HEART RATES OF LAW ENFORCEMENT OFFICERS

DURING DEADLY FORCE SCENARIOS

THESIS

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by

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Last but certainly not least… This thesis research project was developed with the health and safety of our law enforcement officers in mind. After serving with the United States Border Patrol for almost 30 years, my husband suffered a sudden and fatal heart attack. At that time, I knew that if given the opportunity, I wanted to make a difference in the lives of current and future law enforcement officers. This thesis is dedicated to my late husband, Mark R. Kemp.

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ABSTRACT

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SUPERVISING PROFESSOR: A. STEVEN DIETZ

Law enforcement officers are forced into stressful encounters when having to protect their lives and the lives of others. They must be at peak performance in these situations. An active shooting situation is among the most stressful law enforcement officers will encounter. One effect of stress is the increase of the heart rate, Beats per Minute (BPM). Motor skills, peripheral vision and depth perception are affected by an increase in the heart rate. There are advantages to knowing if experience, training, age and Body Mass Index (BMI) have an effect on the heart rate of the law enforcement officer during a deadly force encounter. The purpose of this study is to explore the relationship between law enforcement officer's years of experience and training and the officer's heart rate during a deadly force encounter scenario.

CHAPTER 1

INTRODUCTION

Law enforcement officers are forced into using deadly force when placed in situations that requires them to protect their lives and the lives of others. They must operate at peak performance when placed in these situations. An active shooting situation is one of the most stressful scenarios law enforcement officers will encounter. "The officer must maintain continuous vigilance, exercise sound judgment, assess threat level, and, if threat escalation warrants, rapidly change tactics to include force, on occasion lethal force" (Meyerhoff et al., 2004, 250).

Stress is a process that takes place when external stimuli place strain on a person thus causing psychological and/or physiological changes (Cohen, Kessler, & Gordon, 1997). One of the effects of stress is the increase in the heart rate. While stress can increase the amount of adrenaline making one stronger, it also deteriorates fine motor skills which determine precision and accuracy (Siddle, 1995). Motor skills, peripheral vision and depth perception are affected when there is an increase in heart rate.

Officers that have been involved in deadly force encounters have reportedly experienced auditory exclusion or diminished sound, visual narrowing or tunnel vision, the feeling of slow motion in time, detachment or dissociation and intrusive distractive thoughts (Artwohl & Christensen, 1997). During a force-on-force situation, all sensory faculties are necessary for peak performance in a life and death situation.

There are advantages to knowing what can contribute to the law enforcement officer controlling or maintaining his heart rate when faced with a deadly force encounter. There are advantages to knowing if experience and training make a difference in the elevation of the heart rate of law enforcement officers when placed in a deadly force scenario.

The Advance Law Enforcement Rapid Response Training (ALERRT) is based at Texas State University-San Marcos, Texas. The goal of this 16-hour two-day course is to aid patrol officers, specifically the true first responder, in their ability to respond, address, and stop an active shooter.

The ALERRT program has been training first responding police officers since 2002. This training was developed in response to those suspects who have sought out and killed innocent victims, a unique tactical challenge to law enforcement officers. These mass murderers are commonly referred to as "Active Shooters" since the Columbine High School tragedy in April of 1999.

A major component of the ALERRT program entails force-on-force, practical exercises, the main focus of this training program. Participants are divided into teams and practice the skills that they have learned through various homicide-in-progress scenarios. Teams assess an active shooter scenario, enter the building and take down the active shooter role players. Because this scenario is a homicide-in-progress, the officers know going in that they will be confronting an armed offender.

The officers and the active shooter role players are armed with Simunitions® weapons which fire soap based FX® marking cartridges, similar to paintballs. This realistic force-on-force training has proven to be much more beneficial than traditional

firing range target practice because in this scenario the target is shooting back (Olson, 1998).

Upon completion of the ALERRT scenario, veteran and novice officers interviewed during this study claimed that this training exercise was as close to "the real thing" as one could come. This consensus was attributed to the officers working together as a team, entering the building with an active shooting in progress, knowing that this could realistically happen in their towns and in their schools. The results from the Polar® Heart Monitors visually confirmed these testimonies.

Since this training scenario is reportedly close to "the real thing," it is the most realistic scenario available to capture the heart rates of law enforcement offices during a deadly force-on-force situation. The staff of the ALERRT program agreed that learning if training and experience can play a role in the law enforcement officer's capability to control their stress levels and heart rates would be of great benefit.

