

# SURVIVAL STRESS RESEARCH ABSTRACT

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## *Introduction*

The effects of stress on the body, have been researched by physicians, psychologists, and sport psychologists for many years. The medical literature is replete with studies which have addressed stress and physical/health concerns (Coyne and Downey, 1991; Desmond, 1980; Glass, 1977; 1976a; Karl and Cary, 1987; Lovallo, 1999; McGrath, 1970; Olson, 1998; Selye, 1974), the psychological dimensions of stress (Antonovsky, 1979; Desmond, 1980; Diamond and Rose, 1993; Selye, 1976b; Warshaw, 1979), and the impact of occupational stress on the body (Atdley, 1977; Fletcher, 1991; Hardy, Carson, and Thomas, 1989; Nelson and Burke, 2002; Peterson, 1999). Other studies have analyzed stress and human performance in athletic competition (Smith and Smoll, 1982; Hardy and Fazey, 1987; Hardy and Parfitt, 1991; Weinberg, 1990; Yerkes and Dodson, 1908).

Prior research in policing has demonstrated that police work is a stressful occupation (Esenbrug, 1975; Reese, 1986; Selye, 1978; Toch, 2001; Violanti, 1985; Violanti and Aron, 1995; Webb and Smith, 1980). The Department of Justice (1999) categorized police work as one of the most dangerous occupations. The specific factors related to stress in police work have been categorized as organizational practices as exhibited by administrators, the functioning of the criminal justice system, the public, and the work itself (Aron, 1992; Resse, 1986; Statton, 1978). Stressors inherent in police work include danger, shift work, public apathy, boredom, dealing with misery and death (Graf, 1986; Greefield, 1981; Selye, 1978; Kores, 1986; Spielberger, Westberry, Grier, and ). Sewell (1981) reported that of the 25 stressors identified in police work, taking a life in the line of duty, shooting someone in the line of duty, the violent death of a partner, or another officer, pursuit of armed suspect, and a duty related injury accounted for the top ten most cited police stressors.

While the research on police stress has primarily been focused on the "stressors" of police work, the research that examines the effects of "survival stress" (Siddle, 1984) on performance in use of force situations is lacking. The

purpose of this study was to analyze how stress impacts a police officer's perceptual, mental, and physical performance when confronted with a use of force situation. Empirical research is a critical component that can enhance officer survival training and this study was undertaken to gain a better insight into how stress effects officer performance so that officers may be better prepared to respond in use of force situations.

## *Survival Stress*

Stress has been described as both an environmental variable and an emotional response to a specific situation (Gould and Petlichkoff, 1987). McGrath (1970) designed a four-stage model to explain the process of how stress interacts with a person's response. The process involves a sequence of events that begins with an environmental demand on the person, his/her perception and placing value to the event, the mental response (decision-making) and physical response. Martens (1977) defined stress as a substantial imbalance between (environmental) demand and response capability, under conditions where the demand has important consequences. Combing McGrath's model and Martens' definition of stress, stress may be viewed as positive or negative, but the emphasis is placed on the situational environment, the individual's perception of the situation, and the ability to respond physically or mentally.

Building on Martens' definition of stress, Siddle (1995) defined survival stress in police work as a "deadly force threat perception that initiates the Sympathetic Nervous System discharge." This physiological event occurs in situations where an officer believes his life is an imminent threat of serious personal injury, or when the officer is responsible for protecting him/herself in a potentially life threatening situation. It can be marked by an officer's lack of confidence in his/her skill level to respond to the threat. Moreover, the SNS discharge is compounded when the officer's perception to respond to the threat is minimal. In law enforcement, survival stress can have a significant, diminishing impact on task performance in life and death

encounters. It can diminish an officer's hearing (auditory exclusion), vision (tunnel vision and loss of near vision), thinking process (cognitive displacement), and physical response (loss of motor control).

Siddle's survival stress mechanism is best known as the as "fight or flight" response adapted from Canon (1929). This automatic response is an adaptive response mechanism alerting an individual's body to danger and begins to prepare the body mentally and physically respond. The process is virtually uncontrollable and it dominates all voluntary and involuntary systems until the threat perception has been eliminated or avoided.

An environmental demand will be first processed through the officer's perception and the brain evaluates the degree of threat through an integrated network of regions in the brain involving the thalamus, amygdala, hypothalamus, hippocampus, and frontal lobes of the cortex.

