

POLICE RESPONSES TO OFFICER-INVOLVED SHOOTINGS*

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ABSTRACT

Research on the use of deadly force by police officers includes a limited body of literature that examines the consequences of involvement in shootings for officers who pull the trigger. This literature addresses two distinct issues related to the effects of shootings: 1) what officers experience *during* shootings and 2) what they experience *after* shooting incidents. Where the first issue is concerned, the research indicates that officers sometimes experience sensory distortions such as tunnel vision, auditory blunting, and altered perceptions of time. Where post-shooting responses are concerned, the literature reports that officers may experience a variety of short and long-term reactions that can include recurrent thoughts about the incident a sense of numbness, trouble sleeping, sadness, crying and nausea. Indeed, the existence of such responses has led mental health professionals who work with officers involved in shootings to identify them as a type of post-traumatic stress response, commonly referred to as “post-shooting trauma.”

The research described in this report was undertaken to enhance understanding of both aspects of officers’ reactions to involvement in shootings. It consisted of interviews with 80 municipal and county police officers who reported on 113 separate cases in which they shot citizens during their careers in law enforcement. The report offers a review of what previous research has reported about officers’ responses, describes the research procedures utilized in the current work, provides sketches of the officers who participated in the current study and of the incidents in which they shot other human beings, details what the research disclosed about officers’ experiences during and after their shootings, and concludes with a discussion of the academic and policy ramifications of these findings.

POLICE RESPONSES TO OFFICER-INVOLVED SHOOTINGS

Research on the use of deadly force by police officers includes a limited body of literature that examines the consequences of involvement in shootings for officers who pull the trigger. This literature typically conjoins what are actually two distinct issues related to the effects of shootings: 1) what officers experience *during* shootings and 2) what they experiences *after* incidents in which they shoot. Where the first issue is concerned, the limited research indicates that many officers experience sensory distortions such as tunnel vision (perceiving but a small portion of what is present in the visual field), auditory blunting (the attenuation or exclusion of audible sounds), and altered perceptions of time wherein some segment(s) of the shooting are experienced in either slow or fast motion (see, e.g., Nielsen, 1981; Solomon and Horn, 1986; Campbell, 1992). Where post-shooting responses are concerned, the literature reports that officers may experience a variety of short and long-term reactions. In the immediate aftermath of shootings, officers may experience a variety of mental and/or emotional symptoms such as a sense of numbness, anxiety, and anger, as well as physical symptoms such as crying and nausea. As time passes, officers may lose their appetite, have trouble sleeping, experience recurrent thoughts or “flashbacks” of the shooting incident, feel guilty about injuring or killing another human, and/or experience a host of other longer-term responses to the shooting event (see, e.g., Nielsen, 1981; Solomon and Horn, 1986; Campbell, 1992). Indeed, the existence of such responses has led mental health professionals who work with officers involved in shootings to identify them as a type of post-traumatic stress response, commonly referred to as “post-shooting trauma” (e.g., Hill, 1984; Nielsen, 1981; Stratton et al., 1984).

The research described in this report was undertaken to enhance understanding of both aspects of officers’ reactions to involvement in shootings. It consisted of interviews with 80 municipal and county police officers who reported on 113 separate incidents in which they shot citizens during their careers in law enforcement. The balance of this report is devoted to delineating what the data collected during these interviews tell us about how shootings affect police officers. It starts with a detailed review of what previous research has reported about

officers' responses, describes the research procedures utilized in the current work, provides sketches of the officers who participated in the current study and of the incidents in which they shot other human beings, details what the research disclosed about officers' experiences during and after their shootings, and concludes with a discussion of the research and policy ramifications of these findings.