CHAPTER 2

LITERATURE REVIEW

Prior to the ALERRT program with the real life, force-on-force scenario, there has been little opportunity to study the effects or capture the heart rates of law enforcement officers during an actual force-on-force incident. The logistics of wearing a heart monitor and engaging it prior to a random active shooting has far-reaching impossibilities. Therefore, prior research found specific to the heart rates of law enforcement officers during an active shooter force-on-force incident was limited.

The apparent forerunner in the physiological effects of stress on the law enforcement officer has been Bruce Siddle (1995), and the research he presented in his book, *Sharpening the Warrior's Edge: the Psychology & Science of Training*. Siddle discusses survival stress reaction and how it affects the law enforcement officer when placed in a life or death situation, maximum stress indicator.

Survival stress reaction is based on the elevation of the heart rate. As low as 115 Beats Per Minute (BPM), fine complex motor skills such has finger dexterity (pulling the trigger) and eye-hand coordination plus multi-tasking becomes more difficult. However, Siddle also found that when the heart rate is 115-145 BPM, the gross motor skill reaction times are enhanced and maximized. These gross motor skills control the actions of the large muscle group such as the thighs, chest back and arms (Olson, 1998).

When the heart rate reaches 145 BPM, the complex motor skills begin to deteriorate. These complex motor skills require several complex skills working together in unison. For the law enforcement officer, these skills control their ability to track a moving target, which involves eye hand coordination, timing and balance.

The auditory system begins to shut down also at 145 BPM. The law enforcement officer cannot hear commands or warnings from his fellow officer at this point. Once the heart rate reaches 175 to 180+ BPM the law enforcement officer may enter the "deer in the headlight" state known as a state of hyper vigilance. Effectiveness begins to deteriorate which increases reaction time, placing the officer and his fellow officers in a critical situation (Siddle, 1995).

There is an almost immediate effect of the visual system in that at 175 BPM it becomes difficult to focus on close objects, visual tracking becomes difficult, and pupils dilate and flatten causing the tunnel vision effect (Siddle, 1995).

A study reported by the Force Science News Transmission (2004), confirmed that law enforcement officers participating in training scenarios similar to the ALERRT program training receive the same emotional and physiological effects as those in an actual shooting. This study was conducted in London, England with 48 male and female volunteers from London's SWAT unit. Heart rate monitors were worn to measure heart rates. The teams of three were armed with Glock 17s with Simunitions®. This is closely comparable to the ALERRT training scenario. The teams were placed in a scenario and unexpectedly found themselves in a realistically simulated altercation which involved a shooting. The heart rates among the officers exceeded 160 BPM when the shooting

began, doubling the normal heart rate. The purpose of this study included the validation that simulation training is of value due to the extreme stress arousal.

The law enforcement officer's requirement to be prepared when making deadly force decisions was discussed in a paper by Dean T. Olson (1998), of the Douglas County Sheriff's Department in Omaha, Nebraska. Olson cited Bruce Siddle's research on the effects of stress and elevated heart rates and the physiological consequences to the human body. He recommends that officers receive ongoing realistic simulation training. Through the practice of realistic force-on-force scenarios the law enforcement officer will be better trained to deal with the stressful real life situations that arise (Olson, 1998).

Michael Asken (2005), psychologist for the Pennsylvania State Police noted when discussing the psychological performance skills of the mentally prepared officer "mental factors accounted for 75% of the outcome, luck fell to 5%" (Asken, 2005, 1). Just as important as with the mentally prepared officer, the mentally unprepared officer's luck accounts for 75% of the outcome. Asken (2005) acknowledges that the average police officer is not exposed to developing emotional and psychological conditioning needed to deal with the much less mundane activities and does not have the opportunity afforded them to mentally prepare for a force-on-force encounter.

"Action pistol shooting induces acute elevation of heart rates and blood pressures" (Fenici, Ruggieri, Brisinda, & Fenici, 1999). The heart rates and blood pressures of six healthy adult athletes were recorded during competition pistol shooting. This study was completed to ascertain if there was indeed an elevation in the heart rates and blood pressures of law enforcement officers during competition pistol shooting. The mean heart rate was close to 100 BPM in all but one competitor. Four shooters' heart

beats reached about 180 BPM and in two cases the heart rate exceeded 200 BPM. The study demonstrated that during competition pistol shooting, even the healthy athlete will experience elevated heart rates which could affect the precision and outcome of the competition. It was recommended by this team of researchers that further studies be conducted to evaluate cardiovascular stress and the coping capabilities of the law enforcement officer.