During a survival stress event, information from the perceptual senses is routed to the thalamus and emotion is attached to the perception of the level of the threat through the amygdala, the body's alarm system (Ratey, 2001). In a non-spontaneous threat situation the threat is processed cognitively and physically, normally without difficulty. In a spontaneous, "startled," fearful situation however, the amygdala, which is "hard wired" for survival, primes the body with adrenaline for an automatic response. The triggering of the amygdala is directly responsible for what many consider (post-incident) as irrational responses; panic, flight, freezing in place, aggressive actions that utilize untrained skills, repeating an action time and again (a motor skill feedback loop) or an inappropriate physical response.

Responding to a threat activates all five senses and provides the brain with a steady stream of information (Ratey, 2001). As the brain tunes into the source of the threat the visual system is heightened and narrows if it is the dominate source of the information. This phenomenon is known as perceptual narrowing or selective attention. Hearing diminishes causing auditory exclusion. If hearing is the dominant source of information, when a loud sound occurs, visual exclusion may occur. Other senses may be tuned out which diminish the officer's ability to feel cuts, scratches, strikes, or bullet wounds.

SNS activation creates important tactical implications for the officer. Effects of survival stress on vision creates a perceptual narrowing or tunnel vision and peripheral vision is reduced by approximately 70 percent (Breedlove, 1995). This can cause threat cues to be missed. SNS activation also inhibits the ability to maintain near vision, the ability

to focus, the loss of depth perception, the loss of night vision, and the loss of monocular vision (Godnig, 2001; Siddle and Breedlove, 1995). All of these factors are significant in that they are likely to cause inaccuracy of shooting skills, limitations with physical skills, altered reaction time, and the inability to be aware of environmental surroundings, which may pose additional threats to the officer.

Activation of the SNS significantly can alter survival reaction time, which is defined as the process of perceiving a threat and initiating a survival response. Survival reaction time comprises four stages (Siddle, 1995, Ratey, 2001): perception of the threat, analyzing and evaluating the threat level, formulating a response selection, and initiating a motor response. Each stage must be completed in sequence and each stage is dependent on the former. These stages align with the effects of SNS and vision. As perception of the threat commences, vision narrows and the brain's ability to evaluate the threat level also diminishes. If impairment occurs in the first two stages, response selection and motor response are also impaired.

These four stages comprise a model which integrate the cognitive process and a physical response. The impact of SNS activation on cognitive deliberation and physical reaction time create tactical implications for the police officer. Survival reaction time may be increased by up to four times, the officer's ability to cognitively process information will be disrupted, causing a failure to develop a logical survival response. This can lead to a panic reaction, irrational behavior, and/or freezing in place.

The four stages of reaction time provides a model of understanding the effects of survival stress on officer performance and may be the single most important factor which affects a motor skill response. When the SNS is activated, physiological changes occur preparing for the automatic fight or flight mechanism. As blood flow is reduced to the hands deterioration of simple hand coordination occurs. Also, as heart rate increases and vision becomes impaired, reaction time increases which compromises the ability of the officer to use fine and complex motor skills. The implication of the stress reaction is that firearms accuracy, basic eye-hand coordination, and empty hand control capabilities deteriorate quickly. Techniques that are based on gross motor skill design are better suited to withstand survival stress and increase performance of the officer.

## *Methodology*

To study the effects of survival stress on officer performance during a use of force situation, Siddle (2003) through the PPCT Management Systems (PPCT) instructor network, surveyed police officers nationally. Since 1980, PPCT has been recognized as the world's largest research-based use of force training organization, and has certified over 60,000 instructors from policing, corrections, military, and private security agencies, in various subject control tactics.

During 2001 and 2002 PPCT use of force instructors distributed a 54-item survey to police officers, military personnel, and aviators attending a subject control instructor training program. The survey instrument was pre-tested with 30 officers (in 2001) prior to distribution and based on the initial assessment modifications to some of the questions were made. The survey was designed to solicit responses from the respondent regarding their perception of stress during a use of force encounter. Survey questions addressed six areas: selected officer demographics, physiological manifestations, perceptual distortions, mental processing, physical responses, and post-encounter survival stress manifestations.

