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The Effects Of The Sympathetic Nervous System On Officers  
Involved In Critical Incidents And The Application Of  
This Information To Post Incident Investigations

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## **ABSTRACT**

When a police officer is involved in a situation that is a serious threat to his/her physical well being or life, the sympathetic nervous system (SNS) is excited and begins initializing processes for the defense of life. This phenomena has been referred to as the "fight, flight, or freeze syndrome". When an officer experiences these survival stress responses, they may suffer from perceptual narrowing, loss of cognitive reasoning, and partial or total amnesia.

Officers involved in critical incidents sometimes exhibit behavior that appears to be irrational or illogical. These behavioral responses are often attributed to loss of temper or poor judgement when in fact these are sometimes instinctual self preservation actions brought on by the activation of the SNS.

It is imperative that use of force incidents be thoroughly investigated and that all information relevant to the incident be brought to light. To obtain this objective those persons who are charged with conducting these investigations should be well trained. This training should include knowledge on the effects of survival stress, the sympathetic nervous system responses, and how to reduce the anxiety levels of those officers who have been involved in critical incidents.

## **INTRODUCTION**

The purpose of this research document is to identify the physiological changes that take place to an officer that is involved in a critical incident, the cause and effect of activation of the sympathetic nervous system and why it is important for those individuals involved in post incident investigations to have knowledge of this information. It is often perceived by those who are conducting follow up investigations that an officer who relates their recall of an incident in a light differently than what may otherwise appear is lying or trying to "cover up". The fact of the matter is that because of the level of stress involved in the situation the officer suffered from some degree of perceptual narrowing and is relating facts as they believe to be true.

It has long been recognized that officers involved in critical incidents will experience some type of physiological change. These changes are dependant in part on the type of situation, the officer's level of training and experience, and mental preparation. These changes can range from a rapid pulse rate, sweating, and tremors, to visual and auditory distortions, time distortion (Solomon 40) and in some cases, partial or total amnesia (Grossman & Siddle 3; Pierson 32). An officer that has had to fire his weapon in defense of his own life may perceive

that the situation lasted for five minutes when in fact it lasted for only one. The officer may believe that they only fired two rounds and it is discovered later that they fired seven. Through current research these factors can be explained by detailing the powerful, involuntary effects of the sympathetic nervous system.

This document will explore text books, police training manuals and validating research as well as training research conducted outside the realm of law enforcement. Included herein will be information elicited from experts in the field of post incident investigations and police psychologists. Also included will be excerpts from professional publications and journals.

There are a myriad of people involved in post incident investigations and reviews. There will be a criminal investigation, and/or a grand jury review, and an administrative review done by internal affairs. These investigations will involve investigative officers, police administrators, lawyers, and expert witnesses. It is important that all of these parties have an understanding of the effects the sympathetic nervous system has on officers involved in critical incidents so a fair and impartial assessment of the situation can be conducted. Policies should be developed to ensure investigators have been trained in this area and that post incident investigations take this information into account (Grossman & Siddle 6).

### **Historical, Legal or Theoretical Context**

The after effects brought on to the human animal by the activation of the sympathetic nervous system during times of

survival stress are certainly not a new discovery. During the Civil War soldiers suffering from combat were diagnosed as having " irritable heart ", in World War One the term " shell shocked" was used, In World War II it was called " combat fatigue". After the Vietnam War the term we are most familiar with " post traumatic stress disorder" (PTSD) was developed (McCafferty, et al 22). PTSD is the term we most commonly associate with the stress encountered by police officers in response to becoming involved in critical incidents (Clede 124).

Officers experiencing PTSD may experience sensory distortions, flashbacks, nightmares, and a heightened sense of danger among other symptoms (Geller & Scott 289). In the late 1960s, following riots in several major cities, psychologists began working with police agencies (Scrivner 12). Many police departments now have psychological services or peer counseling teams available to their officers.

A critical incident is defined as " an event that is experienced on or off the job that is outside the realm of normal human experience and could be expected to produce significant emotional reactions in anyone" (Bohl 170). The characteristics of a critical incident are that they are usually sudden and unexpected, they jeopardize your sense of control, disrupt your beliefs, values and basic assumptions of how the world works, and may include an element of physical and/or emotional loss (Remsberg, Anderson 62 ; Wells 70). Though critical incidents may come in many forms, the focus of this document will be those incidents officers are involved in that will require some type of

post incident investigation specifically, shootings or use of force situations.