A less relevant literature review was a news story that reported the findings of a study conducted in Italy. The study was to evaluate the effect of requiring high school and college athletes to have an EKG screening before they are allowed to compete in sports. The EKG screening was administered to rule out hidden heart problems for the purpose of lowering the rate of sports related sudden cardiac deaths (Johnson, 2006). The researchers from the University of Padua Medical School reviewed test results of athletes and non-athletes from the ages of 12-35 over a 25-year period. They found that since the adoption of the EKG requirement, sudden cardiac deaths among athletes had dropped by 89%. There was no change in the rate of the non-athlete. This review is worthy of mention in that there is a viable concern that could be addressed to screen law enforcement officers for heart healthy reasons, due to the fact that they are in a high stress induced profession.

Stress factors and anxiety studies have been completed in a varied arena. In the medical field, heart rates and anxiety have been measured by those individuals exposed to public speaking (Duncko, Makatsori, Fickova, Selko, & Jezova, 2006). Yes, public speaking triggers a stress response by those who have high anxiety traits as determined by psychological characterization.

Norwegian Navy officer cadets were placed in a simulated prisoner of war camp to measure symptoms of peritraumatic dissociation. Hardiness, which is the sub-dimension of challenge, was measured and found to be negatively associated with the peritraumatic dissociation. The data from this study indicated individual differences that affected military performance during high stress situations (Eid & Morgan, 2006).

In a separate study led by Eid (2004), 18 Norwegian sailors were placed in a disabled submarine exercise that lasted a week. A personality test was administered to the sailors to measure self-reported coping skills and hardiness prior to the beginning of the exercise. The study indicated that the highest level of stress was reported in the first 24 hours and dropping off as the coping skills took effect (Eid, Johnsen, Saus, & Risberg, 2004). Emotional stress was determined to possibly impair cognitive performance and decision-making. The results of this study reiterate the need for understanding during a force-on-force encounter. The highest level of stress is during the front end of the encounter when coping skills are less likely to play into the scenario.

Male law enforcement officer volunteers (n=412) were evaluated to see if cardio-respiratory fitness had any association with coronary artery disease risk factors. This study measured self-reported stress, cholesterol, blood pressure, and behavioral risk factors. It appeared that there was little correlation between cardio-respiratory fitness and physiological factors (Young, 1994). The moderating effect of cardio-respiratory fitness was not tested to the fullest extent possible. As with the study and recommendation of Fenici, Ruggieri, Brisinda, & Fenici (1999), cardiovascular stress and the coping capabilities of the law enforcement officers should be studied further.

Law enforcement personnel's performance was measured during a stress induced training scenario at one of the Federal Law Enforcement Training Centers. The participants were police trainees who volunteered to participate knowing that they would be evaluated on their survivability skills. Methods included the evaluation of emergency vehicle operation, an interactive scenario using simunitions, communicating a decision to use lethal force, ability to recall actions, and accuracy of using a weapon. The scenario included a hostage situation that involved shooting, communications and weapons malfunction. Ninety-seven percent of the officers failed as 70% of their rounds failed to hit the suspect. Nineteen percent of the officers shot the hostage. This study is worth noting in that the case for scenario based training is strengthened as stress was cited as the major factor in errors in shooting judgment (Meyerhoff, et al. 2004).

As indicated by this literature review, it appears that there is a lack of research in the area of controlling stress related elevated heart rates.

CHAPTER 3

METHODOLOGY

Hypothesis

Law enforcement officers with the most training/experience will have a lower average and maximum heart rate than their less trained/experienced counterparts during force-on-force scenarios.

Methodology

The subjects of this study were active certified law enforcement officers participating in the Advance Law Enforcement Rapid Response Training (ALERRT). Prior to participation, the officers were given a synopsis of the study and the opportunity to opt out. Forty-one (41) law enforcement officers, all male, voluntarily participated in the study over the course of two separate training sessions. Each officer completed a demographic questionnaire and an Informed Consent to Participate form.

The Polar® Heart Monitor was used in this study to capture the maximum and the average heart rates by Beats Per Minute (BPM) of each individual officer participating in the force-on-force scenario. A monitor was placed on each officer at least ten minutes before the first scenario and activated by the investigator prior to the officer beginning the force-on-force scenario. Once the officer returned to the pre-scenario area, the monitors were stopped and the information was downloaded into a personal digital assistant (PDA).