A total of 619 surveys were collected and 560 were suitable for analysis. This paper reports on 440 responses (78%) by full-time sworn law enforcement officers who indicated they had been involved in a lethal force encounter (n=165, 29%) or a physical assault/control force situation (n=275, 49%). Responses were designed around the Guttman scale, allowing the officer to indicate a yes, no, or do not recall response to the item. Other items required the officer to respond by indicating recall of certain factors surrounding the event by answering, before, during, after, or do not recall. For example, officers were asked if they experienced tunnel vision before, during, or after the event. Survey findings of each group and comparisons between the groups are presented.

Respondent surveys reflect a broad geographical representation of the United States that includes the Southeast, Southwest, Midwest, and Northeast portions of country. Surveys were collected by a certified PPCT instructor conducting the training course and forwarded them to the central office for analysis. Descriptive statistics were used to examine the responses and are reported in this paper.

The focus of the research centered on examining the effects of stress during a use of force encounter by addressing the

following questions:

1. How does perceptual distortion effect officer performance?
2. How does stress impact the physical response of an officer?
3. What are the physiological effects of stress on officer performance?
4. How does stress impact the mental processing of an officer and his/her performance?
5. What are the implications of these findings?

Like other survey research there are limitations to the study. Efforts were made to control the sample bias, as the researchers did not select the respondents who attended the course. Course attendees, however, were sent to the course by an agency administrator and not pre-selected. While not all regions of the country are represented, a sufficient number of the respondents comprise a representative sample of the country. Some respondents may have omitted some questions due to poor memory or were inapplicable to the respondent's use of force situation. Therefore, the findings of the study reflect the respondent's best memory of the factors experienced during the encounter.

## *Findings of the Research*

### **Background of the Officers and Force Circumstances**

The respondent law enforcement officers came from diverse agencies including: municipalities (52%), Sheriff departments (21%), State Police (16%), other agencies (7%), such as campus police, hospital police, railroad police, or wildlife officers, and Federal agencies (4%). The average size of the department of the responding officer is considered small to medium sized, as 60 percent revealed their agency was from 1-100 sworn officers. The range of the average age of the respondent at the time of the incident was from 26-35 years old (57%) and the incident occurred within the last 24 to 48 months (77%) of completing the survey. Slightly over two-thirds of the encounters (67%) involved 2-3 officers, regardless of whether the incident involved lethal force or physical control.

Respondents revealed six common encounter circumstances where force was employed and they account for 94 percent of the total incidents. Arrests accounted for 33 percent, 21 percent involved disturbance calls, traffic stops accounted for 19 percent, 15 percent included responding to a mentally impaired subject, 8 percent were

for responding to a suspicious person call, and controlling a riot accounted for 4 percent. These encounter circumstances reflect consistent findings of the FBI's annual reports of officers killed and assaulted in the line of duty (2001) and the Ross study (1999) which analyzed common confrontations where citizen resistance was likely.

### Survival Stress and Perceptual Distortion

Perceptual distortions or selective attention can significantly impede the brain from processing threat information correctly, impeding an officer's appropriate survival response. Salas (1996) found that cognitive effects of stress may include narrowing of attention, tunnel vision, increased errors, longer reaction time to peripheral stimuli, and memory defects. Perceptual distortions, which involve cognitive processing, can include tunnel vision, visual clarity, auditory problems, color distortion, and time factors surrounding the incident.

Prior research on stress and officer performance identified various distortions an individual may experience while engaged in a stressful lethal force encounter. Artwohl and Christensen (1997) found in a survey of 72 police officers who had survived a lethal force encounter, that 88 percent experienced auditory exclusion, 82 percent experienced tunnel vision, 65 percent indicated visual clarity, 63 percent reported slowness in time, while 17 percent stated time increased. Hoing and Roland (1998) studied 348 shootings of the Los Angeles Sheriff's Department and found that 45 percent of the officers experienced tunnel vision, 62 percent reported slowness in time, while 20 percent stated time increased, and 51 percent indicated sounds were quieter. Klinger (1999) found in 80 officer involved shootings that 51 percent experienced tunnel vision, 56 percent reported visual distortions, 56 percent stated time slowed down, while 23 percent stated time increased, 82 percent indicated sound intensified, and 37 percent had a sense of heightened detail during the encounter.

