AN EVALUATION OF THE NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION HORIZONTAL GAZE NYSTAGMUS TEST AT A .08 BLOOD ALCOHOL CONCENTRATION FOR THE STATE OF TEXAS

A Dissertation

by

LANCE ARTHUR PLATT

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2004

Major Subject: Educational Human Resource Development

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ABSTRACT

An Evaluation of the National Highway Traffic Safety Administration Horizontal Gaze Nystagmus Test at a .08 Blood Alcohol Concentration for the State of Texas. (May 2004)

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M.S., Texas A&M University

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This study investigated the blood alcohol concentration (BAC) predictions of above or below the .08 per se level by Texas peace officers in the field based on the scoring of the National Highway Traffic Safety Administration (NHTSA) Horizontal Gaze Nystagmus (HGN) test. This study involved the submission of 35 standardized field sobriety testing (SFST) evaluations, including the HGN test from Texas peace officers throughout the State of Texas in a six-month period after completion of the SFST practitioner course. A total data set of 2,000 individual samples was used for this study.

A statistical analysis of the data indicated that Texas peace officer BAC predictions of above or below the .08 per se level, based upon the observation and scoring of the observed clues during the administration of the HGN test, were 92.8% accurate during the first six month period upon completion of the SFST practitioner course. An analysis of the data also indicated that Texas peace officer BAC predictions of above or below the .08 per se level, based upon the observation and scoring of the observed clues during the administration of the HGN test, were more accurate during the second three-month

period (94.0%) as opposed to the first three-month period (91.6%) upon the completion of the SFST practitioner course. There was no statistical significance found between the two three month periods for BAC predictions by the Texas peace officers. The mean BAC for this study was .114.

Three recommendations were made as a result of this study. First, the Texas peace officer should submit the 35 SFST evaluations on a bi-yearly basis to ensure consistency in the administration of the tests. Second, the Texas peace officer should attend SFST update training on a bi-yearly basis to maintain proficiency in the SFST battery and curriculum. Third, the current SFST practitioner curriculum should focus more on the administration and scoring of the SFSTs including the HGN test to maximize the learning of the competencies of the correct administration and scoring of the SFST battery.

DEDICATION

This study is dedicated to my wife, Elaine Marie Platt. Words are not enough to tell you how much your devotion and faith has meant to me throughout this entire process. It is impossible for me to imagine my life without you. I love you.

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I first want to acknowledge the members of my committee: Dr. Walt Stenning, Dr. Ken Paprock, Dr. Lloyd Korhonen, and Dr. Don Davis. Their understanding and support guided me through this process. I also want to thank Dr. Michael Buckley for all of his words of encouragement and most of all for his friendship. Thank you Mike, you have made a difference in my life by teaching me patience. I would also like to thank my mentor, Dr. Joseph Citron. Your influence in my life, Joe, is a dissertation in itself.

I would also like to thank my best friend, business partner, and future Ph.D., Troy Walden. I simply say to you my friend, "Whooped em again Josey." I would also like to thank my parents, Everett and Linda Platt, whose guidance and love I am constantly trying to duplicate to my own children.

A special thanks to my grandfather, Arthur J. Van Arman Jr., and to my Aunt Ruth DeWitt, who passed from this earth in May of 2003 for a much better place. Grandpa, you once told me that no matter what you do with your life, you should always be the best at it. I have lived by those words since you told them to me; you are truly an inspiration in my life. Aunt Ruth, I know you are smiling at me, I can feel it. You once told me that you had faith in me and I could accomplish anything that I wanted to if I applied myself. Thank you Aunt Ruth, as usual you were right!

Finally, I would like to thank my wife, Elaine, and my children, Allison and Landen. I can now say to you those three words that you have been longing to hear, "no more school." I love you guys.

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CHAPTER I

INTRODUCTION

The State of Texas had lead the nation in alcohol related fatal crashes in 2000 with 1,898 (NHTSA 2000 *Traffic Safety Facts*) and in 2001 with 1,789 (NHTSA 2001 *Traffic Safety Facts*). The most alarming statistic of all may be that alcohol was involved in 50% of all Texas traffic fatalities in 2000 (NHTSA 2000 *Traffic Safety Facts*) and 48% of all Texas traffic fatalities in 2001 (NHTSA 2001 *Traffic Safety Facts*).

Alcohol-related traffic fatalities are not just a problem in Texas, but also are a problem nationwide. In 2000, there were 17,380 alcohol-related crash fatalities, which accounted for 40% of all traffic fatalities for the entire year (NHTSA 2000 *Traffic Safety Facts*). The 17,380 fatalities in alcohol related crashes during 2000 represent an average of one alcohol related fatality every 32 minutes (NHTSA 2000 *Traffic Safety Facts*). The consequences of drinking and driving can also cause injuries. An estimated 310,000 persons were injured in crashes where police reported that alcohol was present-this is an average of one person injured approximately every 2 minutes (NHTSA 2000 *Traffic Safety Facts*). Alcohol-related crashes affect every single American. About 3 in every 10 Americans will be involved in an alcohol-related crash at some time in their lives (NHTSA 2000 *Traffic Safety Facts*).

The style and format of this dissertation follows that of the *American Educational Research Journal*.

One method to decrease alcohol-related crashes may be increased and effective enforcement of the impaired driving laws by law enforcement. This includes the proper administration of the Standardized Field Sobriety Tests (SFSTs) as suggested by the National Highway Traffic Safety Administration/International Association of Chiefs of Police. When properly administered by a trained police officer, the SFSTs have been proven in validated studies to be more than 92% accurate at identifying drivers whose blood alcohol concentration (BAC) is at or above .08 percent (Stuster & Burns, 1998; Burns & Dioquino, 1997; Burns & Anderson, 1995).

For many years, peace officers have utilized field sobriety tests to determine the impairment of a person due to alcohol influence. The performance of the person evaluated by the field sobriety tests was used by the peace officer to develop probable cause for the arrest and as evidence in court. A wide variety of field sobriety tests existed and there was a need to develop a battery of standardized valid tests (NHTSA SFST *Instructors Manual* 2002). In 1975, the NHTSA contracted with the Southern California Research Institute (SCRI) to determine which roadside field sobriety tests were the most accurate (NHTSA SFST *Instructors Manual* 2002). SCRI traveled to law enforcement agencies throughout the United States to select the most commonly used field sobriety tests. In the initial stages of the research, six different and individual tests were used. Laboratory research in controlled conditions indicated that three of these tests, when used

in conjunction and administered in a standardized manner, were a highly reliable battery of tests for distinguishing BACs above 0.10 (NHTSA SFST *Instructors Manual* 2002).

The three field sobriety tests chosen were the Horizontal Gaze Nystagmus (HGN), the Walk and Turn (WAT), and the One Leg Stand (OLS). NHTSA analyzed the laboratory test data and found: HGN, by itself, was 77% accurate, the WAT test was 68% accurate, and the OLS test was 65% accurate in predicting BACs above 0.10. NHTSA research then combined the results of the three tests and determined that an 80% accuracy rate could be achieved for predicting BACs above 0.10 using these three field sobriety tests (NHTSA SFST Instructors Manual 2002). The final phase of the NHTSA study was conducted in the field. Standardized procedures were then developed for the peace officers to follow while administering the field sobriety tests in the field. The three field sobriety tests were found to be highly reliable in identifying subjects with a BAC above 0.10. The results of the combined study with the laboratory and the field tests validated the SFSTs. Subsequent SFST validation studies have been done in Colorado in 1995 (Burns & Anderson, 1995) Florida in 1997 (Burns & Dioquino, 1997) and San Diego, California in 1998 (Burns & Stuster, 1998). The Florida and San Diego studies validated the SFSTs at a BAC of .08.

Peace officers use the SFST battery of validated tests to develop probable cause for the arrest of the intoxicated driver during the pre arrest-screening portion of the DWI detection process (Burns, 1999; Moskowitz et al., 2000; Moskowitz & Fiorentino,

2000). The SFSTs are divided attention tests. They measure an individual's ability to conduct both physical and mental tasks, the same tasks which are used when operating a motor vehicle. Studies have been specifically done on divided attention tests and their correlation with impaired driving (Brewer and Sandow, 1980; Buikhuisen & Jongman, 1972; Moskowitz, Burns, Fiorentino, Smiley & Zador, 2000).

The SFSTs are also important in identifying the impaired driver with a BAC below .08 (Dees, 2001; Hingson, Heeren, T & Winter, 1996; Hingson, Heeren, Winter, 2000; McCain, Hollings, Shuster, B & Oberstar, 2000; McCartt, 2001). A peace officer's ability to detect and arrest the impaired driver with a low BAC can save lives. The SFSTs are valid and reliable tests for roadside use in the examination of DWI suspects. When used in conjunction with the overall DWI detection process, which includes observations of driving, the driver's appearance and attitude, odors, and speech, the SFSTs help the peace officer to remove impaired drivers from the nation's roadways and save lives.

Peace officers receive specialized NHTSA training in the administration of the SFSTs. The peace officer is taught to administer and score the Horizontal Gaze Nystagmus (HGN), Walk and Turn (W&T), and One Leg Stand (OLS) tests in a standardized manner. Once the peace officer completes the 24-hour SFST practitioner course, he becomes a certified SFST practitioner and can administer the SFSTs in the field and testify to their validity in court proceedings. The SFST practitioner course teaches the

peace officer to detect, investigate, and arrest the DWI driver. The peace officer is taught the three DWI detection phases, vehicle in motion, personal contact and pre-arrest screening (NHTSA SFST Instructor Manual 2002). The proper and standardized administration and scoring of the SFSTs are also taught during the practitioner course.

The peace officer must administer and score the SFST battery in a proper and standardized manner. Recent case law has stipulated that the SFSTs must be administered and scored exactly as specified in the NHTSA SFST training curriculum or they become inadmissible or inherently unreliable in court proceedings (State v. Homan, 2000; U.S. v. Eric Horn, 2002; New Mexico v. Lasworth, 2001). The current SFST training curriculum has a design that is not very aggressive in long-term retention of the competencies. Only 11 hours of the 24-hour SFST course directly relate to the administration and overall scoring of the SFST battery. The techniques of daily practice, over learning, and systematic repletion have been shown to increase retention, but are non-existent within the SFST curriculum (NHTSA, 2002; Farr, 1987; Rose, McLaughlin, & Felker, 1981; Arthur, Bennett, Stanush, & McNelly, 1998; Evans & Tufano, 1982).

The Texas SFST program offers peace officers the option of establishing “proficiency” in the administration of the SFSTs. Upon completion of the 24-hour SFST practitioner course, the peace officer may choose to submit 35 documented SFST field test evaluations to the Texas Engineering Extension Service Law Enforcement & Security Training Division (TEEX-LESTD).