Each scenario lasted approximately five minutes. The force-on-force scenario was followed by a group debriefing by the training officers, which generally entailed an additional ten minutes. During this study, the investigator did not enter the scenario area with the officers. Therefore, the Polar® heart monitors continued to capture the BPM even after the end of the scenario and through the debriefing segment of the training. This skewed the average BPM and therefore the average heart rates were not configured into the analysis process.

The questionnaire completed by each officer prior to participating in the study captured the following demographics: height, weight, age, gender, months of training, and years of experience. (APPENDIX) The training and experience included both law enforcement and military.

TABLE 1. Demographics of Participating Officers.

	Height	**Weight**	**Age**	**Experience**	**Training**	**BMI**
Minimum	63	130	22	1 year	0	20
Maximum	79	295	53	32 years	150 mos	42
Mean	70	201	35	11 years	23 mos	28
SD	3.23	38.02	7.30	6.92	36.8	4.92

The years of experience were grouped in categories: < 10 years (n=20), 10-19 years (n=16) and > 20 years (n=5). The months of training were categorized as zero months of training (n=12), 1-20 months of training (n=18) and > 20 months of training (n=11). The ages of the officers were grouped as 20-29 years old (n=11), 30-39 years old (n=21) and >40 years old (n=9).

The Body Mass Index (BMI) of the officers was not initially considered for the purposes of this study. However, since the needed information to calculate the BMI for each officer was available using the screening formula ($Wt/H^2 \times 703$); BMI was calculated and included in the analysis. The three categories of BMI were: normal (18.5-24.9), over normal (25-29.9), and obese (>30).

With regard to the ages of the officers it was predicted that the older the officer the more experience and more training they would have acquired due to time factors and the natural progression of life. By this stereotyping, it was also thought that the heart rate of the older officer would therefore stay within a lower elevated state.

Limitations of Presented Research

The Polar® heart rate monitor has a limit to the proximity between two or more transmitters. By the very nature of the ALERRT program training, officers are grouped closely together when entering the force-on-force scenario. With the proximity being so close, coding can be picked up by a fellow officer's transmitter and recording a false reading. With the present technology of the Polar® this is a limitation that cannot be readily corrected.

To capture a true average heart rate during the force-on-force scenario, the heart monitor should have been activated only during the time of the scenario. This investigator did not accompany the officers into the force-on-force scenario to deactivate the heart monitors at the conclusion of the scenario. The monitors continued to record the heart rates of the offices throughout the debriefing segment of the training. This skewed the average heart rate readings and therefore, these readings were not considered in the reporting of this research.

CHAPTER 4

FINDINGS AND RESULTS

ANOVA Single Factor measured the heart rates by Beats Per Minute (BPM) of the participating officers across four differing experimental conditions of training, experience, Body Mass Index (BMI) and age.

The differences between subjects on measure of heart rate (BPM) based on months of training was tested. Single Factor ANOVA across three differing experimental conditions of 0 months training, 1-20 months training and > 20 months training determined that the P-value ($P<.05$) is 0.127704 between the three groups. This is the indicator that there is no significant difference between the three groups.

TABLE 2. Differences Between Subjects and Measures of BPM Based on Months of Training.

Group	N	Average BPM	Maximum BPM	SD
No Training	12	163	176	11.4
1-20 months	18	185	234	28.5
> 20	11	181	251	40

Twelve officers reported that they had received less than one month of continuation/in-service training since beginning their career in law enforcement. These twelve officers had a maximum heart rate of 176 BPM with an average 163 BPM for the

group. Those eighteen officers who reported to have received a midrange of up to 20 months of training during their careers had a maximum heart rate of 185 BPM with six reaching 200+ BPM. Those officers who had received the most training during their careers of more than 20 months, three of the eleven had elevated heart rates of 200+ BPM. The heart rates were elevated across all there training groups.

The differences between subjects on measure of heart rate (BPM) based on their years of experience was tested. Single Factor ANOVA across the three differing experimental conditions of <10 years experience, 10-19 years experience and >20 years experience. The P-value (P<.05) is 0.595 and is the indicator there was no significant difference between these three groups.

TABLE 3. Differences Between Subjects and Measures of BPM Based on Years of Experience.

