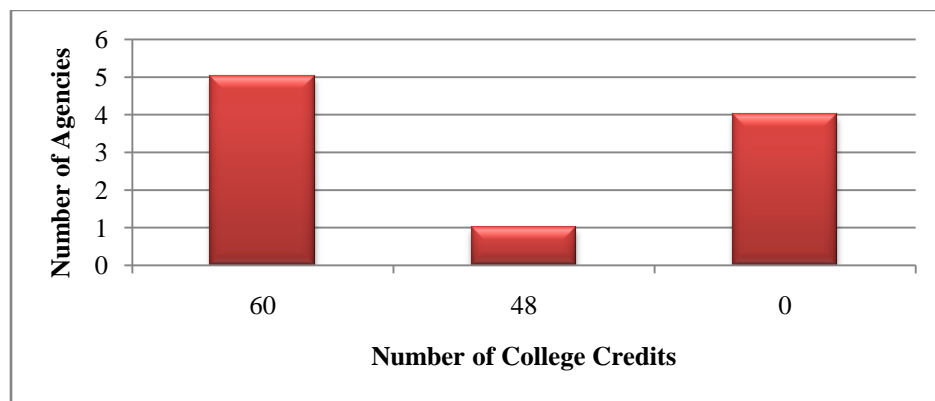


Figure 8. Minimum college credits required.



## Chapter 5

### Discussion

#### Conclusions Regarding the Polygraph Exam Use in Sample Population

The purpose of the current study was to investigate the use of and the consistency of use of the polygraph exam as part of the screening process for prospective applicants for employment as police officers by law enforcement agencies throughout the United States. It was hypothesized that polygraph exams are not standardized or used consistently by law enforcement agencies. The results of the current study supported the hypothesis and indicated that the polygraph exam is not standardized or used consistently by law enforcement agencies throughout the United States as part of the applicant screening process.

The results showed that there was inconsistency with regard to the type of polygraph instrument used, the automation of the polygraph, the number of polygraphs administered per applicant, the scoring procedure of the polygraph exam, and the disclosure of the polygraph exam results to the applicant. Not all of the agencies surveyed used the polygraph exam, but all of the agencies that used the polygraph exam administered the exam using a polygraphist who may or may not be licensed. Some agencies reported that a police sergeant analyzed the polygraph exam results while other agencies reported that a polygraphist analyzed the polygraph exam results, but the qualifications of the polygraphist and the police sergeant were not stated. The type of polygraph instrument used was not consistent among the agencies, and some agencies used automated polygraph exams while other agencies did not use automated exams. Some agencies administered one polygraph exam to applicants while others administered

one or two polygraph exams to each applicant. Scoring of the polygraph exam was done by human and computer scoring procedures among all of the agencies surveyed, and reliability issues exist with both types of scoring. Some of the agencies disclosed the results of the polygraph exam to the applicants while others did not disclose the results of the polygraph exam.

The agencies were also not consistent in the use of screening procedures other than the polygraph in the employee selection process. There were differences in which procedures were used, in the order in which the procedures were administered, in whether appeals were permitted in the process, in the minimum age requirement, and in the minimum amount of college credits required among the law enforcement agencies. Since police officers are valuable to the welfare of society, the law enforcement applicant screening process should be fair, accurate, consistent, and should ensure that the best candidates are chosen for the job.

The results of the current study agree with previous research since inconsistencies were found with regard to the use of the polygraph exam as well as with other screening tools in the screening process of police officer applicants by law enforcement agencies throughout the United States. Research indicates that since 1995, there has been an increased use of the polygraph exam as a screening tool for law enforcement applicants in the United States (Hughes, & Langworthy, 1995; Sanders, Hughes, & Langworthy, 1995; U.S. Department of Justice, 2000; Reaves, 2010). Many federal and local law enforcement agencies use the polygraph exam for criminal investigations as well as for personnel selection (Kanable, 2010; Honts & Perry, 1992). Research indicates that although the polygraph exam is used by law enforcement agencies in the screening

process of applicants, that use is not consistent, standardized, and not fully regulated (Grubin & Madsen, 2005).

The lack of practice standardization in the use of the polygraph exam administration for the police officer selection process is a challenge, and there is a lack of effort among practitioners to develop a body of best practices for screening examinations that could increase the reliability and validity of the polygraph exam when used as a screening tool (Handler, Honts, Krapohl, Nelson, & Griffin, 2009). The American Polygraph Association, established in 1966, is the largest professional association for polygraphy in the world and has a code of ethics, standards of practice, and grievance procedures, but non-American Polygraph Association accredited schools exist. There is little regulation of polygraph examiners other than twenty of the states requiring polygraph examiners to be registered with a state board or the American Polygraph Association. Individuals do not have to be licensed or have particular training to purchase a polygraph instrument and practice polygraphy privately. The consistency of use, regulation, and standardization of use of the polygraph exam remains problematic, especially when used as a screening tool by law enforcement agencies to screen police officer applicants (Grubin & Madsen, 2005). Adopting more standardized approaches in the administration and evaluation of polygraph exams will increase the reliability and validity of this screening method which is a very important factor to consider since this method is applied to the hiring process of individuals responsible for public safety (Handler, Honts, Krapohl, Nelson, & Griffin, 2009).

## **Limitations**

The current study provided additional information to the research on the law enforcement screening process but was limited by a narrow focus on the ten largest law enforcement agencies, a low response rate, whether or not the responses were truthful or accurate, and a reluctance by the participants to divulge information. Not all of the surveys were completed and returned, and some were returned incomplete. In addition to the surveys, other methods were used to obtain information and data such as reading law enforcement blogs, sending emails, reading websites and making telephone calls to law enforcement agencies. The participants may not have been truthful in their responses to the surveys, internet emails, and telephone calls, and the information and data obtained from the law enforcement blogs and websites may not have been reliable.