The SFSTs must be administered in the field and the results must be documented on the evaluation form. The individual SFSTs are administered and scored by the peace officer. Upon completion and scoring of the SFST battery, the peace officer must predict if the participant's BAC is above or below the .08 BAC level. The prediction must be validated with a breath sample. The breath sample may be provided by a preliminary breath tester (PBT) or on the Intoxylizer 5000 breath testing instrument. The participants do not have to be under arrest for an alcohol-related violation, voluntary participation is allowed.

The Texas peace officers are required to submit the completed 35 field test evaluations within a six-month period following the completion of the 24-hour SFST practitioner course (TEEX/LESTD/TxDOT course policy and procedures). The SFST state coordinator may also grant the police officer a six-month extension to complete the 35 field test evaluations. This will allow the peace officer one year (maximum) from the completion of the 24-hour SFST course to administer and score the 35 field test evaluations; document the results and return the field test evaluation form to TEEX-LESTD for approval by the state SFST coordinator.

Statement of the Problem

The death and injuries associated with alcohol-related crashes continue to be a factor every year. Traffic fatalities in alcohol-related crashes rose slightly (by 0.4%) from 17, 380 in 2000 to 17,448 in 2001 (NHTSA 2001 *Traffic Safety Facts*). Injury from alcohol-

related crashes were also prevalent in 2001. An estimated 275,000 persons were injured in crashes where police reported that alcohol was present-an average of one person injured approximately every 2 minutes (NHTSA 2001 *Traffic Safety Facts*). Law enforcement agencies recognize that the impaired driver must be taken off the streets to ensure the safety of other drivers. Approximately 1.5 million drivers were arrested in 2000 for driving under the influence of alcohol or narcotics. This is an arrest rate of 1 for every 130 licensed drivers in the United States (NHTSA 2001 *Traffic Safety Facts*). Law enforcement has been the deterrent against the impaired driver, but the number of alcohol-related crash fatalities continues to rise each year.

The consequences of a law enforcement officer's failure to properly identify the intoxicated driver could result in serious injury or even death to innocent drivers and passengers on Texas roadways. Failure to properly identify the intoxicated driver may also result in possible civil or criminal actions filed against the officer and the law enforcement agency. BAC studies at .08% (BAC) document that enforcement at lower BAC levels save lives (Dees, 2001; Hingson, Heeren & Winter, 1996; Hingson, Heeren & Winter, 2000; McCain, Hollings, Shuster & Oberstar, 2000; McCartt, 2001). The validity of the SFSTs are directly related to the retention and the proper administration and scoring of the tests by the peace officer.

"It is necessary to emphasize the SFST validation applies only when:

- The tests are administered in the prescribed, standardized manner

- The standardized clues are used to assess the suspect's performance
- The standardized criteria are employed to interpret that performance

If any one of the Standardized Field Sobriety Test elements are changed, the validity is compromised" (NHTSA *standardized field sobriety testing student manual*, p VIII-19, 2002).

Purpose of the Study

The purpose of this study will be to evaluate the BAC predictions, specifically as indicated by the HGN results and retention of the Standardized Field Sobriety Test course objectives by Texas peace officers. To accomplish this purpose, the following objectives were developed. First, the study will not focus only upon selected peace officers in selected areas of the state with specialized training above the SFST practitioner course. This has been a prerequisite for past studies (Stuster & Burns, 1998; Burns & Dioquino, 1997; Burns & Anderson, 1995). Second, the 35 field test evaluations will not be conducted in a controlled or a monitored environment. The 35 field test evaluations will be gathered by peace officers as part of their regular duty assignments in the field.

Third, the data chosen for this study will be randomly selected from 35 field test evaluation forms submitted from 69 Texas peace officers. The study will also focus on the retention level of the SFST training objectives, specifically proper HGN predictions by the Texas police officers in the first and second three-month periods following the

completion of the SFST practitioner course. There are two questions that will be addressed:

1. Are Texas peace officers making accurate Blood Alcohol Concentration (BAC) predictions (above or below .08 BAC) based upon the observation and scoring of the clues of the Horizontal Gaze Nystagmus (HGN) test gathered during the administration of the Standardized Field Sobriety Tests in the field?
2. Is there a significant difference in the competency and retention levels of the Texas police officers based on HGN observations and predictions of above or below .08 BAC in the first three-month and second three-month periods following the completion of the SFST practitioner training?

Operational Definitions

Blood Alcohol Concentration (BAC): The percentage of alcohol in a person's blood. Alcohol concentration is defined in terms of the weight of ethanol (Ethyl alcohol) in a volume of blood or breath. In the United States the typical measure is grams of ethanol in 100 milliliters of blood or in 210 liters of breath.

DWI: The acronym "DWI" means driving while intoxicated. This term refers to any and all offenses involving the operation of a vehicle by a person under the influence of alcohol and/or drugs.

Divided Attention Test: A test that requires the subject to concentrate on both mental and physical tasks at the same time.

DWI Detection Process: The entire process of identifying and gathering evidence to determine whether or not a suspect should be arrested for a DWI violation.

Intoxylizer 5000: The recognized breath testing instrument used by the state of Texas.

Preliminary Breath Test (PBT): A pre-arrest breath test administered during the investigation of a possible DWI violator to obtain an indication of the person's blood alcohol concentration.

Peace Officer: A peace officer licensed by the Texas Commission on Law Enforcement Standards and Education (TCLEOSE).

Standardized Field Sobriety Test Battery: A battery of tests, Horizontal Gaze Nystagmus, Walk and Turn, and One Leg Stand, administered and evaluated in a standardized manner to obtain validated indicators of impairment based on NHTSA research.

TEEX/LESTD: Texas Engineering Extension Service Law Enforcement & Security Training Division. A part of the Texas A&M University System.

35 SFST Field Evaluations: Evaluations of the SFST battery voluntarily submitted by Texas peace officers upon completion of the SFST practitioner course.

Assumptions and Limitations

Assumptions

1. The Blood Alcohol Concentration (BAC) results were accurate.

2. The Preliminary Breath Tester was used correctly per departmental requirements.
3. The Intoxylizer 5000 was used correctly as per state requirements.
4. The peace officers administered and scored the Standardized Field Sobriety Test (SFST) battery correctly in the field.
5. The Blood Alcohol Concentration (BAC) prediction by the peace officer was made and documented after the Standardized Field Sobriety Test (SFST) battery had been administered.
6. All peace officer's had, at a minimum, been trained in the NHTSA Standardized Field Sobriety Testing (SFST) 24-hour practitioner course and had achieved "practitioner" status.

Limitations

The study will focus on the administration and retention of the Standardized Field Sobriety Tests (SFST), specifically the HGN test conducted by Texas peace officers. All data used for this study is self reported-data that was gathered in the field by the Texas peace officers during SFST evaluations. The peace officers were not observed by the researcher during the administration of the SFST battery. Even though there are a number of job assignments available in law enforcement departments, the years of experience and assignment of the peace officer will not be known. This study will focus on peace officer participation regardless of work experience and assignment. The race

and sex of each tested subject will also not be known, that information was redacted by TEEX prior to sending the data to the researcher.

Significance Statement

The results of this study will provide information for possible improvement of the Texas SFST training program. The study may indicate a need for more specialized SFST training to police officers. Furthermore, it may provide information and guidance for further research in impaired driving training programs not only in Texas but nationwide.

The study will not focus only on enforcement as related studies have. Accuracy of the BAC predictions based on the clues gathered during the administration of the SFSTs, specifically the HGN test, will be considered on a state-wide basis, not pre-selected areas as has been the case in previous studies. Retention and competency of the SFST curriculum and accuracy of the BAC predictions made by the police officers based upon observed clues of the HGN test will also be examined at three-month intervals following the initial SFST practitioner training course.

The study will use data submitted by Texas police officers who have submitted their 35 field test evaluations following the completion of the SFST practitioner course within a six month period. The pre existing data for the study will be randomly selected from the 35 field test evaluations submitted from the police officer. A total of 2,000 individual SFST evaluations will be used for this study. There will be no special consideration given to police officers based on years of service, geographic location, specialized impaired

driving training or assignment to specialized DWI enforcement units. The study will not focus on a particular law enforcement agency, size and location of the agency will not be considered.

CHAPTER II

REVIEW OF THE LITERATURE

A review of the literature that relates to the validity and reliability, correct administration, and retention of the SFST battery by peace officers begins with the history of impaired driving, physiological effects of alcohol, blood alcohol concentration, and the history of enforcement tactics in the identification of the impaired driver. The review will also cover the SFST development and validation studies and the importance of retention of the SFST administrative procedures in relation to law enforcement training and case law and how it relates to the reliability of the procedure.

History of Impaired Driving

Impaired driving costs money and lives. "For one of every 150 miles driven in Texas in 1999, a person with a blood alcohol concentration (BAC) >.08 sat behind the wheel. Police in Texas reported 24,865 crashes involving a driver or pedestrian with a BAC of .01 or more. Formulas developed by NHTSA were used to estimate the number of alcohol-related crashes where alcohol involvement was not reported by the police. An estimated total of 170,190 crashes in Texas involved alcohol which killed 1,751 and injured an estimated 63,500 people" (NHTSA 2002 *Impaired Driving Facts*).

While the possibility of death or injury on a Texas roadway due to an impaired driver may catch the attention of some, the costs associated with impaired driving, specifically dollars tend to paint a more realistic picture of the effects of impaired driving. "Alcohol

is a factor in 25% of Texas' crash costs. Alcohol-related crashes in Texas cost the public an estimated $10.3 billion in 1999, including $4.5 billion in monetary costs and almost $5.8 billion in quality of life lost. Alcohol-related crashes are deadlier and more serious than other crashes. People other than the drinking driver paid $6.3 billion of the alcohol-related crash bill" (Impaired Driving in the United States; Alcohol Costs Fact Sheets, 2002).

The public must realize that even though they are not physically involved in an alcohol-related crash, the monetary ramifications affect them in the future. To fully understand the monetary costs associated with the impaired driver, we must take a look at the costs per alcohol-related fatality/injury. "The average alcohol-related fatality in Texas costs $3.3 million:

- $1.1 million in monetary costs
- $2.2 million in quality of life losses

The estimated cost per injured survivor of an alcohol-related crash averaged $96 thousand:

- $48,000 in monetary costs
- $48,000 in quality of life losses" (Impaired Driving in the United States; Alcohol Costs Fact Sheets, 2002).

To put the costs of alcohol-impaired driving in perspective, take a look at costs per drink, "The societal costs of alcohol-related crashes in Texas averaged $1.10 per drink

consumed. People other than the drinking driver paid $.70 per drink" (Impaired Driving in the United States; Alcohol Costs Fact Sheets, 2002).