Group	N	Average BPM	Maximum BPM	SD
< 10 years	20	172	234	23.13
10-19	16	178	251	36.1
>20	5	185	225	29.89

Three of the officers in the group who had less than ten years of law enforcement experience represented one-third of those whose heart rates exceeded 200 BPM. Four officers in the group with 10-19 years of experience had maximum heart rates over 200 BPM. Finally, two of the five officers with more than 20 years experience reached maximum heart rates over 200 BPM.

The age of the officer was expected to correlate with the amount of training and experience. This was the case; the older the officer, the more experience was reported. However, the effect of age and experience in controlling the heart rate was not

happening. The age group of 20-29 years old had an average maximum heart rate of 177 BPM, the 30-39 year olds group had an average maximum heart rate of 175 BPM and the >40 year olds had an average maximum heart rate of 176 BPM. The P-value (P-value is <.05) is 0.99. The results of the BMI effect on the maximum heart rate had the widest spread of significance.

TABLE 4. The Age of Law Enforcement Officers and Maximum Heart Rates.

Group	N	Minimum BPM	Maximum BPM	Mean BPM	SD
20-29 years	11	159	251	177	25.57
30-39 years	21	147	234	175	28.15
>40 years	9	127	235	176	38.42

Looking at each grouping in the age category, it was noted that one officer (9%) in the youngest group of 20-29 year olds had a maximum heart rate over 200 BPM. Twenty-five percent (n=5) of those officers in the middle age group of 30-39 year olds had maximum heart rates exceeding 200 BPM. There were nine officers in the >40 year old grouping and three (33%) had maximum heart rates that exceeded 200 BPM.

The Body Mass Index (BMI) of each officer was calculated and a descriptive statistic analysis was conducted between three groups: BMI-normal (n=8), BMI-over normal (n=20) and BMI-obese (n=13).

The P-value (P<.05) was 4.56E-12 which concluded a significant difference between the three BMI groups. When factoring in the maximum heart rates however, the

ANOVA Single Factor measuring the maximum heart rates across the three BMI groups was anywhere but close to significance as the P-value was 0.958.

TABLE 5. Body Mass Index of Law Enforcement Officers and Maximum Heart Rates.

Group	N	Minimum BMI	Maximum BMI	Mean BMI	SD	Maximum BPM
Norm	8	19.5	24.3	22.4	1.84	234
Over	20	24.8	29.1	27.3	1.4	251
Obese	13	29.8	42.3	34.1	3.9	225

The Body Mass Index (BMI) was not to be factored into this study initially. After running the ANOVA Single Factor for the heart rates and training and experience and finding no significance, the BMI was calculated. Officers in all three BMI groups had elevated heart rates with nine officers reaching maximum heart rates of 200+ BPM. One officer had a normal BMI, six officers were overweight and two officers were obese.

The BMI factor did not seem to significantly affect the heart rates across the three groups of officers. Comparing the BMI and average maximum heart rates, the average maximum BPM was 175 across the three groups. Is this a good or is this bad for the officer?

Training, age and experience did not appear to have a controlling effect on the heart rates of the law enforcement officers in this study. It could be said that no matter how experienced a professional, or how many months of training received, the effect on the heart rate as an indicator of anxiety or stress was the same across the three experimental groups.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Law enforcement training officers have dealt with training issues for years trying to understand why the most comprehensive training does not prepare officers to perform at peak effectiveness in a survival situation. Training officers revise manuals, policy, training guidelines without understanding the physiological reasons that effect the officer's actions (Olson, 1998).

In conclusion, this study "The Heart Rates of Law Enforcement Officers During Deadly Force Scenarios," did not give a clear cut picture as to the effects that training, experience, age and Body Mass Index of the law enforcement officer has on the maximum heart rate when participating in a force-on-force scenario. The P-values indicated that there was no significance between these experimental groups and the elevation of the heart rates. The significance is that each individual officer has something physiologically going on that is allowing the heart rate to elevate to a level that is not conducive to effective and optimum performance during a deadly force-on-force encounter. Post shooting behaviors could be observed and noted in further research.

With past research indicating that scenario based training could reduce the anxiety associated with real life altercation; it is recommended that officers who have completed the ALERRT program be given the opportunity to attend follow-up training. The heart

rates of these officers should be captured to ascertain if the additional training is beneficial to the stabilization of the average and maximum BPM.

For future research considerations, the average heart rate should be captured during force-on-force training scenarios. This could be accomplished by the investigator accompanying the officers into the scenario arena and being there to stop the heart monitor at the conclusion of the scenario. This would capture a more accurate picture of the physiological aspects of the officer during the entire scenario, not just at the point of the maximum heart rate. If an officer's average heart rate sustains an elevated level, the more likely the motor skills, audio and visual conditions are affected.