Officers involved in situations of critical incident stress may experience perceptual narrowing, the term coined to exemplify this effect was "tunnel vision ". Perceptual narrowing encompasses more than vision, it is not uncommon for officers involved in shootings to have not heard the gun shots fired by themselves or the suspects, the officers recall of the time involved in the situation may be distorted, the officer may not recall parts or all of what happened. It is not unusual for officers involved in such incidents to not realize they discharged their firearms or recall the number of rounds they fired(Reiter 14.1 1). Additionally, officers may have acted in an irrational or illogical manner. There is still debate over the "Newhall incident" in which a CHP officer under fire put his spent brass in his pocket instead of dumping it on the ground (Geller & Scott 322).

With all of this information available, there are some police agencies that are remiss in how post incident investigations are conducted. It is recognized that two separate investigations are to be conducted, one is a criminal investigation and the second an administrative investigation to determine if the officer acted in accordance with departmental policies (Stone 42). In some cases those conducting the investigations may not have a defined purpose in their responsibilities, some may not have any past experiences that allow them to relate to what the officer is experiencing. Also,

unfortunately, there are those who refuse to acknowledge that their personnel are vulnerable human beings susceptible to emotional reactions (Pierson 32). To quote one deputy who has been involved in these type of circumstances, " Realize that taking a human life, unless you've done it yourself, is a matter beyond your comprehension. You don't know what it feels like and you don't know the fears its reality produces in some of us" (Needham 1).

### **Review of Literature or Practice**

The sympathetic nervous system (SNS) is a part of the autonomic or involuntary nervous system. When excited by circumstances of survival stress, it is the SNS that activates the freeze, flight, or fight syndrome (Whitesell 9). The SNS will cause the pupils of the eyes to dilate, increase both the rate and force of the heartbeat, cause an increase in blood pressure, and constrict the blood vessels of the abdominal viscera and the skin of the limbs (Reide ; Anderson 3). The SNS is an instinctual self protection device that gears the body to receive more information through the perceptual senses and gears the body up to flee or fight. An overload from the SNS can cause one to loose cognitive reasoning and freeze or act irrationally (Whitesell 9, Siddle (a) 76).

To help understand the stages an officer must go through to respond to a threat, PPCT Mngt. Systems developed the" reaction time model" for use of force instructors (Siddle (b) 3-35). Siddle outlines four stages of reaction time as: 1) perceive;

2) analyze/evaluate; 3) formulation of strategies; and  
4) initiation of motor action (Appendix A). During the first stage, the perceptual senses gather information to help the officer identify the threat. If the SNS has been excited and has caused perceptual narrowing, the officer will experience difficulty in analyzing the information being received. If the perceptual input decreases, cognitive processing will automatically be affected (Siddle (a) 79).

During times of extreme stress, the pupils will dilate, the contour of the eye lens will change and officers will experience a loss of near vision and peripheral vision. The brain will demand more information causing the head to pull square to the target and opening both eyes for binocular vision (Breedlove & Siddle 30). This can result in a situation where only vision is processed and cues from the other senses (such as gun shots) may be diminished or filtered out (Grossman & Siddle 3). An individual may have vivid recall of a type of weapon or a suspects face but not recall seeing third parties or environmental surroundings (Reide). This response also accounts for not remembering firing a weapon or misidentification of a item as a weapon.

An officer's recall or memory of an incident is based on their perceptions at the time of the incident. Police officers can only report what they perceived, not what actually happened (Artwohl 3). A lack of recall about what actually occurred is not a sign of deception (Price). After a traumatic event the brain goes through a process of downloading information. Recall is

often improved after a period of rest and many times the officer's recall is extremely better and more closely matches the crime scene events (Price). Based on extensive combat experience, the U.S. Army has an understanding that the first report is never right (Grossman & Siddle 4).

It is the custom and practice of many police departments to have those officers involved in critical incidents to provide statements of what occurred as soon as possible after the incident. Surprisingly, this thought is echoed by those in the field of science even though scientific research would indicate to do otherwise (Stone 43). Excitement of the SNS will cause an officer to suffer a loss of fine motor control and in some cases, cognitive reasoning. Any report is probably going to be jumbled and poorly written (Artwohl 2). Some agencies find it advantageous to wait in taking statements since it is common that officers might remember additional details of an incident in the days that follow (Artwohl 4).