Physiological Effects of Alcohol

How does the introduction of alcohol affect the human body? "Ethanol is a Central Nervous System Depressant. It doesn't affect a person until it gets into their central nervous system, i.e., the brain, brain stem and spinal cord. Ethanol travels to the brain by getting into the blood. In order to get into the blood, it has to get into the body (NHTSA 2002 *standardized field sobriety testing student manual*, p. II-15). Alcohol affects the entire body and driving skills. "Alcohol is the most widely used drug and the one most often linked to motor vehicle accidents. There is no doubt, though, that since driving involves such basic skills as attention, judgment, perception, decision-making, physical reaction-and the ability to coordinate these skills-drivers under the influence of any behavior-or mood-altering drug may present a road safety hazard" (Facts About: Alcohol, other drugs, and driving; Addiction Research Foundation, 1992). Although the definitions of driving and drunk may vary, one thing can be agreed upon, alcohol and driving is involved.

"Alcohol" is the name given to a family of closely related and naturally-occurring chemicals. Each of the chemicals that are called an "alcohol" is made up of molecules that contain a single oxygen atom and varying numbers of hydrogen and carbon atoms. The simplest alcohol has only one carbon atom and four hydrogen atoms. The next

alcohol has two carbons and six hydrogens. The third alcohol has three carbons and eight hydrogens. The next one in the "chain" has one more carbon and two more hydrogen atoms than the one before. That is how the alcohols differ from one another" (NHTSA 2002 *standardized field sobriety testing student manual*, p. II-13).

While there are three recognized types of alcohol, which include, methanol, ethanol and isopropyl, only one type is used for human consumption. "The ingestible alcohol is known as ethyl alcohol, or ethanol. Its chemical abbreviation is ETOH. The "ET" stands for "ethyl" and the "OH" represents the single oxygen atom and one of the hydrogen atoms, bonded together in what chemists refer to as the "hydroxyl radical." Ethanol is the variety of alcohol that has two carbon atoms. Two of ethanol's best known analogs are methyl alcohol (or methanol), commonly called "wood alcohol" and isopropyl alcohol (or isopropanol), also known as "rubbing alcohol" (NHTSA 2002 *standardized field sobriety testing student manual*, p. II-14).

Blood Alcohol Concentration

The question always arises, when is a person deemed to be impaired? If a person consumes alcohol and drives, are they impaired and if they are, how is the impairment measured? "The amount of alcohol in a person's body is measured by the weight of the alcohol in a certain volume of blood. This is called the blood alcohol concentration, or "BAC." Because the volume of blood varies with the size of a person, BAC establishes an objective measure to determine levels of impairment" (NHTSA, Setting limits, Saving

lives, DOT HS 809 241, April 2001 p.1). When is a person impaired? At what BAC level should a person not operate a motor vehicle? At what BAC level is it ok for a person to operate a motor vehicle? Opinions vary in reference to levels of impairment by alcohol and at what level alcohol impairment begins. "Alcohol impairs some driving skills beginning with any significant departure from zero BAC. By BACs of 0.05 g/dl, the majority of the experimental studies examined reported significant impairment. By 0.08 g/dl, more than 94% of the studies reviewed exhibited skills impairment" (Burns & Stuster, 1998).

Is the BAC limit of .08 the "magic" number? Can a person with a BAC below .08 still be impaired? "Setting the BAC limit at .08 is a reasonable response to the problem of impaired driving. At .08, virtually everyone is impaired to the point that driving skills are degraded" (NHTSA, Setting limits, Saving lives, DOT HS 809 241, April 2001). Alcohol is a "drug" that is classified as a central nervous system depressant. It is no surprise that alcohol tops the list of drugs of abuse in most countries, and too much drinking is a well known cause of reckless behavior. Drunk drivers are frequently involved in crashes and deaths on the highway and alcohol intoxication is also responsible for many accidents within the home and in the workplace.

History of Enforcement Tactics

"Since September 11, 2001, drunk drivers have killed more people than actually died on that day. Not to take anything away from the tragedy of September 11, but drunk driving deaths are happening every day in America" (Advocates Seek to Rejuvenate Fight Against Drunk Driving, "Criminal Justice Funding Report; Arlington, VA: Capitol City Publishers, July 3, 2002, pp. 4-5).

Peace officers are the first link in the series of events that brings a DWI driver into the criminal justice system. Unless peace officers are able to detect and arrest impaired drivers, those drivers will not experience the sanctions which are intended to deter impaired driving. Although there are many aspects to effective DWI enforcement, certainly it is crucial for officers to be proficient in assessing the alcohol impairment of drivers they detain at roadside.

Law enforcement has two basic methods of dealing with the impaired driver; they are saturation patrols and sobriety checkpoints. Saturation patrols are simply defined as attacking an area known for high DWI incidents with a more visible patrol effort. Sobriety checkpoints are defined as procedures in which law enforcement officers restrict traffic flow in designated areas so they can check drivers for signs of alcohol impairment. All states do not use sobriety checkpoints as a deterrent; they are not used in Texas. Both strategies have been significant in the apprehension of the impaired driver, however

many issues face the law enforcement agencies such as the legality of the enforcement technique and of course funding and resources.

Development of the SFST Battery

"During the late 1960s and early 1970s more than 50,000 people lost their lives each year on our nation's public roads; more than half of the fatalities involved an alcohol-impaired driver" (Burns & Moskowitz, 1977). Until the mid 1970s, law enforcement around the country used many different types of field tests to determine a persons "sobriety." The sobriety tests were not consistent and ranged from blowing up a balloon to picking up loose change off the hood of a vehicle. Because of the lack of uniformity among law enforcement sobriety tests, the National Highway Traffic Safety Administration (NHTSA) sponsored a 1977 study (Burns & Moskowitz, 1977) in which researchers were asked to identify a battery of tests that could be used throughout the country.

A variety of tests were used in the laboratory study, but three specific tests were chosen by the researchers. The three tests included the walk-and-turn test, the one-leg stand test and the alcohol gaze nystagmus test, later called the horizontal gaze nystagmus test. These three tests were identified by the researchers to be the most reliable, accurate, and practical tests for the purpose of law enforcement. Another NHTSA-sponsored study (Tharp, Burns & Moskowitz, 1981) developed a standardized set of scoring and administration protocols for the three tests. The standardized protocols were developed to

promote consistency in the use of the tests by law enforcement officers in the field during the investigation of impaired driving offenses. NHTSA training protocol requires that law enforcement officers follow the SFST standardized protocols exactly, otherwise the accuracy and the validity of the tests are compromised, "It is necessary to emphasize this validation applies only when:

- The tests are administered in the prescribed, standardized manner
- The standardized clues are used to assess the suspect's performance
- The standardized criteria are employed to interpret that performance.

If any one of the standardized field sobriety test elements is changed, the validity is compromised" (NHTSA 2002 *standardized field sobriety testing student manual* p.VIII-19).

California Study (Lab)

In 1977, NHTSA awarded a contract to three researchers at the Southern California Research Institute (SCRI) located in Los Angeles, California. Beginning in 1975, the researchers at SCRI rode with law enforcement officers in several states to evaluate the different types of sobriety tests that law enforcement was utilizing. The SCRI researchers eventually chose six tests along with four alternate tests that would be the focus of the 1977 NHTSA study. The 1977 research study was conducted in two phases and consisted of three objectives:

- "To evaluate currently used physical coordination tests to determine their relationship to intoxication and driving impairment.
- To develop more sensitive tests that would provide more reliable evidence of impairment, and
- To standardize the tests and observations and thus give police more consistent evidence for use in court" (Burns & Moskowitz, 1977).

Two hundred thirty eight volunteers and ten police officers representing four law enforcement agencies in the Los Angeles, California area participated in the laboratory study. The participants were classified as either light, moderate, or heavy drinkers and were randomly assigned to target BAC levels appropriate to their classification. Each officer examined approximately 23-24 of the volunteers in a controlled laboratory environment. Each officer was observed by an SCRI staff member. The BAC of the participant was not known as separate members of the SCRI staff handled the alcohol dosing and the breath testing of the participants.

The participants were administered six tests by the participating officers:

- One Leg Stand
- Finger To Nose
- Finger Count
- Walk and Turn
- Tracing (a paper and pencil exercise)

- Nystagmus (called “alcohol gaze nystagmus”)

Each officer received one day’s training in the administration and scoring of the tests prior to conducting the experiment.

From the data gathered, the SCRI researchers found that using the scores from all six tests a participant’s BAC could be classified as being above or below 0.10 about 83% of the time. The researchers also found that this same level of reliability could be achieved by just considering the scores on nystagmus, walk and turn, and the one leg stand. The overall conclusion of the research was that the three-test battery made up of the horizontal gaze nystagmus, walk and turn and the one leg stand clearly appeared to offer a very reliable field sobriety testing procedure. The tests were not standardized in their final form. Standardization was achieved in the next phase of research.

The objectives of the next study also conducted by SCRI were as follows, “The study objectives were to:

(1) standardize the administration and scoring procedures for the three-test battery

(2) determine the reliability and validity of the standardized test battery in the laboratory

(3) assess its feasibility, utility, and validity in the field” (Tharp, Burns & Moskowitz, 1981).

California Study (Lab and Field)

The 1981 study (Tharp, Burns & Moskowitz, 1981) was limited entirely to the three-test battery of the HGN, walk and turn and one leg stand. Two hundred ninety seven test subjects were given alcohol and the researchers reported that the law enforcement officers were able to classify 81% of the test subjects as to whether their BAC was above or below the .10 BAC level. The researchers also determined that a field research evaluation was needed and that future research should also focus on the attitude and the motivation of the participating law enforcement officers.

Colorado Study (Field)

The 1995 Colorado validation study (Burns & Anderson, 1995) is the study most cited as validating the SFSTs under actual field conditions. The Colorado study was also funded by NHTSA and was conducted by the Colorado Department of Transportation and SCRI. The principal researcher for SCRI in the Colorado study was Dr. Marcelline Burns. Dr. Burns stated, "It was necessary to develop study procedures which insured that decisions to arrest were based solely on roadside observations and SFSTs. Officers used only the three test battery, walk and turn, one leg stand, and horizontal gaze nystagmus" (Burns & Anderson, 1995). Law Enforcement officers from seven Colorado agencies submitted records from SFST roadside evaluations over a period of five months. The Colorado study was unique in that it focused on BAC levels of .05 and .10. "In the state of Colorado, motor vehicle operators are subject to arrest if they are found to be

driving with a blood alcohol concentration (BAC) of 0.05% or higher. At BACs of 0.05% or higher but less than 0.10%, they are charged with Driving While Ability Impaired (DWAI). At BACs of 0.10% and higher, the charge is Driving Under the Influence (DUI). These statutes reflect the evidence from both epidemiological and laboratory studies of alcohol impairment of driving skills (Burns & Anderson, 1995).