Table 1, of this study, compares the perceptual distortions of officers involved in a lethal force encounter and officers involved in a physical force confrontation. The objective of this aspect of the study was to determine if the stress response was higher in events that were clearly more dangerous or lethal. For example, 65 percent of the lethal force officers experienced tunnel vision, while 55 percent of the physical altercation officers experienced tunnel vision. The officers reported that between 30 to 40 percent did not recall experiencing tunnel vision or recall the time duration of the event. Over one-third of the officers experienced auditory exclusion, while 41 percent of the lethal force officers and 59 percent of the physical force officers

reported not recalling auditory problems. A significant number of both officer groups did not experience color distortion, depth problems, nor loss of focus on the threat. With the exception of recalling auditory exclusion, the comparisons between the two officer groups do not indicate a significant variance in any measured stress variable.

These findings are consistent with the Hoing and Roland and Klinger studies. The findings are slightly different than the Artwohl and Christensen study, yet both reveal a significant number of officers experience perceptual distortions during a force encounter.

**STRESS & PERCEPTUAL DISTORTION**  
*table 1*

<i>Stress Variable</i>	<i>Lethal Force</i>	<i>Physical Altercation</i>
<b>No depth problem</b>	68	61
<b>No loss of focus on threat</b>	63	66
<b>No recall of closeness of threat</b>	76	83
<b>No color distortion</b>	80	93
<b>Experienced tunnel vision (during event)</b>	63	55
<b>Do not recall tunnel vision</b>	30	40
<b>Auditory exclusion during event</b>	41	38
<b>Did not recall auditory exclusion</b>	41	59
<b>Time slowed down</b>	64	55
<b>Time sped up</b>	6	5
<b>Do not recall time</b>	30	40

### Survival Stress and Physiological Responses

Physiological reactions to stress may include increase in pulse rate, heart rate, blood pressure, respiration, palms sweating, muscle tension, increase in cortisol and glucose levels, and other measures (Salas, 1996). The HeartMath Research Center (1999) measured the heart rate of officers after officers completed threat-based scenario training. On the average, it was shown, that heart rate remained elevated well above baseline for more than one hour after the scenario debriefing. Klinger (1999) found that 89 percent of

the officers experienced some form of physical response after involvement in a lethal force incident.

Table 2 reveals the physiological responses to survival stress. For each stress variable identified the lethal force encounter officers reported experiencing a reaction to the stressful event more frequently than the physical altercation group. For the lethal force group, experiencing a racing heart and sweaty palms before the incident occurred more frequently than experiencing it afterwards. Only 12 percent of the physical altercation officers reported experiencing their heart racing before the event, but 40 percent indicated their heart was racing after the incident. Both groups revealed they were more likely to experience feelings of nausea after the event and were likely to experience a dry mouth.

STRESS & PHYSIOLOGICAL RESPONSES  
table 2

<i>Stress Variable</i>	<i>Lethal Force</i>	<i>Physical Altercation</i>
<b>Auditory exclusion during event</b>	41	38
<b>Do not recall auditory</b>	41	60
<b>Heart racing before/after event</b>	30/27	12/40
<b>Experience dry mouth</b>	67	51
<b>Experience sweaty palms before/after event</b>	44/25	42/20
<b>Do not recall sweaty palms</b>	55	41
<b>Experience nausea during/after event</b>	20/68	18/41

### *Survival Stress and Thoughts, Emotions, and Memory*

The effects of stress can impact a person's ability to recall details of the event (Salas, 1996). DeQuervan, Roozendall, and McLaugh (1998) report that cortisol hormone released under stress, inhibits memory retrieval. The World Health Organization (1998) reveals that the effects of acute stress reaction, including temporary memory loss, may subside after hours or may last several days. Grossman and Siddle (1998) report that acute stress can create amnesia after a critical incident. The greater the trauma, the greater the impact of the post-incident amnesia will likely be.

Prior studies on police officer reactions to stress when engaged in a lethal force encounter have measured the impact of stress on thoughts, emotions, and memory. Artwohl and Christensen (1997) found 60 percent of the officers experienced memory difficulties, 36 percent reported distracted and intrusive thoughts, and 39 percent felt a sense of disassociation during the incident. Hoing and Roland (1998) reported that 22 percent of the officers experienced memory loss. Klinger (1999) found 30 percent of the officers revealed they felt a need to survive the encounter, 41 percent experienced fear for self, and 33 percent did not know the number of rounds they fired.