Due to the psychological impact a critical incident can have on an officer it has been recommended that the officer be removed from the scene (Remsberg & Anderson 71). This practice has been adopted by many agencies however in some cases there are those who have found that this may not always be to the most benefit to the officer or the agency. A report from the Journal of Forensic Sciences calls for those officers that have been involved in shootings to go on a walk through of the scene with investigators (Stone 44). Though this may appear to be callous, it may actually prove to be beneficial to the involved officer. A walk through

can allow an officer to fill in the missing mental links of memory. Seeing the environment where the situation occurred sometimes allows an officer's mind to re-frame the incident (Riede). Regaining missing memory spots will reduce an officer's anxiety level and this in turn will benefit all those involved.

### **Discussion of Relevant Issues**

When a police officer is involved in a critical incident involving the use of force it often turns into a crisis event for the law enforcement agency employing that officer (McCarthy 33). It is imperative that all of those that are involved in investigating the incident are well prepared to deal with the situation. An officer involved shooting for example is not just another homicide investigation and it is a mistake to handle it as one (McCarthy 36). Police administrators have a duty to the public they serve to insure that a complete and thorough investigation is done. Administrators also have a duty to ensure that the officers that are involved in the incident are treated in a fair manner taking into account the stress of the incident in which they were involved and that to follow. The stress of the administrative/legal aftermath can compound the stress of the original situation (Solomon 42).

It is important to understand the mental processes or lack thereof that an officer has experienced during a critical incident when conducting an investigation. The responses of the sympathetic nervous system are controlled by the brain stem and not the cerebral cortex which controls the human cognitive

processes. During a fear response the brain stem shuts down the thinking cortex at the same time that it prepares the body for action (Whitesell 9). A fear response can elicit a state of being termed hypervigilance that can result in defective decision making. The evolvement of hypervigilance explains bizarre actions taken by officers such as freezing in place, attempting irrational acts, or repeating a same skill even though it is ineffective (Siddle (a) 90,91).

During incidents of survival stress an officer may respond in a manner contrary to what would have been expected, due to a SNS response. In the past police officers have mis-identified object as weapons during periods of high stress, leading to flawed judgement and sometimes tragic consequences (Siddle (a) 78). When suddenly confronted by an armed subject an officer may instinctively shoot at the subject in defense of his own life without thinking about seeking cover. Due to perceptual narrowing, that same officer may not be aware of the presence of innocent third parties in close proxemics to where the rounds are being fired. Instead of firing at an armed subject an officer may engage in hand to hand combat. In a state of hypervigilance an officer may freeze and not fire at all which can result in that officers death or the death of another officer or citizen.

After the conclusion of a critical incident, an officer will still be experiencing the effects of the SNS. Investigators need to realize this and handle the investigation in a manner to reduce the officers anxiety level. If an officer feels threatened by the way an investigation is being conducted their stress level

will automatically rise again, this in turn can further suppress their memory of the event (Reide). When first contacting officers, investigators should tell them what the procedures are and not make assumptions about the officers prior knowledge about those procedures (Artwohl 1).

There seems to be a growing trend in dragging out a post incident investigation longer and longer, this not only builds suspicion of a cover up with the public but builds unwarranted anxiety on the officer involved (Needham 2). The author interviewed an officer involved in a shooting (To remain nameless for purposes of privacy) who went through such an experience. This officer was already suffering PTSD from almost being killed by an armed suspect and suffered further from the elongation of the administrative investigation that covered a period of months. The constant stress caused this officer to experience a severe physiological response that landed him in the hospital where he almost died. This malady was not resolved until the investigation was completed and further treatment was afforded the officer. This also cost the city several thousands of dollars in workmans compensation benefits. Most officers want the investigation to be conducted completely and quickly (Reide).

Training for those who are designated to conduct post incident investigations can be accomplished informally through reading research and text materials or formally by attending seminars and classes. This information has been utilized by use of force trainers for many years and these instructors can be tapped to teach this subject. Although an agency may incur

initial cost to conduct training, failure to train can cost an agency a great deal more. Failure to properly handle an investigation can result in the loss of thousands or millions of dollars in resulting legal proceedings.

An agency's officers is its greatest resource. It is estimated that 50-80 percent of officers involved in shootings have left police work (Geller & Scott 289). The cost of hiring and training a replacement officer can run from \$60,000 to \$100,000 depending on the size of the agency. Everything, especially the proper conduction of a post incident investigation, should be done to keep those officers.