The Colorado validation study consisted of 234 participants who submitted BAC samples by breath or blood specimens. "The correctness of officers' decisions can be determined by measured BACs for 234 subjects. Breath or blood specimens were obtained either with instruments approved for evidential tests or with PBTs at roadside" (Burns & Anderson, 1995). PBTs are preliminary breath testers that are used by some law enforcement officers prior to arrest for an impaired driving offense. PBTs are not evidentiary in some states including the State of Texas. The Colorado study concluded that, "Overall, 86% of the officers' decisions to arrest or release drivers who provided blood or breath specimens were correct" (Burns & Anderson, 1995).

Florida Study (Field)

The Florida validation study (Burns & Dioquino, 1997) was also funded by NHTSA and was conducted by the Pinellas County Sheriff's Office (PCSO) and Anacapa Sciences, Inc. of Santa Barbara, California. Dr. Marcelline Burns served as the lead researcher for the project. The objectives of the Florida study were, "The design of the study was dictated by the need to insure:

1. Standardization of SFST administration and interpretation
2. Data integrity
3. Data completeness

The compromise of any of these requirements would have made interpretation of the obtained data both difficult and subject to question" (Burns & Dioquino, 1997).

The Florida validation study was conducted at a .08 BAC. "The Florida statute states that a person is guilty of driving under the influence of alcohol if he (1) "has a blood alcohol level of 0.08 or more grams of alcohol per 210 liters of breath" (Burns & Dioquino, 1997). The Florida validation study utilized specially trained law enforcement officers, "Participating officers were PCSO deputies with specialized training in DUI enforcement, including SFST training. They fully met all study criteria, and all were assigned to the PCSO Selective Traffic Enforcement Program (STEP)" (Burns & Dioquino, 1997). The Florida validation study consisted of 256 measured BACs "Evidential testing at the booking facility accounts for 210 of the BACs. Forty-six were obtained with a Preliminary Breath Testing (PBT) device" (Burns & Dioquino, 1997). The Florida validation study concluded, "The data obtained during this study demonstrate that 95% of the officers' decisions to arrest drivers were correct decisions. Furthermore, 82% of their decisions to release drivers were correct. It is concluded that the SFSTs not only aid deputies in meeting their responsibility to remove alcohol impaired drivers from

the roadway, they also protect the rights of the unimpaired driver" (Burns & Dioquino, 1997). The following is a summary of the Florida validation study:

Participants

Eight Pinellas County Sheriff's deputies, who had 6 to 19 years of experience and were trained in Standardized Field Sobriety Testing.

Study Arrest Disposition

Contacts with Citizens	379
SFSTs not administered	13
Other tests used	53
Records excluded	66
Records used in analysis	313
Alcohol analysis refusals	57
Measured BACs	256

Case Disposition Data

Fifty one of the 57 persons that refused alcohol analysis showed six clues for the HGN test. Additionally two subjects showed four clues. The average mean BAC for all 256 persons was 0.147.

Study Findings

Ninety five percent of the deputies' arrest decisions were found to be correct.

San Diego Study (Field)

The final SFST validation study was conducted in San Diego, California in 1997 and was reported in August of 1998 (Burns & Stuster, 1998). The San Diego study was also funded by NHTSA and was performed by Anacapa Sciences, Inc. of Santa Barbara, California. The authors of the study were Marcelline Burns, PhD and Jack W. Stuster,

PhD, CPE. The title of the study was "Validation of the Standardized Field Sobriety Test Battery at BACs Below 0.10 Percent."

The goal of the San Diego study was, "This study was conducted to evaluate the accuracy of NHTSA's Standardized Field Sobriety Test Battery in assisting officers to make arrest decisions at BACs above and below 0.08 percent under field conditions" (Burns & Stuster, 1998). The San Diego study consisted of seven selected officers from the San Diego Police Department's alcohol-enforcement unit. The study consisted of 298 data forms that were collected during the study period. The participating officers administered the three standardized field sobriety tests, the HGN, walk and turn and the one leg stand. The San Diego validation study, "Found that officers' estimates of whether a motorist's BAC was above or below 0.08 or 0.04 percent were extremely accurate. Estimates at or above the 0.08 level were accurate in 91 percent of the cases, or as high as 94 percent if explanations for ten of the false positives are accepted. Estimates at or above the 0.04 level (but below 0.08) were accurate in 94 percent of the relevant cases" (Burns & Stuster, 1998). The following is a summary of the San Diego validation study:

Participants

Seven members of the San Diego Police Department Traffic / DWI Enforcement Unit, who were trained in SFST and received a 4 hour refresher training course prior to field deployment. The following scoring guidelines were used:

4 Clues HGN	=	above 0.08
2 Clues HGN	=	above 0.04

Study Arrest Disposition

Citizen contacts	298
Records excluded	1
Records used in the study	297
Measured BACs	297
Arrests for DWI	217 (73%)
Received Warnings	65 (21.9%)
Received Citations	15 (5.1%)

San Diego Study Findings

Ninety one percent of the officers arrest decisions were correct.

HGN Alone

Officer prediction based on HGN alone was found to be 88% accurate overall.

Walk and Turn

Officer predictions based on the walk and turn test alone indicated an overall accuracy of 79%

One Leg Stand

Officer's predictions based on one leg stand alone were found to be 83% accurate overall.

SFST Scoring Protocol

"The concept of divided attention has been applied to psychophysical testing. Field sobriety tests that simulate the divided attention characteristics of driving have been developed and are being used by police departments nationwide. The best of these tests exercise the same mental and physical capabilities that a person needs to drive safely" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-2).

The SFSTs are comprised of the HGN, walk and turn, and one leg stand tests. In the NHTSA standardized field sobriety test battery, each test is scored separately. Each of the three tests, the HGN, walk and turn and one leg stand tests has a specified number of "clues" that determines alcohol impairment at or above a specified BAC level. For this study, the specified BAC level was .08. Since the San Diego study was the most recent study, it was used to establish the SFST scoring protocol for the data for this study. The police officers are taught in the SFST practitioner course that four clues on the HGN will be 88% accurate at predicting a BAC at or above .08. Any score of four clues (HGN) should result in the police officer predicting a BAC of .08 or above based upon the findings in the San Diego study for the tested subject prior to the breath test.

Standardized Field Sobriety Tests

Horizontal Gaze Nystagmus

"Horizontal Gaze Nystagmus (HGN) refers to an involuntary jerking occurring as the eyes gaze toward the side. Involuntary jerking of the eyes becomes readily noticeable when a person is impaired. As a person's blood alcohol concentration increases, the eyes will begin to jerk sooner as they move to the side" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-5).

When the police officer administers the HGN test, they are looking for three specific clues:

- "as the eyes move from side to side, does it move smoothly or does it jerk noticeably? (As people become impaired by alcohol, their eyes exhibit a lack of smooth pursuit as they move from side to side.)
- when the eye moves as far to the side as possible and is kept at that position for several seconds, does it jerk distinctly? (Distinct nystagmus at maximum deviation is another clue of impairment.)
- as the eye moves toward the side, does it start to jerk prior to a 45-degree angle?" (Onset of nystagmus prior to 45-degrees is another clue of impairment.) (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-6).

The police officer looks for the specific "clues" in each eye as they perform the HGN test. The maximum number of clues that may appear in one eye is three. The maximum total number for any suspect is six. The original research shows that if four or more clues are evident, it is likely that the suspect's blood alcohol concentration is above 0.10. With four or more clues present, this test is 77% accurate (Burns & Moskowitz, 1977).

Walk and Turn

The walk and turn is a test that has been validated through extensive research and is administered by the police officers as the second test in the SFST battery. The walk and turn test consists of two stages, (1) instructional stage and, (2) walking stage. "In the instructional stage, the subject must stand with their feet in heel-to-toe position, keep their arms at their sides, and listen to the instructions. The instructional stage divides the

subject's attention between a balancing task (standing while maintaining the heel-to-toe position) and an information processing task (listening to and remembering instructions" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-3). The second stage of the walk and turn test is the walking stage, "In the walking stage the subject takes nine heel-to-toe steps, turns in a prescribed manner, and takes nine heel-to-toe steps back, while counting the steps out loud, while watching their feet. During the turn, the subject keeps their front foot on the line, turns in a prescribed manner, and uses the other foot to take several small steps to complete the turn. The walking stage divides the subject's attention among a balancing task (walking heel-to-toe and turning); a small muscle control task (counting out loud); and a short-term memory task (recalling the number of steps and the turning instructions" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-3).

When the police officer administers the walk and turn test, they are looking for eight specific clues:

- can't balance during instructions
- starts too soon
- stops while walking
- doesn't touch heel to toe
- steps off line
- uses arms to balance

- loses balance on turn or turns incorrectly
- takes the wrong number of steps (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-4).

"Original research shows that if a suspect exhibits two or more of the clues, or cannot complete the test, the suspect's BAC is likely to be above 0.10. This criterion has been shown to be accurate 68 percent of the time" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-4).

One Leg Stand

The one leg stand test has also been validated through research and is administered as the third test in the SFST battery. The one leg stand test consists of two stages, (1) instructional stage and (2) balance and counting stage. "In the instructional stage, the subject must stand with feet together, keep arms at sides, and listen to instructions. This divides the subject's attention between a balancing task (maintaining a stance) and an information processing task (listening to and remembering instructions" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-4).

The second stage of the one leg stand test is the balance and counting stage. "In the balance and counting stage, the subject must raise one leg, either leg, approximately six inches off the ground, toes pointed out, keeping both legs straight. While looking at the elevated foot, count out loud in the following manner: "one thousand and one", one thousand and two", "one thousand and three" until told to stop. This divides the subject's

attention between balancing (standing on one foot) and small muscle control (counting out loud)" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-4).

When the police officer administers the one leg test, they are looking for four specific clues:

- sways while balancing
- uses arms to balance
- hops; and
- puts foot down (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-5).

"Original research shows that if a suspect exhibits two or more of the clues, or is unable to complete the test, it is likely that the BAC is above 0.10. This criterion has been shown to be accurate 65 percent of the time" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VII-5).

Limitations of the HGN Test

Nystagmus may be caused by other factors. The court case State v. Witte states, "Nystagmus can be caused by problems in an individual's inner ear labyrinth. In fact, irrigating the ears with warm water or cold water…is a source of error. Physiological problems such as certain kinds of diseases may also result in gaze nystagmus. Influenza, streptococcus infections, vertigo, measles, syphilis, arteriosclerosis, muscular dystrophy, multiple sclerosis, Koraskoff's Syndrome, brain hemorrhage, epilepsy, and other

psychogenic disorders all have been shown to cause nystagmus. Furthermore, conditions such as hypertension, motion sickness, sunstroke, eyestrain, eye muscle fatigue, glaucoma, and changes in atmospheric pressure may result in gaze nystagmus. The consumption of common substances such as caffeine, nicotine, or aspirin also lead to nystagmus almost identical to that caused by alcohol consumption (State v. Witte, 1992).