Table 3 reveals the impact of stress on thoughts, emotions, and memory. Almost one-third of the physical force officers and slightly over one-third of the lethal force officers experienced memory loss after the event. For a majority of the officers reporting memory loss, it took two sleep cycles (20/17%) to recall the event. More commonly, memory was restored between a few hours and one sleep cycle for both groups. Of the lethal force group, 42 percent compared to 36 of the physical altercation officers reported a triggering event assisted in the memory of the event, the most significant being a visual trigger. A significant number of both groups did not recall when the memory returned following the event.

With regard to thoughts during the incident, almost 50 percent of both groups thought about being sued and dying during the event (combining the two variables together). Thoughts about family and God or religion were infrequent. Neither group reported they experienced bizarre or thoughts of disassociation. Officers reported that they rarely experienced feelings of panic, but more frequently experienced anger, fear and anxiety. These findings are consistent with prior studies on the subject.

### Survival Stress and Survival Response

The impact of stress has been shown to effect motor performance (Ratey, 2001). Yerkes and Dodson (1908) proposed that arousal (stress) and performance were associated. Creating a model known as the Inverted-U hypothesis, they explained that as arousal increased, performance also increased to a certain point, but that continued increase in arousal would lead to a detriment in performance (noting a curvilinear relationship). Gould, Petlichkoff, Simons, and Vevera (1987) found anxiety to have a curvilinear relationship with pistol-shooting performance, supporting the inverted-u hypothesis.

The effects of stress on performance include the accuracy of task performance as well as speed at which they are

performed. The stress of noise appeared to affect not only cognitive processes but motor skills as well (Thackery and Touchstone, 1983). Artwohl and Christensen (1997) found that only 7 percent of the officers froze during the encounter and 78 percent responded automatically.

**IMPACT OF STRESS ON THOUGHTS, EMOTIONS AND MEMORY**

*table 3*

<i>Stress Variable</i>	<i>Lethal Force</i>	<i>Physical Altercation</i>
Thoughts of being sued	22	25
Thinking about family	15	11
Thought about God/religion	8	8
Experience bizarre/disassociation thoughts	15	7
Thoughts about dying	27	19
Experience anger	39	32
Fear	38	31
Anxiety	25	22
Calm	20	13
Panic	10	12
Experience memory loss	37	30
Memory restored within hours	10	15
After 1st sleep cycle	15	20
After 2nd sleep cycle	20	17
Do not recall when memory returned	50	59
Triggering event for memory after event yes/no	42/50	36/67
Visual	40	35
Smell	15	10
Noise	12	20
Combination	37	2

Table 4 reveals the impact of stress on physical survival response. A significant number of both groups of officers

reported that they were able to identify the nature of the threat, its seriousness, were able execute a complex motor skill, and did not lose eye/hand coordination. Physical force altercation officers, however, were somewhat less likely than lethal force officers to execute complex motor skills. In 66 percent of the events, the officers were required to respond with no warning or within a few seconds to the altercation. Only 20 percent of both groups report that they were caught off guard, observed the threat, but could not believe it.

**STRESS AND SURVIVAL RESPONSE**

*table 4*

<i>Stress Variable</i>	<i>Lethal Force</i>	<i>Physical Altercation</i>
Able to ID nature of threat	80	93
Able to ID seriousness of threat	87	78
Difficulty in forming a response	15	40
Able to execute complex motor skill	70	54
No warning to perceive threat	35	32
A few seconds to react to threat	31	44
Minutes to react to threat	10	6
Do not recall	24	18
Did not lose eye/hand coordination	75	58
Caught off guard	20	20
Saw threat could not believe it	20	18
Saw threat reacted automatically	56	34
Reacted based on training	75	49

Only 15 percent of lethal force incident officers experienced difficulty in forming a survival response, while 56 percent reported they responded automatically, and 75 percent revealed they reacted based on their training. Physical force altercation officers reported that 40 percent had difficulty in forming a response, 34 percent reacted automatically, and 49 percent reacted based on their training.