### **Conclusion/Recommendations**

The purpose of this document is to identify the effects that the sympathetic nervous system has on officers involved in critical incidents, the symptoms an officer may experience, and how this information should be applied to post incident investigations. Based on the research conducted the author makes the following recommendations:

- When an investigator first contacts an officer that has been involved in a critical incident, the investigator should strive to reduce the officer's anxiety level. Policies and procedures should be explained as to what will transpire immediately and in the days to follow.
- Officers should be allowed to do a walk through of the scene, this may allow an opportunity for an officer to fill in any missing links in their memory of the event.
- Since it has been shown that an officer's memory of a traumatic event can improve, usually within a few days, the formal post incident interview and requirement for an involved officer to provide a written statement of the event should be postponed until the officer has been afforded an adequate period of rest. It will be of

no benefit to anyone involved to insist on doing the interview right away if the officer is still too shaken or incognitive of what occurred to provide an accurate statement.

- No assumption should be made that the officer is lying or being evasive when their account of what happened differs from what may be evidenced at the scene or by other witnesses. An officer that has been involved in a critical incident can only remember what they perceived to have happened and this can strongly be affected by a response from the sympathetic nervous system.
- A post incident investigation should be conducted in a timely manner. Dragging out an investigation often leads to public suspicion of a "cover up" and can have long term adverse effects on the physical and mental well being of the involved officer.
- Departments should have written policies and established practices as to how a post incident investigation will be conducted and by whom. Investigators should receive training not only on the parameters of conducting a proper criminal or administrative investigation but be trained on the effects that the sympathetic nervous system has on persons involved in critical incidents as well.

Conducting an investigation involving an officer that has been involved in a critical incident can be one of the hardest jobs an investigator faces. The involved officer deserves the most accurate and thorough investigation that can be done as well as the compassion one would show any fellow officer that has been involved in a traumatic event.

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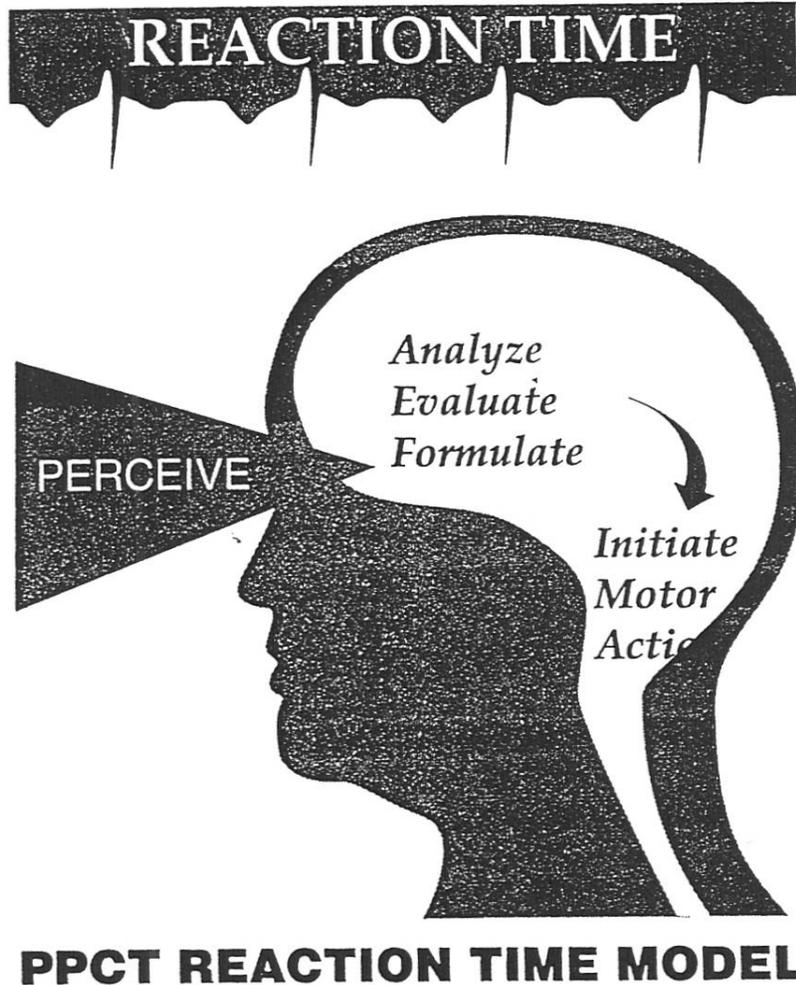
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## **Appendix A**

### **PPCT Reaction Time Model**

Appendix A



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