The peace officer is not expected to be a physician, and a complete physical exam of a suspect at roadside is not feasible. The peace officer qualifies the subject by checking for equal tracking and pupil size prior to the administration of the HGN test (NHTSA 2002 *standardized field sobriety testing student manual*, p.VIII-5). Because of the limited qualification process, nystagmus not related to alcohol may very well be present in an individual and be mistaken for HGN based on the smell of alcohol or other physical indicators such as red bloodshot eyes and slurred speech.

Impaired Driving Case Law

As an aid to their roadside decisions, officers rely upon a battery of tests, the SFSTs, to augment their general observations of a driver. At this point in time, no other tests have been shown to better discriminate between impaired and unimpaired drivers. Nonetheless, the battery, and in particular HGN, frequently is attacked vigorously during court proceedings. Thus, the examination of officers' decisions, based on the SFSTs, is of considerable interest.

If it can be shown that officers' reliance on the tests is misplaced, causing them frequently to err, then the officers, the courts, and the driving public need to be aware that the tests are not valid and that DWI laws are not being properly enforced. If, on the other hand, it can be shown that officers typically make correct decisions, based on the SFSTs, perhaps the legal controversy that has centered on them for more than a decade can be diffused and court time can be devoted to more substantive issues.

The SFST program is based upon the accurate administration and scoring of the three test battery. The importance of "correct" administration is described by NHTSA in the following manner, "It is necessary to emphasize this validation applies only when:

- The tests are administered in the prescribed standardized manner
- The standardized clues are used to assess the suspect's performance
- The standardized criteria are employed to interpret that performance

If any of the standardized field sobriety test elements are changed, the validity is compromised" (NHTSA 2002 *standardized field sobriety testing student manual*, p.VIII-19).

There have been several cases that are considered "landmark" decisions that are relevant to the admissibility of the SFSTs in court. Challenges have been made to the admissibility based on (1) scientific validity and reliability of the tests; (2) the relationship of the HGN test to specific BAC levels; (3) the training, experience and the application of the SFSTs by the officer's. The following court cases have made significant contributions to the SFSTs.

Ohio v. Homan (732 N.E.2d 952, OHIO 2000)

"This significant State Supreme Court case held that Standardized Field Sobriety Tests (SFSTs) conducted in a manner that departs from the methods established by the National Highway Traffic Safety Administration (NHTSA) "are inherently unreliable." The court determined that the administration of the SFSTs, including the one leg stand and walk and turn tests, must be performed in strict compliance with the directives issued by NHTSA. The court concluded that because the arresting officer admitted to not having strictly complied with established police procedure during the administration of the HGN and walk and turn tests, the results of the SFSTs must be excluded. In contrast with other court rulings, the Homan court found, "it is well established that in field sobriety testing even minor deviations from the standardized procedures can severely bias the results" (NHTSA 2002 *standardized field sobriety testing student manual*, pg. III-9,10).

The Homan decision was appealed to the Sixth District Court of Appeals with the following finding, "The court of appeals agreed that the trial court improperly admitted the results of the field sobriety tests as evidence of probable cause. The court of appeals held that Trooper Worcester did not strictly comply with standardized testing procedures in administering the HGN and walk and turn tests, these tests could not be the basis for probable cause to arrest" (State v. Homan, Ohio 2000).

Smith v. Wyoming (11 P.3d 931 2000)

"The State Supreme Court held a law enforcement officer may testify to the results of field sobriety tests (including HGN) if it is shown that the officer has been adequately trained in the administration and assessment of those field sobriety tests, and conducted them in substantial accordance with that training. The court further stated "deficiencies in the administration of the sobriety tests go to the weight accorded the evidence and not its admissibility" (NHTSA 2002 *standardized field sobriety testing student manual*, p. III-10).

State v. Blake (718 P.2d 171 Arizona 1986)

"This is a landmark ruling on HGN because it was the first case decided at a State Supreme Court. The Arizona Supreme Court found that HGN satisfies the Frye standards for evidence to corroborate, or attack, the issue off a suspect's impairment. However, the court did set standards governing the training of officers who would be qualified to testify about HGN, and the court explicitly ruled that HGN cannot be used to establish BAC quantitatively in the absence of a chemical test" (NHTSA 2002 *standardized field sobriety testing student manual*, p.III-9).

Emerson v. State (880 S.W.2d 759 Texas 1994)

The Emerson case was the first Texas case affecting the Standardized Field Sobriety Tests. The court considered the admissibility of the SFSTs more specifically the HGN test during an appeal of the conviction by Sharon Emerson. The court concluded that if

the police officer was certified as an expert the HGN test was admissible. The court further concluded that if the police officer receives a "practitioner certification" from the state then he is considered an expert and may testify as such in court.

- Is admissible under the Texas Rules of Evidence
- A police officer must qualify as an expert on the HGN test, specifically concerning its administration and technique, before testifying about a defendant's performance on the test
- HGN is admissible to prove intoxication.

Training and Retention of the SFST Battery

"Training and development focus upon the improvement of the knowledge, skills, and abilities (KSAs) of individuals" (DeSimone & Harris, 1998, p. 8). The SFST practitioner course consists of a 24-hour training program for law enforcement officers. The training program is specific to identifying and arresting the impaired driver, "Training involves a process of providing KSAs specific to a particular task or job" (DeSimone & Harris, p. 8). The training process must meet the needs of the organization, such as law enforcement, "Personnel training and development is a process that has the potential of developing human expertise required to maintain and change organizations. As such, T&D may be strategically aligned to its host organization. It also has the potential of developing the expertise required to create new strategic directions for the host organization" (Swanson & Holton, 2001, p. 226). The SFST practitioner training allows

the peace officer to develop new skills that can not only benefit the peace officer on the street, but can also benefit the overall law enforcement organization.

"The goal of training goes beyond ensuring that the trainee learns the task or material being presented. It is equally important that newly learned material is retained" (DeSimone & Harris, p. 67). DeSimone and Harris also state, "Three additional issues that bear directly on what can be done to maximize retention are the meaningfulness of material, the degree of original learning, and interference" (DeSimone & Harris, p. 67). The SFST practitioner course provides information that is specific to law enforcement, over-learning is also practiced in the SFST practitioner course with a focus on the importance of "standardization" and "correct administration" of the SFST battery. The importance of correct administration of the SFST protocol has already been stated. The courts agree that in order for the SFST battery to be considered a "validated" test, it must be administered properly. The SFST practitioner course addresses interference in the following way: the SFST practitioner course provides the peace officer with a new "tool" to use that has a scientific and research background. The SFST practitioner course is taught to law enforcement officers in a classroom setting. The peace officers are taught that impaired driving is a deadly and costly problem in our society. The peace officers learn that if administered correctly, the SFST battery can help them identify impaired drivers they may have otherwise failed to identify and released. The peace officers are

constantly reminded of the importance of the "standardized" material being taught to them.

There are several factors that may affect the retention of the SFST practitioner course taught to the peace officers. The SFST practitioner course is open to all currently licensed and commissioned Texas peace officers. The participants will have varying levels of experience. Many of the peace officers may have made hundreds of impaired driving arrests using methods they have obtained "over the years." There may also be peace officers in the course who have made very few or possibly no impaired driving arrests. This may be a problem in the retention of the learning. "First, materials or skills learned before the training session can inhibit recall of the newly learned material" (DeSimone & Harris, p. 68).

"Training design involves adapting the learning environment to maximize learning" (DeSimone & Harris, p. 64). The current SFST training curriculum has a design that is not very aggressive in long-term retention of the competencies. Only 11 hours of the 24-hour SFST course directly relate to the administration and overall scoring of the SFST battery. "At least six issues have been studied that relate to practice and learning. They include active practice; massed versus spaced practice sessions; whole versus part learning; overlearning; knowledge of results; and tasks of sequencing" (DeSimone & Harris, p. 64).

The SFST practitioner course is taught to Texas peace officers who are 21 years of age or older. "Although learning has been defined in a variety of ways, most definitions include the concepts of behavioral change and experience" (Merriam & Caffarella, 1991). The SFST practitioner course requires the peace officer to process knowledge through instruction. "Linking the acquisition and processing of knowledge to instruction has probably been most thoroughly developed by Gagne and Briggs (1979)" (Merriam & Caffarella, p. 130). Gagne and Briggs emphasize, "There are eight different types of knowledge, each of which has appropriate instructional procedures" (Merriam & Caffarella, p. 130). Gagne contends that there are eight different types of knowledge, with each one having appropriate instructional procedures, "The eight types of learning are signal learning, stimulus-response, motor training, verbal association, discrimination learning, concept learning, rule learning, and problem solving (Merriam & Caffarella, pp. 130-131).

Law enforcement is sometimes compared to "military" type organizations. Many law enforcement agencies follow the same structuring as military organizations. Gagne has addressed military training settings in his theories. Gagne also identifies nine instructional events in his theory and the corresponding cognitive processes:

- Gaining information (reception)
- Informing learners of the objective (expectancy)
- Stimulating recall of prior learning (retrieval)

- Presenting the stimulus (selective perception)
- Providing learning guidance (semantic encoding)
- Eliciting performance (responding)
- Providing feedback (reinforcement)
- Assessing performance (retrieval)
- Enhancing retention and transfer (generalization).

This teaching sequence can correspond to the SFST practitioner course:

- Gain attention (discuss importance of DWI detection)
- Identify objective – pose question (What is standardized field sobriety testing?)
- Recall prior learning (how do you currently identify DWI drivers)
- Present stimulus (define standardized field sobriety testing)
- Guide learning (demonstrate proper standardized field sobriety testing procedures to students)
- Elicit performance (have students demonstrate standardized field sobriety testing procedures)
- Provide feedback (evaluate student performance of the standardized field sobriety testing procedures)
- Assess performance (provide students with written and proficiency exams)
- Enhance retention/transfer (have students perform 35 SFST test cases for proficiency).

The SFST practitioner course follows the cognitive theory of learning.

Cognitive Learning Theory

Learning theorist	Gagne
View of the learning process	Internal mental processing, information processing, Insight, memory, perception
Locus of learning	Internal cognitive structuring
Purpose of education	Develop capacity and skills to learn better
Teacher's role	Structures content of learning activity
Manifestation in adult learning	Cognitive development Intelligence, learning, and memory as function of age Learning how to learn

Cognitive learning theory (Merriam & Caffarella, p. 136).

CHAPTER III

METHODOLOGY

The purpose of this study is to evaluate the accuracy and retention of the Standardized Field Sobriety Tests, specifically the HGN test administered by Texas peace officers in the field during the first six-month period following the successful completion of the SFST practitioner training. Two research questions were asked:

1. Are Texas peace officers making accurate Blood Alcohol Concentration predictions above or below .08 BAC based upon the observation and scoring of the clues of the Horizontal Gaze Nystagmus test gathered during the administration of the Standardized Field Sobriety Tests in the field?
2. Is there a significant difference in the competency and retention levels of the Texas police officers based on HGN observations and predictions of above or below .08 BAC in the first three-month and second-three month periods following the completion of the Standardized Field Sobriety Testing practitioner training?