It is further recommended that researchers consider the link between heart rates and cardiovascular fitness and take into consideration the overall health of the law enforcement officer. This would include requiring the officer to continue wearing the heart monitor for a recommended time period after the scenario to determine the recovery heart rate. A heart rate that is slow to recover could be an indicator of a more serious health issue. Training officers should consider the introduction of tactical breathing to control heart rates and enhance the effectiveness of motor skills

With the limited amount of literature and research in this area of focus, it is recommended that there be further in-depth study of the force-on-force training and the heart rates of the law enforcement officers involved. This further research could possibly open the door to live heart rate monitoring during actual hostage negotiations and active shooter incidents.

Further research into the reasons for elevated heart rates and how the officer can

better maintain their heart rate during stressful situations should be continued for the sake of the safety and overall health of the law enforcement officer.

APPENDIX

INFORMED CONSENT FOR PARTICIPATION

Department of Criminal Justice, Texas State University

INTRODUCTION AND PURPOSE OF HEART RATE MONITORING

You have been asked to participate in a study to assess your heart rate. You will wear a Polar Heart Rate monitor during the Force on Force ALERRT training. Your participation is voluntary. Read this form and ask questions about anything you do not understand before you decide if you want to participate.

PROCEDURES

You are being asked to participate in the study of the effect of the years of experience and months of training on your heart rate. You must first:

Fill out a questionnaire regarding your health history.

Document your body weight, height, age, heart family history.

Wear the Polar Heart Monitor during the Force on Force training scenario.

Be measured for resting, maximum and average heart rates.

POTENTIAL RISKS OR DISCOMFORTS

* There is no physical risk in this experiment other than the normal risks associated with the ALERRT training.

* The tests in this investigation are standard screening tests to determine heart rates during the Force on Force training scenario. Subject records and results will remain anonymous.

* There are no psychological, social or legal risks associated with the evaluation of heart rates.

*** To ensure your safety, you must tell us about your current health and health history.**

*** Your personal information will be kept confidential. Your file will be kept in a cabinet stored in the Principle Investigator's office.**

POSSIBLE BENEFITS

The results from this investigation may help you:

Learn about your heart rate during force on force;

Learn about the effect of training and experience on your heart rate;

CONFIDENTIALITY

Your records will be kept private as much as the law requires. Personal information will be stored in a file cabinet in Melissa Kemp's Office until the conclusion and

acceptance of her Thesis, after which, it will be destroyed. We will ask for additional written consent from you if this data will be used for other research purposes.

The results of the fitness testing may be shared for scientific purposes but we will not give your name. When the results of the research are shared, no information will be included that would give away who you are.

TERMINATION OF TESTING

You are free to decide if you would like to take part in testing. If you choose not to take part, it will not prejudice your relations with Texas State University in any way. Also, should you choose to participate; you are free to discontinue participation at any time. In addition, the Principle Investigator may end your participation in testing without your consent if they believe that you may be in danger (i.e., based on physical symptoms experienced during the evaluations such as increased heartbeat, difficulty breathing, etc.).

AVAILABLE SOURCES OF INFORMATION

For questions you may have about your rights as a participant in this evaluation, please consult with:

Principle Investigator, Melissa L Kemp, Graduate Student
Phone Number: 512-245-1668

AUTHORIZATION

"I have read and understand this consent form. Questions concerning these procedures have been answered to my satisfaction by the Principle Investigator. I agree to participate in testing. I understand that I will receive a copy of this form. I voluntarily choose to participate, but I understand that my consent does not take away any legal rights in the case of negligence or other legal fault of anyone who is involved in this study. I further understand that nothing in this consent form is intended to replace any applicable Federal, state, or local laws. I also understand that I may withdraw from this study at any time without penalty."

Client's Name (Printed): _____

_____

Client's Signature: _____
Date: _____
Principle Investigator's
Signature: _____
Date: _____

Gender _____
WATCH NO: _____
Height (inches) _____
Weight_____
Age _____
Ethnicity _____
Do you or any member of your immediate family have a history of heart problems? (yes or no)

Total years of experience
Law Enforcement_____
Military_____

Training – number of months
Police Academy_____
Police Tactical/SWAT_____
Military Academy_____
Military Tactical _____

Have you been involved in a deadly force encounter? (yes or no)

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