Officers engaged in a lethal force encounter were also asked to respond to additional items and these findings are

not reported in table form. In 52 percent of the events officers reported they were from 5 to 10 feet from the threat (estimated), 48 percent could not recall the estimated distance, 37 percent indicated they hit the threat, and 60 percent did not remember hitting the threat. Of these officers, 55 percent reported that they had completed simmunitions training and 80 percent indicated that they completed point-shooting training.

### *Discussion and Implications*

The purpose of this research focused on the psychological, physiological, and physical dimensions of the effects of survival stress during a use of force encounter. From the results of the data several themes and patterns emerge. Generally, the findings reveal that survival stress is associated with officer perception, the time required to respond, and physical performance, and are inter-related when faced with a spontaneous threatening attack.

These findings illustrate that the level of the threat perception of the officer and the time needed to forming a survival response is critical to responding to a level of threat and to overall survival in the field. Survival performance consists of three functions, sensory reception, cognition, and motor response. As the senses receive stimuli, the brain processes it and perceptions are formed, leading to a physical response strategy. Understanding the impact of stress and activation of the SNS on formulating the officer's perception is important in forming a survival response. When the stress of the situation impedes the officer's ability to process the first two functions, a survival motor response will be severely impaired.

At a secondary level, officer perception is also critical to the legal justification of the use of force (Graham v. Connor, 1989). In Graham, the United States Supreme Court outlined the criteria for evaluating excessive force claims which include: the severity of the crime, whether the suspect poses an immediate threat to the officer's or others safety, and whether the suspect is actively resisting arrest or attempting to evade arrest by flight. The Court emphasized that "objective reasonable" force must be judged from the perception of a reasonable officer on the scene, realizing that officers must make split-second decisions when faced with a force encounter. Questions of unreasonable force emerge when an officer is unable to articulate the legitimacy of his or her actions. Hence, understanding the impact of stress on perception and memory, and the time needed to formulate a response strategy are vital to courtroom and legal survival for the officer.

A continuing major theme of the study results observed

throughout many of the fields of inquiry, underscores the fact that stress and activation of SNS impairs memory. A number of officers experienced memory difficulties with varying pieces of the event. For example, some officers could not recall whether time sped up or slowed down; some could not recall experiencing auditory factors of the event, whether sounds intensified or were diminished; some could not recall experiencing tunnel vision; others did not recall experiencing sweaty palms; and a majority of the officers involved in a lethal force situation could not recall hitting the target nor recalled the estimated distance of the threat when firing on the target. For a majority of the officers who could recall the nature of the event, their memory was restored within hours or after two full sleep cycles (45% and 42%). Visual and noise were common triggers assisting in restoring memory recall.

Less than a third of both officer groups experienced depth perception problems, did not lose focus on the threat, and maintained the ability to identify the nature and seriousness of the threat.

A significant number however, experienced tunnel vision and auditory exclusion, while only a minority reported that their heart was racing during the event.

These findings underscore what Grossman (1995) and Siddle (1995) independently found through different research in the combat arena (military vs. police). Grossman and Siddle (1995) combined their research and labeled the memory loss phenomena as "Critical Incident Amnesia" (1998), reporting that the greater the stress the greater potential will be for memory problems to occur. Today, the mechanism of critical incident amnesia is well understood and is a component of the release of the stress hormone cortisol. Cortisol is released throughout the body during SNS excitement. One function of cortisol is to suppress inflammation and cellular immune activation during stressful events. In the brain, cortisol helps in binding receptor sites inside the hippocampus to help form memories. During high levels of SNS excitement, however, cortisol is released at higher levels. A release of too much cortisol can lead to individual neuron binding, resulting in a burning of the nerve cell. This results in the hippocampus' inability to organize the components of a survival stress event into a whole memory unit (Ratey, 2001). Thus, memory will be fragmented, especially within the first 72 hours.

There are several implications that emerge regarding stress and memory. Officers need to be trained regarding the development of their expectation of responding to an incident and perceptions formed under stress, and how

SNS activation impacts perceptual distortions, mental processing, and survival response. The stress of the event, magnified by tunnel vision and auditory exclusion, may color the officer's perception, and it will not be uncommon for an officer to miss some factors relevant to the incident. It is also likely that when multiple officers respond to an encounter, varying accounts of the incident and officer's level of participation will be reported, and failing to be aware of a fellow officer's actions, will be impeded. It should be common for officers reports to differ after participating in the same event.