To answer these questions, two procedures were used. First, a self-reporting instrument developed by the Texas Engineering Extension Service Law Enforcement & Security Training Division (TEEX-LESTD) was used by the Texas peace officers to observe and record the administration of the SFST battery in the field. The data from these observations were used in this study. The original instrument used in the field by the Texas peace officers included:

- the tested subject's name
- date the evaluation was performed
- tested subject's drivers license number
- HGN (Horizontal Gaze Nystagmus) clues
- W&T (walk and turn) clues
- OLS (one leg stand) clues
- officer prediction of above or below .08 BAC
- Test/BAC result

To accomplish this purpose, the following objectives were developed. First, the study did not focus only upon peace officers in selected areas of the state with specialized training in impaired driving detection. Second, the 35 field test evaluations were not administered and scored in a controlled or a monitored environment. The 35 field test evaluations were gathered by Texas peace officers as part of their regular duty assignments in the field. Third, the data chosen for this study was randomly selected from pre-existing 35 field test evaluations submitted from the entire State of Texas. Demographics and populations for the State of Texas are known. The study focused on the retention and competency level of the SFST practitioner training objectives, specifically the HGN test by the Texas peace officers in the first and second three-month periods following the completion of the SFST practitioner course.

Upon completion of the original 35 SFST documentation form, the Texas peace officer returns the completed form to the Texas state SFST coordinator, whom is employed by TEEX-LESTD. The self-reported data from the completed documentation form is then entered into the police officer's training records by TEEX-LESTD personnel and the peace officer is given an additional 16 TCLEOSE training hours and a certificate of "proficiency" in the administration of the SFST battery. There is no state requirement for Texas peace officers to complete the additional 35 SFST cases; it is done on a voluntary basis.

Instruments

The documentation form used in this study consists of the following information:

- Name (redacted)
- Date
- Drivers License or ID Number (redacted)
- HGN Clues
- W&T Clues
- OLS Clues
- Above or Below .08
- Test/BAC Result
- Evaluator/officer (redacted)
- Supervisor/agency coordinator (redacted).

Any and all information that may have identified the tested subject or the location where the subject was tested was redacted by TEEX LESTD prior to sending the completed documentation forms to the researcher.

Procedures

The Texas SFST program offers peace officers the option of establishing "proficiency" in the administration of the SFSTs. Upon completion of the 24-hour SFST practitioner course, the peace officer may choose to voluntarily submit 35 documented (SFST) field test evaluations to the Texas Engineering Extension Service Law Enforcement & Security Training Division (TEEX-LESTD).

The SFST battery must be administered and scored in the field and the results must be documented on the evaluation form after the administration of the SFST battery. Upon completion of the administration and scoring of the SFST battery, the peace officer must predict if the subject's BAC is above or below the .08 BAC level. The prediction must be validated with a breath sample, which is obtained after the administration of the SFST battery. The breath sample may be obtained by the use of a preliminary breath tester (PBT) or the Intoxylizer 5000, which is the State of Texas' recognized breath testing instrument. The participants do not have to be under arrest for an alcohol-related violation, voluntary participation by the test subjects is allowed.

The peace officers are required to submit the completed 35 field test evaluations within a six-month period following the completion of the 24-hour SFST practitioner course

(TEEX/LESTD/TxDOT course policy and procedures). The SFST state coordinator may also grant the peace officer a six-month extension to complete the 35 field test evaluations. This will allow the Texas peace officer one year (maximum) from the completion of the 24-hour SFST course to administer and score the 35 field test evaluations, document the results, and return the field test evaluation form to TEEX/LESTD for approval by the state SFST coordinator.

Population

An open records request was made to TEEX/LESTD for 100 pre-existing 35 test case evaluation data for this study. The data for this study was released by TEEX/LESTD with specific information on the forms redacted due to FERPA (Family Educational Right to Privacy Act) concerns. The redacted information will be identified in more detail in this Chapter. For the purposes of this study, the researcher requested 100 of the completed 35 SFST evaluation forms for a total of 3,500 individual evaluations. Upon receiving the evaluation forms, they were checked to ensure that the peace officer had completed the 35 SFST evaluations in the required six-month period following the completion of the initial SFST practitioner course. After the data was obtained, each evaluation was assigned a number (1-100). Random sampling was conducted by selecting each odd numbered test evaluation until 69 evaluations for a total of 2,415 data samples were obtained. One thousand data samples were taken from the first three-month period (A) following the initial SFST practitioner course and an additional 1,000 data samples were taken from the second three-month period (B) following the completion of the SFST practitioner course. The total data set for this study was 2,000

self-reported SFST evaluations completed by the peace officer within a six-month period of completing the SFST practitioner course. The data was entered by the researcher into an Excel spreadsheet as two sets, A (first three months following SFST practitioner training) and B (second three months following SFST practitioner training). The 2000 samples were then used as the final data set to be analyzed for this study.

Design and Statistics

This research is descriptive by design and was conducted using quantitative research methods. Descriptive statistics with limited inferential statistics were used for analyzing the data, including the mean, median, standard deviation, frequencies, percentages of the data, and correlations (Gall, Borg, & Gall, 1996).

The statistical analysis of the data was performed using the Statistical Package for the Social Sciences (SPSS-11.5). The results of the statistical analysis were used to answer the two research questions. A probability level of .05 was used to establish statistical significance.

CHAPTER IV

RESULTS OF THE STUDY

The purpose of this study was to evaluate the accuracy and retention of the Standardized Field Sobriety Tests, specifically the Horizontal Gaze Nystagmus (HGN) test administered by Texas peace officers in the field during the first six-month period following the successful completion of the SFST practitioner training.

The objectives were to analyze the correctness of: 1) the BAC predictions of above or below the .08 BAC level based upon the number of clues gathered by the peace officer during the administration (pre and post three-month periods) of the SFST battery, specifically the HGN test to subjects in the field; 2) the accuracy of the SFST predictions, specifically the HGN test within the first and second three-month periods were also analyzed to determine if the competency and retention of the administration of the SFST battery differed in the three-month periods.

These objectives were accomplished by the use of: 1) a scoring protocol for the SFST battery established by the 1998 San Diego field test validation study of four clues observed on the HGN test alone were 88% accurate in predicting a subjects BAC was above .08 (Burns & Stuster, 1998). "The San Diego SFST field validation study was undertaken because of the nationwide trend towards lowering the BAC limits to 0.08. The question to be answered was "does SFST discriminate at BAC's below 0.10" (NHTSA *SFST Instructor manual*, 2002 p.VIII-4). The San Diego SFST study also states, "HGN is still the most reliable of the three test battery" (NHTSA *SFST Instructor manual*

2002 p.VIII-5). ; 2) an instrument of pre-existing data that recorded the SFST clues and the BAC prediction of the peace officer above or below .08 BAC; 3) a comparison of the peace officers predicted BAC based upon the number of clues gathered during the HGN test; and 4) a comparison of the peace officer accuracy of BAC predictions in the first and second three month periods following the initial SFST practitioner course. The findings of this research are presented in this Chapter, along with information about the population of the study and the techniques used for the gathering of the data for this study.

Population

The data for this study was gathered from pre-existing self-reported data in the form of completed 35 SFST evaluation forms submitted by Texas police officers to TEEX/ LESTD upon completion of the forms in the field. Gathering of the data for this study was accomplished by submitting an open records request for the data to TEEX /LESTD by the researcher. The data was released to the researcher after TEEX /LESTD administration redacted the following information from the 35 SFST evaluation forms in order to comply with the Family Educational Right to Privacy Act (FERPA) and Texas A&M University System protocols. The following information was redacted from the evaluation forms by TEEX/LESTD:

- Name (of tested subject)
- Drivers License or ID Number (of tested subject)
- Evaluator/officer
- Supervisor/agency coordinator

The data retained on the 35 SFST evaluation forms for this study was:

- Date (SFST evaluation was conducted)

- HGN clues (observed)
- W&T clues (observed)
- OLS clues (observed)
- BAC above or below .08 (Prediction by the peace officer)
- Test/BAC Results (obtained post-SFST administration and observation by the police officer using a PBT or the Intoxylizer 5000).

The location where the SFST evaluations were conducted and gender of the tested subjects is not known for this study. For the purposes of this study, the researcher requested 100 of the completed 35 SFST evaluation forms for a total of 3,500 individual evaluations. Upon receiving the evaluation forms, they were checked to ensure that the police officer had completed the 35 SFST evaluations in the requested six-month period following the completion of the SFST practitioner course. The data for this study was taken from 69 completed 35 SFST evaluation forms that met the criteria of the study for a total of 2,415 SFST evaluations. One thousand data samples were taken from the first three-month period (A) following the initial SFST practitioner training and an additional 1,000 data samples were taken from the second three-month period (B) following the completion of the SFST practitioner course. The total data set for this study was 2,000 SFST evaluations completed by the police officer within a six-month period of completing the SFST practitioner course. The data was entered by the researcher into an Excel spreadsheet as two sets, A (first three months following SFST practitioner training) and B (second three months following SFST practitioner training). The data was also analyzed by the researcher to determine if the BAC prediction (above or below .08) coincided with the number of clues observed by the police officer during the

administration of the HGN test. The police officers are taught in the SFST practitioner course that HGN is the most accurate of the three test battery and any tested subject that exhibits four or more clues of HGN will have a BAC above .08, 88% of the time, based on the San Diego SFST validation study. As discussed in chapter 2, the BAC prediction of the police officer observing four or more clues of HGN should be above .08 BAC for this study (see Table 1).

Research Questions

Question One

The first question asked was: Are Texas peace officers making accurate Blood Alcohol Concentration predictions (above or below the .08 per se level) based upon the observation and scoring of the clues of the Horizontal Gaze Nystagmus test gathered during the administration of the Standardized Field Sobriety Tests in the field?

To answer this question, BAC predictions for the entire six-month period were checked. The criterion was, four observable clues on the HGN test were needed by the peace officer to make a BAC prediction of .08 or above.

An analysis of the first research question (N=2000) indicates that Texas peace officers BAC predictions of above or below the .08 per se level, based upon the observation and scoring of the observed clues during the administration of the HGN test, are 92.8% accurate. This percentage was based upon the peace officer predicting a BAC level above .08 when four or more clues of HGN were observed (see Table 1).

Question Two

The second question asked was: Is there a significant difference in the competency and retention levels of the Texas peace officers based on HGN observations and predictions

of above or below .08 BAC in the first three-month and second three month periods following the completion of the SFST practitioner training?