Information and data obtained from internet websites may not have been reliable since the websites may not be updated and maintained on a regular basis. The telephone calls did not produce enough information and data because the participants were apprehensive and not cooperative about divulging information about the law enforcement screening process. Apprehension and non-cooperativeness seemed to be caused by the participants not wanting to divulge information about the police screening process to possible applicants. Even though the current study had limitations, the study provided additional information to the available research concerning the law enforcement agency applicant screening process and provided implications and future direction for further investigation.

## **Future Research Recommendations**

Future research should include more law enforcement agencies as participants in order to obtain more information and data concerning the law enforcement screening process with particular emphasis on the polygraph exam as a screening tool. Research should investigate whether or not the use of the polygraph exam in the screening process follows regulations and standardization. Sending surveys to multiple local state law enforcement agencies across the United States, and not just the ten largest agencies, would yield more information and data concerning the standardization of the screening process that would be more generalizable and representative of the law enforcement screening process in general. Other future research should include studies concerning the screening process and how elements of the screening process, such as the polygraph exam results, provide valid indicators of police officer success and job performance.

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## Appendix

### Survey

The purpose of this study is to investigate the procedures that are used as part of the law enforcement employee selection process. This research is being conducted by Jessica Mark and Rebecca Mark of the Psychology Department, Rowan University, in partial fulfillment of their M.A. degrees in School Psychology. Your participation in this study will consist of answering the following questions and mailing the completed survey in the enclosed, stamped, addressed envelope. There are no risks involved, and you are free to withdraw your participation at any time without penalty. Your responses will be kept anonymous. By taking this survey, you agree that any information obtained from this study may be used in any way thought best for publication or education provided that you are in no way identified, and your name is not used. Participation does not imply employment with the State of New Jersey, Rowan University, the principal investigator, or any other project facilitator. If you have any questions or problems concerning your participation in this study, please contact Jessica Mark or Rebecca Mark at (856) 435-0620 or their faculty advisor, Dr. Dihoff at (856) 256-4000 ext. 3783.

State:

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Name of agency:

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Size of agency: \_\_\_\_\_

Which of the following procedures do you use in the employee selection process? Check all that apply and circle pre or post according to whether you use them as pre or post conditional offer of employment:

____ <b>Background investigation</b>	pre	post
____ <b>Criminal record check</b>	pre	post
____ <b>Driving record check</b>	pre	post
____ <b>Medical exam</b>	pre	post
____ <b>Drug test</b>	pre	post
____ <b>Physical agility test</b>	pre	post
____ <b>Credit history check</b>	pre	post
____ <b>Written aptitude test</b>	pre	post
____ <b>Personal interview</b>	pre	post

\_\_\_\_\_ **Polygraph exam** pre post

If you use the polygraph, please answer the following questions:

Who administers the polygraph exam?

Police Psychologist Chief of Police Other \_\_\_\_\_

Who analyzes the polygraph exam results?

Police Psychologist Chief of Police Other \_\_\_\_\_

Which polygraph machine is used? \_\_\_\_\_

Is the polygraph exam automated?

Yes No

How many polygraphs are administered to a single applicant?

1 2 More than 2

What is the scoring procedure of the polygraph exam?

Human Computerized Both

Describe the scoring procedure of the polygraph exam:

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What is the selection/rejection rate for the polygraph exam?

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Are the results of the polygraph exam disclosed to the applicant?

Yes No

\_\_\_\_\_ **Psychological evaluation/Personality inventory** pre post

If you use any type of psychological evaluation/personality inventory, please answer the following questions:

Check all that apply:

\_\_\_\_\_ Minnesota Multiphasic Personality Inventory (MMPI, MMPI-2,  
or MMPI-A)

\_\_\_\_\_ California Personality Inventory (CPI)

\_\_\_\_\_ Inwald Personality Inventory (IPI)

\_\_\_\_\_ Neuroticism Extraversion Openness Personality Inventory (NEO-PI,  
NEO-PI-R, or NEO-FFI)

\_\_\_\_\_ Myers-Briggs Type Indicator (MBTI)

\_\_\_\_\_ Personality Assessment Inventory (PAI)

\_\_\_\_\_ 16 Personality Factor Questionnaire (16PF)

\_\_\_\_\_ Clinical Analysis Questionnaire (CAQ)

\_\_\_\_\_ Rorschach

\_\_\_\_\_ Other: Name other tests \_\_\_\_\_

Who administers the psychological evaluations/personality inventories?

Police Psychologist Chief of Police Other \_\_\_\_\_

What is the selection/rejection rate for the psychological evaluations/personality inventories?

\_\_\_\_\_

Are the results of the psychological evaluations/personality inventories disclosed to the applicant?

Yes

No

Please number the following procedures in the order that you administer them during the selection process. Leave blank if the procedure is not used:

\_\_\_\_ Background investigation

\_\_\_\_ Criminal record check

\_\_\_\_ Driving record check

\_\_\_\_ Medical exam

\_\_\_\_ Drug test

\_\_\_\_ Physical agility test

\_\_\_\_ Credit history test

\_\_\_\_ Written aptitude test

\_\_\_\_ Personal interview

\_\_\_\_ Polygraph exam

\_\_\_\_ Psychological evaluation/personality inventory

Do you allow appeals for any of the procedures of the selection process?

Yes

No

Please describe the appeal process:

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What is the overall selection/rejection rate of applicants? \_\_\_\_\_