Beyond this, officers, administrators, and investigators need to understand that after a critical stressful incident it is not uncommon to experience some memory distortion. Realizing this, and following legal parameters and departmental policy, when conducting a use of force investigation, administrators should require a written report and an interview with the officer within a reasonable time period after the incident, knowing that the first report will not be totally accurate. Interviews should be taped and later transcribed. The findings reported here, illustrate that officers should be allowed to complete, at a minimum, one full sleep cycle that can aid in assisting further recall regarding incident events. Administrators should permit a officer to submit a supplemental report and conduct a second interview, realizing that additional comments may be offered by the officer. Consideration of allowing an officer to return to the scene, accompanied by a supervisor or investigator, or re-construction of the event, may assist in aiding memory recall. The findings suggest that officers who were exposed to visual and auditory triggers were helpful in restoring memory of the situation. Officers should be afforded this process in order for them to completely express their actions in the event.

The time to respond to the threat and being able to physically respond are inter-related and emerge as the second and third major themes. Slightly over half of the lethal force officers and one-third of the physical altercation officers reported they saw the threat. A majority of both groups responded there was no warning or just a few seconds with which to perceive and respond to the threat.

The implications of processing spontaneous sensory stimuli, in a survival situation, which effects perception, reaction time, and ultimately physical response, can be framed within the context of salient attention to the task at hand. The results showed that officers will experience perceptual, physiological, and psychological distortions when confronted with a spontaneous life threatening event. Once the SNS is activated, the body is placed on alert to

focus on the threat. In a number of situations vision is the primary sensory element that receives the stimuli and locks on to the threat, which sends a chain of physiological and psychological events into action. After the officer's perception has placed meaning to the threat, a reactionary strategy must be formulated, and depending upon the severity and immediacy of the threat, immediate physical action may be needed and acuity to the threat will result. Perception places value to the event and adrenaline is released through the body preparing it to respond and survive. As a result, distortions are likely to emerge which help the officer attend to the threat. This implies that what is salient at the moment will be receive attention. In survival stress response situations, where response time is minimal, physical response will directly attend to the matter at hand until the threat is resolved. It is understandable that sounds will be diminished, heart rate would increase, field of vision narrowed, memory becomes distorted, and physiological response may develop.

Perception and response time obviously will impact an officer's ability to respond appropriately. With only a few seconds to respond to the threat, a majority of lethal force officers reported they were able to focus on the threat, assess the nature and seriousness of threat, 56 percent stated they responded automatically, 75 percent did not lose eye/hand coordination, and 75 percent responded based on their training. Of those officers recalling the estimated distance of the threat, 52 percent revealed the threat was within ten feet or less.

It is an understatement to make the observation that training is paramount to officer survival, but the findings of this study underscore the fact. Lethal force incident officers reported that 56 percent received simunitions training and 80 percent completed point shooting training. All of the respondents of this study are "survivors" and their training is making a difference in their ability to perform in stressful encounters.

The results of this study reveal that training is the key to effective survival response. Ratey (2001) advocates that contextual conditioning maximizes learning and that if it is to be effective (changing behavior) the activity must be challenging and realistic, followed by constructive feedback. The results of this study show that training must go "above and beyond" mere annual firearms qualification. Static firearms training is useful for acquiring firearm competencies, but in order to respond to spontaneous, realistic life threatening attacks, simunitions and realistic scenario-based training is recommended.

Burroughs (1998) found that when police officers were

exposed to dynamic stressors in spontaneous firearm training exercises, officers' reactionary time was enhanced significantly, and by exposing them to situations which activated the SNS, the training assisted officers in recognizing how to respond under SNS activation. Point or instinctive shooting by pointing the weapon at the threat as well as squaring up to the threat was used by a majority of these officers.