An analysis of the second research question (N= 1000 pre and 1000 post) indicates that Texas peace officer's BAC predictions of above or below .08 based upon the observation and scoring of the observed clues during the administration of the HGN test are more accurate during the second three month period (94.0%) as opposed to the first three month period (91.6%). This percentage was based upon the police officer predicting a BAC level above .08 when four or more clues of HGN were observed (see Table 2). The mean BAC for this study was .114 (see Table 3) as opposed to the mean BAC for the San Diego SFST validation study which was .117. To answer these questions, BAC predictions for the six month and first three and second three months were checked for accuracy. The criterion was once again four observable clues on the HGN test were needed by the police officer to make a BAC prediction of 0.08 or above.

Table 1

Accuracy of Blood Alcohol Concentration (BAC) Predictions in Study Pre and Post Three Month Periods

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
HGNNEW * PRE_POST	2000	100.0%	0	.0%	2000	100.0%

HGNNEW * PRE_POST Crosstabulation

			PRE_POST		
			1	2	Total
HGNNEW		Count	1	0	1
		% within HGNNEW	100.0%	.0%	100.0%
		% within PRE_POST	.1%	.0%	.1%
	0	Count	83	60	143
		% within HGNNEW	58.0%	42.0%	100.0%
		% within PRE_POST	8.3%	6.0%	7.2%
	1	Count	916	940	1856
		% within HGNNEW	49.4%	50.6%	100.0%
		% within PRE_POST	91.6%	94.0%	92.8%
Total		Count	1000	1000	2000
		% within HGNNEW	50.0%	50.0%	100.0%
		% within PRE_POST	100.0%	100.0%	100.0%

Symmetric Measures(a)

	Value
N of Valid Cases	2000

a Correlation statistics are available for numeric data only.

Table 2

Accuracy of Blood Alcohol Concentration (BAC) Predictions in Study Pre and Post Three Month Periods

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
HGNNEW * PRE_POST	2000	100.0%	0	.0%	2000	100.0%

HGNNEW * PRE_POST Crosstabulation

			PRE_POST		
			1	2	Total
HGNNEW		Count	1	0	1
		% within HGNNEW	100.0%	.0%	100.0%
		% within PRE_POST	.1%	.0%	.1%
	0	Count	83	60	143
		% within HGNNEW	58.0%	42.0%	100.0%
		% within PRE_POST	8.3%	6.0%	7.2%
	1	Count	916	940	1856
		% within HGNNEW	49.4%	50.6%	100.0%
		% within PRE_POST	91.6%	94.0%	92.8%
Total		Count	1000	1000	2000
		% within HGNNEW	50.0%	50.0%	100.0%
		% within PRE_POST	100.0%	100.0%	100.0%

Symmetric Measures(a)

	Value
N of Valid Cases	2000

a Correlation statistics are available for numeric data only.

Table 3

Mean Blood Alcohol Concentration (BAC) in Study

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Test/BAC Result	2000	.000	.383	.11430	.064599
Valid N (listwise)	2000				

To answer these questions, a 35 SFST test case documentation form of pre-existing data was used. The form included six items oriented towards the effectiveness of the SFST administration process. These items were:

Item 1. The date on which the SFST evaluation was done.

Item 2. The number of horizontal gaze nystagmus (HGN) test clues obtained during the administration of the test by the peace officer.

Item 3. The number of one leg stand (OLS) test clues observed during the administration of the test by the peace officer.

Item 4. The number of walk and turn (W&T) test clues observed during the administration of the test by the peace officer.

Item 5. The BAC prediction of above or below .08 by the peace officer.

Item 6. The test/BAC result of the breath test administered by the peace officer.

The 1998 San Diego SFST validation study followed similar criterion to this research study. "Seven officers of the San Diego police department's alcohol enforcement unit were trained in the administration and modified scoring of the NHTSA SFST battery (i.e., Horizontal Gaze Nystagmus – HGN, Walk and Turn, and One Leg Stand). SFST scoring was adjusted: the observation of four HGN clues indicated a BAC at or above .08 percent. During routine patrols, the participating officers followed study procedures in administering SFST and completing a data collection form for each test administered. The officers' final step in each case was the administration of an evidentiary breath alcohol test" (Stuster & Burns, 1998).

The San Diego SFST validation study was comprised of 297 participants with a mean BAC result of .117. The result from the San Diego study showed that with four or more clues observed, HGN is 88% accurate in predicting a BAC of .08 or higher. This study was comprised of 2000 individual self-reported SFST evaluations conducted by 69 Texas peace officers in the field after completing the SFST practitioner course. The participating peace officers were not required to have any type of specialized law enforcement training other than completion of the SFST practitioner course. The years of experience and job assignments of the peace officer's were not known to the researcher. The location of the SFST evaluations conducted in Texas was also not known to the researcher.

General Training Issues

The Texas SFST program is funded through a federal flow-through grant from NHTSA. The federal money is distributed to TEEX by the Texas Department of Transportation (TxDOT). TEEX/ LESTD is the administrator of the grant funds and schedules and coordinates all SFST training in Texas. TEEX /LESTD maintains all records of training including a database of SFST instructors whom deliver the SFST training to law enforcement agencies. A database of the peace officers who complete the SFST training is also maintained. The SFST training is provided to certified Texas peace officers at no cost, the instructors are compensated by the grant money for each SFST practitioner course they instruct.

Texas is comprised of many rural and urban settings, which present a problem to state-wide SFST training of Texas peace officers. Although the SFST training is free to

certified commissioned Texas peace officers, many law enforcement agencies are understaffed or comprised of a low number of peace officers. In many settings in the State of Texas, if one officer attends the SFST training for three consecutive days then there is no law enforcement left in the town. The SFST practitioner course consists of twenty four hours conducted on three consecutive days. The SFST practitioner training is comprised of 16 sessions, which include the following:

Session I – Introduction and Overview

- Goals and objectives of the course
- Course schedule and activities
- Demonstration of pre-knowledge (test) for the course

Session II – Detection and General Deterrence

- The frequency of DWI violations and crashes
- Defining general deterrence
- Describe the relationship between detection and general deterrence
- Describe a brief overview of alcohol
- Identify common types of alcohol
- Describe the physiologic processes of absorption, distribution and elimination of alcohol in the human body

Session III – The Legal Environment

- State the elements of the DWI offense
- Discuss the provisions of the implied consent law
- Discuss the relevance of chemical test evidence

- Discuss precedents established through case law

Session IV – Overview of Detection Note Taking and Testimony

- Describe the three phases of detection
- Describe the tasks and key decisions of each phase
- Discuss the uses of a standard note taking guide
- Discuss guidelines for effective testimony

Session V – Phase One: Vehicle in Motion

- Identify typical cues of Detection Phase One
- Describe the observed clues clearly and convincingly

Session VI – Phase Two: Personal Contact

- Identify typical clues of Detection Phase Two
- Describe the observed clues clearly and convincingly

Session VII – Phase Three: Pre-Arrest Screening

- Describe the role of psychophysical and preliminary breath tests
- Define and describe the concepts of divided attention and nystagmus
- Discuss the advantages and limitations of preliminary breath testing
- Discuss the arrest decision process

Session VIII – Concepts & Principals of the Standardized Field Sobriety Tests

- Discuss the development and validity of the Standardized Field Sobriety Tests
- Discuss the different types of nystagmus and their effects on the Horizontal Gaze Nystagmus test
- Discuss and properly administer the three Standardized Field Sobriety Tests

- Discuss and recognize the clues of the three Standardized Field Sobriety Tests
- Describe in a clear and convincing fashion and properly record the results of the three Standardized Field Sobriety Tests on a standard note taking guide
- Discuss the limiting factors of the three Standardized Field Sobriety Tests

Session IX – Test Battery Demonstrations

- Demonstrate the appropriate administrative procedures for the Standardized Field Sobriety Testing Battery

Session X – "Dry Run" Practice Session

- Demonstrate the proper administration of the three Standardized field sobriety Tests

Session XI – "Testing Subjects" Practice: First Session (Alcohol workshop)

- Properly administer the SFSTs
- Properly observe and record subject's performance utilizing the standard note taking guide
- Properly interpret the subject's performance
- Proper use and maintenance of the SFST Field Arrest Log

Session XI-A – "Testing Subjects" Practice: First Session (Option One or Two)

- This session is used for testing volunteers whom have consumed alcoholic beverages

Session XII – Processing the Arrested Suspect and Preparation for Trial

- Discuss the importance of correct processing and report writing procedures in DWI arrests

- Discuss the correct sequence of DWI suspect processing procedures
- Discuss the essential elements of the DWI arrest report
- Discuss the importance of pre-trial conferences and presentation of evidence in the DWI trial

Session XIII – Report Writing Exercise and Moot Court

- Discuss the required information on a narrative arrest report
- Successfully complete a narrative arrest report
- Discuss the need for competent courtroom testimony
- Demonstrate the proper techniques of courtroom testimony

Session XIV – "Testing Subjects" Practice: Second Session

- This session is used for testing volunteers whom have consumed alcoholic beverages

Session XIV-A – "Testing Subjects" Practice: Second Session (Video-taped workshop)

- This session is used if a videotaped alcohol workshop is used in the training

Session XV – Review and Proficiency Examinations

- Demonstrate knowledge and proficiency in administering the Standardized Field Sobriety Test Battery (100% proficiency must be demonstrated to the instructor)

Session XVI – Written Examination and Program Conclusion

- Pass a written examination (80% minimum)
- Provide comments and suggestions for improving the course (NHTSA 2002 *standardized field sobriety testing manual*)

The SFST practitioner course includes an overview of impaired driving and its effect on society as well as instruction on the administration of the SFST battery. The SFST practitioner course also consists of one or two live alcohol workshops in which volunteers are dosed with alcohol to a specified level of above or below .08. The dosed subjects are administered the SFST battery by the attending peace officers who administer and score the SFST test battery and make a BAC prediction of above or below .08 BAC. The actual BAC prediction is revealed at the end of the alcohol workshop so the peace officers can see if their BAC predictions were accurate.

Texas peace officers are given the opportunity after successful completion of the SFST practitioner course to administer and document 35 additional SFST evaluations in the field. The peace officers are given a six-month time period in which to complete the 35 SFST evaluations, an extension of six additional months can be given to the peace officer by the Texas SFST state coordinator. The 35 SFST evaluations are administered and scored by the peace officer in the field, the SFST battery is administered to a subject who has consumed alcohol; however, the tested subject does not have to be under arrest for an alcohol or any other violation by the peace officer. Upon completion of the administration of the SFST battery, the peace officer makes a BAC prediction of above or below .08. The tested subject must then submit to a breath test on a PBT or the intoxylizer 5000 for verification of the BAC level and the BAC is then compared with the officer's prediction and recorded on the 35 SFST evaluation form. The peace officers are not monitored while administering the SFST battery, so it is unknown if the SFST battery

is administered correctly or if the actual breath test is taken before or after the BAC prediction is made by the peace officer. There is also no requirement for special assignment or years of service to be eligible to complete the 35 SFST evaluations. The only requirements are that the peace officer is state certified and has satisfactorily completed the SFST practitioner course.