Stress inoculation and dynamic scenario based training is highly useful in exposing officers to recognize a level of threat, exposing them to the effects of perceptual narrowing problems at combat distance, and enhancing force decision-making. Siddle (1995) and Smith (2002) advocate that instructors need to lay a solid foundation in initial training in accordance with the stimulus response training principles (i.e., static, fluid, and dynamic). Once static and fluid training phases are completed, instructors should maximize student training by assisting them in recognizing threat cues, through stimulus response training, by placing them in the "context" of realistic situations (dynamic phase). This type of training enhances the ability to "build expertise" in field performance and maximizes proper decision-making. Survival response training should be structured around dynamic encounters where the instructor has previously trained the officer to recognize a threat level with response options consistent with the threat cue (Siddle, 1995; Burroughs, 1998; Ross, 2002). Exposing officers to threat cues in spontaneous lethal force encounters, where the officer can experience the effects of SNS activation are important in managing survival stress. Integrating stimulus response training and building dynamic scenario-based training around the four stages of reaction time (perception, analyze, formulate a strategy, and motor response) is recommended. Such a training design will assist officers in perceiving a threat level with minimal reactionary time, requiring them to apply reactionary responses taught earlier, which aids in creating officer confidence in their tactics.

It is recommended that instructors develop dynamic simulation training which is designed to expose one or multiple officers to respond to lethal force situations that include varying types of arrests, disturbance calls, traffic stops, and responding to the mentally impaired. These types of circumstances made up over 90 percent of the event circumstances where force was employed and over 60 percent involved more than one officer. Training with multiple officers should be conducted on a regular basis in order to reinforce performance. Training should include point shooting, reactionary drills, shoot-don't-shoot scenarios, and video taped for evaluation and coaching the officer's performance. Constructive feedback by the

instructor is important to reinforce training principles, revealing cues missed, to enhance the motivation for learning, and using the options in the field. All dynamic training should use safety equipment and role players should be trained prior to the exercise.

Moreover, training endeavors should also be directed at physical force alterations. Like lethal force officers, physical altercation officers had no warning or only a few seconds with which to respond to the threat. Unlike the lethal force officers, however, these officers were less likely to execute a complex motor skill, somewhat more likely to lose eye/hand coordination, less likely to react automatically and based on their training, and a number of the officers indicated they experienced difficulty in forming a response to the threat.

Study results should direct trainers in structuring dynamic training. Because of the critical nature of using lethal force in an arrest situation, firearms qualification and training in the past have received more attention than physical force training. Less-than-lethal force tactics and equipment, however, are used more frequently by officers and dynamic training structured as previously mentioned should be performed on a regular basis. Training scenarios which include one and multiple officer response which require the officer to use varying physical control tactics and authorized force equipment should be designed. Facilitating a takedown technique and applying handcuffs in a stressful situation is more difficult than practicing the skill in a static mode in the gym. An ideal training design, with careful planning, and safety equipment, would include scenarios where escalation and de-escalation strategies have to be demonstrated in accordance with varying threat levels. The training design would also include writing a report after the incident followed by feedback from the instructor by viewing the scenario video tape and report.

The importance of providing an understanding how survival stress affects an officer's perception and physical response is accentuated from the results of this study. Study results also underscore the need for ongoing training in survival motor skills. Survival skills instructors are encouraged to use this information in enhancing their training and their students' comprehension regarding the effects of survival stress on their performance in the field. Based on the study findings, survival motor skills instructors should approach their responsibility of teaching with the idea of influencing their students' capability of forming workable perceptions about their environment and to properly respond cognitively and physically. The goal of training is to increase an officer's ability to effectively make sound justifiable decisions, increase officer skill confidence,

enhance officer safety, in order to respond with survival skills supported by legal and ethical foundations. This may be accomplished if instructors focus on teaching threat cues and automatic response options to the threat. This will increase officer confidence in force options which assist in placing the officer in a “winning” mental state when confronting a survival stress situation.

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### *Case Cited*

- Graham v. Connor, 490 U.S. 386 (1989) An Analysis of the Effects of Survival Stress in Police Use of Force Situations Darrell L. Ross, Ph.D. and Bruce K. Siddle

### *Abstract*

While the research on the stressors in police work are abundant, research which examines the effects of survival stress on human performance in use of force situations is lacking. Using a survey design to measure six dimensions of stress of police officers engaged in either lethal or less-than-lethal force situations, 560 police officers responded to a 54 item questionnaire. The questionnaire was designed to solicit responses regarding the respondents perception of stress during a use of force confrontation, focusing on the psychological, physiological, physical, and post-incident manifestations of stress. This analysis compares the results of these two groups, reports the significant findings, and presents recommendations for administrators, trainers, investigators, and officers.

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