Upon completion of the 35 SFST evaluations, the evaluation form is sent to TEEX/ LESTD for evaluation by the SFST state coordinator who also enters the completed data into the TEEX/ LESTD database, upon a satisfactory review of the 35 SFST evaluation form, the peace officer will receive the status of "proficient" in the administration of the SFST battery, as well as an additional 16 hours of TCLEOSE law enforcement training credit. The 35 SFST evaluations may be denied by the Texas SFST coordinator for the following reasons:

- Refusal to give breath sample
- High number of clues with low corresponding BAC
- Low number of clues with a high corresponding BAC
- Wrong number of clues for the test evaluated
- Submitting too few test cases
- No clues listed on the evaluated sobriety test
- Wrong prediction of above or below the per se limit (.08)

If the evaluation form is not found to be correct, the form is sent back to the peace officer who must administer additional SFST evaluations and send them back to the Texas SFST coordinator for confirmation and approval.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Standardization and proper administration are important in the administration of the SFST battery. Supreme Court decisions such as Homan v. Ohio stress that if the validity of the SFSTs is compromised, then the results of the SFSTs are "inherently unreliable." In other words, the SFST test battery must be administered correctly each time or the results are unreliable, no exceptions. This study attempted to study accuracy of the BAC predictions using the HGN test at .08 and the retention of the SFST test battery during the first and second three-month periods following the completion of the NHTSA SFST practitioner course for the State of Texas.

The instrument for this study used pre-existing, self-reported data in the form of a 35 SFST test case documentation form that peace officers throughout the state of Texas must complete to obtain a "proficiency" status in the administration and scoring of the SFST test battery. The study focused on the entire State of Texas, a single geographic location was not selected due to the inability of TEEX/ LESTD to release such information on the 35 SFST test case documentation form.

Upon completion of the SFST practitioner course, the Texas peace officer is given the opportunity to obtain a "proficiency" status. The SFST practitioner must complete the 35 SFST test cases within six months of receiving the SFST practitioner certification course. If the SFST practitioner is not able to complete the 35 SFST test cases before the six-month period has expired, the practitioner may request an extension of up to a one-year

period from completion of the SFST practitioner course. The SFST practitioner must administer the three test SFST battery (HGN; W&T; OLS) to 35 individual subjects. The practitioner must record the observations made during the SFSTs and then predict if the subject will have a BAC above or below the .08 level. Upon completion of the 35 SFST test case documentation form, the form must be sent back to the SFST state coordinator for approval. If the 35 test case documentation form is rejected by the SFST state coordinator, it will be sent back to the practitioner. The practitioner shall resubmit additional SFST evaluations based on the number of evaluations that were incorrect. The 35 test case documentation form may be rejected for the following reasons:

- Refusal to give breath sample
- High number of clues with a low corresponding BAC
- Low number of clues with a high corresponding BAC
- Wrong number of clues for the test evaluated
- Submitting too few test cases
- No clues listed on the evaluated sobriety test
- Wrong prediction of above or below the per se limit of .08

The tested subjects for the 35 test case documentation form do not have to be under arrest, voluntary participation is acceptable. The breath sample of the test subjects must be obtained with a Preliminary Breath Tester (PBT) or on the recognized state breath testing instrument, the Intoxylizer 5000. The SFST state coordinator is responsible for forwarding the completed 35 test case documentation form to TCLEOSE so the police officer can receive 16 additional hours of law enforcement training credit.

Conclusions

The results of the statistical analysis of the population of SFST test evaluations show that the Texas peace officers were making the correct BAC prediction after the administration of the SFST battery, specifically the HGN test 92.8% of the time. The San Diego SFST validation study showed the officer predictions to be correct 88% of the time based upon four or more clues observed during the HGN test. The results of the statistical analysis for this study also show that the Texas peace officers' predictions are more accurate in the second three-month period (94.0%) following the completion of the SFST practitioner training than in the first three-month period (91.6%) following the completion of the SFST practitioner training. The mean BAC for this study was .114 as opposed to the mean BAC for the San Diego SFST validation study which was .117. The San Diego study consisted of 297 participants, this study consisted of 2,000 participants.

The statistical analysis results for this study were comparable to the statistical analysis results for the 1998 San Diego SFST validation study.

Recommendations

The SFST practitioner training should focus primarily on the administration and scoring of the standardized tests. As stated in chapter I, the current SFST training curriculum has a design that is not very aggressive in long-term retention of the competencies. Only 11 hours of the 24-hour SFST course directly relate to the administration and overall scoring of the SFST battery. More hours in direct administration and scoring of the SFST's may be necessary. The overall validity of the SFSTs absolutely depends upon the peace

officers following the established, standardized procedures demonstrated to them in the SFST practitioner training.

My recommendation for the Texas peace officer who has achieved the SFST practitioner status is to submit 35 SFST evaluations on a bi-yearly basis, as well as attend SFST update training every two years. I would also recommend that the current SFST practitioner training program focus on the administration and the scoring of the SFST standardized protocol. In reality, Chapters 5-8 of the SFST practitioner course could comprise the entire SFST practitioner training curriculum. These chapters address the phases of detection involved in the DWI detection process, as well as the concepts and principals of the SFSTs. The current SFST curriculum consists of 15 chapters of information including chapter 16, which is the final examination for the course.

By focusing on the detection phases and the concepts and principals of the SFSTs, the peace officer would have more time to actually demonstrate and administer the SFST battery in front of a qualified instructor who could correct any deficiencies. The Texas peace officer must exhibit a 100% mastery of the SFST battery to pass the practitioner course. The current SFST practitioner course curriculum covers information such as the cost of alcohol-related crashes, which is important information, but it is information that the peace officer could receive through course handouts.

The legal and general deterrence are also sessions that the peace officer may or may not use based upon his department size and location. This also holds true for the report writing, testifying and processing sessions in the student manual. These sessions are not being overlooked as being insignificant to the DWI detection process; however these

skills will vary from department to department. Many law enforcement agencies in Texas have their own policies and procedures for detecting and processing DWI drivers, and the peace officers must follow the department policies and procedures.

Future Research

One area of future research is to focus only on the administration and scoring of the walk and turn (W&T) and the one leg stand (OLS) tests. This study focused upon the HGN test as the "most" reliable of the three test battery. I believe this is a true statement since a BAC prediction of above .08 will always contain observed HGN clues and may or may not contain the W&T and the OLS test clues. The SFST battery is focused upon "dividing" a suspect's attention between physical and mental tasks. The physical and mental tasks are more prevalent in the W&T and the OLS and are scored accordingly. The HGN test, although it is described in the NHTSA curriculum as a "divided attention" test, the clues for the HGN test are only observed in the suspect's eyes. The W&T and the OLS tests require the suspect to "physically" perform a task such as walking and balancing. My concern is that physical limitations may adversely affect some people to adequately perform these tests. NHTSA addresses the physical limitations that a peace officer may encounter during the investigation of a possible DWI driver. NHTSA only addresses a suspect's age (65 years or older) and a suspect's weight (50 pounds or more overweight). It is unknown what research standards NHTSA used to determine if a person was 50 pounds or more overweight.

Conducting a research study focusing only on the subject's performance on the W&T and the OLS tests could determine the significance of "physical performance" on the

SFST battery without the HGN test. This study could also benefit the SFST program by using a "control" group of subjects who had consumed no alcohol so the results could be compared with the subjects who had consumed alcohol.

Improving the Study

The following suggestions are made for improving this study if it were replicated. After receiving and analyzing all of the data for this study it became apparent to the researcher that direct observation of each peace officer administration of the SFST battery would benefit the study. Being able to identify the geographical location of each SFST evaluation could possibly identify training deficiencies that exist in selected areas of the state of Texas and the results could be used to improve the NHTSA SFST practitioner training program in Texas.

The study should also focus on a time period of more than six months as this study did. The retention or depletion of the SFST training could be measured yearly and then compared to the six-month statistics in this study. Observation of the administration of the SFST battery could also benefit the study as the retention of the curriculum could be measured against the actual skills demonstrated by the peace officer during the administration of the SFST battery. In essence, being able to evaluate the administration of the SFST battery by the peace officer could also give a more accurate analysis of the retention of the SFST training.

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APPENDIX A

DWI DETECTION AND STANDARDIZED FIELD SOBRIETY TESTING DOCUMENTATION FORM

DWI DETECTION AND STANDARDIZED FIELD SOBRIETY TESTING DOCUMENTATION FORM

NAME:_____
SOCIAL SECURITY NUMBER:_____
DATE OF BIRTH:_____

DEPARTMENT:_____
DEPARTMENT ADDRESS:_____
PHONE NUMBER:_____

HOME ADDRESS:_____
HOME PHONE NUMBER:_____

STANDARDIZED FIELD SOBRIETY TESTING COURSE INFORMATION

LOCATION:_____
DATES ATTENDED:_____
INSTRUCTOR:_____

DATE COMPLETED FIELD EVALUATIONS:_____
SIGNATURE:_____

*__NOTE:__ In order for the field evaluations to be accepted, the impaired individual being tested must complete all three standardized field sobriety tests. No field evaluations will be accepted without a numeric BAC obtained by either a breath or blood sample (PBT readings are acceptable for field test results). The evaluator is responsible for collection of all data recorded on this document. Falsification of data will not be tolerated and persons doing so may be prosecuted under Texas law (PC 32.21).

SEND COMPLETED DOCUMENTATION FORMS TO:
TEEX-LAW ENFORCEMENT TRAINING DIVISION
JOHN B. CONNALLY BUILDING
301 TARROW
COLLEGE STATION, TEXAS 77840-7896
ATTENTION: SFST PROGRAM COORDINATOR

STANDARDIZED FIELD SOBRIETY TESTING DOCUMENTATION FORM

Name (Last, First, Middle Initial)	Date	DL or ID Number	HGN Clues	W&T Clues	OLS Clues	Above or Below .08	Test/BAC Result
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							

The listed names and information collected on this document are true and correct by witness of my signature. **Evaluator's Signature:_____**

Supervisor/Agency Coordinator's Signature:_____

STANDARDIZED FIELD SOBRIETY TESTING DOCUMENTATION FORM

Name (Last, First, Middle Initial)	Date	DL or ID Number	HGN Clues	W&T Clues	OLS Clues	Above or Below .08	Test/BAC Result
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

The listed names and information collected on this document are true and correct by witness of my signature. **Evaluator's Signature:**_____

Supervisor/Agency Coordinator's Signature:_____

APPENDIX B

SUPPLEMENTAL REFERENCES

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