THE LITERATURE ON RESPONSES TO SHOOTINGS

Much of the literature on what officers experience during and after shootings consists of expository essays based on non-systematic research (e.g., Bettinger, 1983; Burris, 1985; Shaw, 1981). The few systematic studies that have been published provide a more detailed picture of how police shootings affect involved officers. Nielsen's (1981) study of 63 municipal, county, and state law enforcement officers who had shot suspects, for example, found that more than three-fourths of them experienced some notable perceptual distortion during the event (e.g., tunnel vision, auditory blunting). Nielsen further reported that during the first week following the shooting more than 90% of the study officers experienced at least one *physical* symptom, such as nausea, headaches, and general fatigue, and that nearly 90% of the shooters experienced at least one *emotional or psychological* symptom, such as depression, anxiety, or intrusive thoughts about the incident. Finally, while Nielsen did not quiz officers about physical, emotional, and psychological responses during any time frame but the first week post-shooting, he did ask them whether they experienced any attitude changes during the first three months following their shootings. Nearly 80% of the officers Nielsen studied reported that they had; increased apathy and cautiousness were the most frequently reported changes.

Stratton et al.'s (1984) examination of how involvement in shootings affected 60 Los Angeles deputy sheriffs offered far less information than did Nielsen's earlier work. They reported no data on reactions during shootings and provided only limited information on post-shooting responses. Among the highlights of their findings is that the average deputy "occasionally" experienced recurring thoughts (flashbacks) about the shooting and had "some" problems sleeping during the week immediately after the incident. They further reported a

modest decrease in the frequency of flashbacks and sleep disturbances that deputies experienced as time passed during the first three months after their shootings (Stratton et al. did not mention whether they measured deputies' reactions after three months). They also reported that 63% of the deputies surveyed either cried or experienced feelings of depression, anger, and/or elation¹ at some (unspecified) point following the shooting. Finally, they reported that 30% of the deputies indicated that the shooting affected them either "greatly" or "a lot," that 34% of them reported a "moderate" effect, and the remaining 36% reported that the shooting affected them either "a little" or "not at all."

A more detailed picture of how shootings can affect involved officers comes from Solomon and Horn's (1986) questionnaire study of 86 Rocky Mountain-area officers who had shot suspects in the course of their duties. They reported, for example, that during the events in which they fired their weapons, 83% of the officers experienced some sort of time distortion, 67% experienced some sort of auditory distortion, and 56% experienced some sort of visual distortion. Where post-shooting experiences are concerned, Solomon and Horn offered information about 18 specific emotional, psychological, and physical reactions that officers may have experienced. They reported, for example, that 58% of the officers felt a notable degree of anger in the wake of the shooting, 46% experienced substantial sleep difficulties, and 44% had bothersome intrusive thoughts. They used information about the 18 symptoms to create a "trauma rating" score for each study officer and asked officers to rate how well they had integrated the shooting into their life at the time the questionnaire was administered. Solomon and Horn then examined the relationships between these two measures of how the shootings affected the officers and the degree of support the officers felt from various quarters (e.g., fellow officers) following the shooting. They reported that the more support officers felt, the less severe their response. Finally, Solomon and Horn reported that the information they used to develop the trauma rating scores indicated that 37% of the officers surveyed experienced "mild"

¹ They used a single indicator that asked the officers' whether they experienced any of these four things to develop this information.

post-shooting reactions, 35% experienced “moderate” reactions, and the remaining 28% had “severe” reactions. Unfortunately, the data they collected did not clearly delineate the time frame(s) during which officers experienced the various reactions they reported, so it is not possible from Solomon and Horn’s study to determine how officers’ reactions may have varied over time.

Two other studies that were published after Solomon and Horn examined officers’ responses to shootings offered data on just one of the two major temporal components involved (i.e., reactions during shootings and post-shooting responses). The first, Gersons’s (1989) brief study of 37 Dutch officers who had been involved in shootings, reported only on post-shooting experiences. Among the more salient findings reported were that 76% of the officers experienced recurrent thoughts about the event, 68% reported a sense of “hyper-alertness,” and 43% of them had sleep disturbances. Gersons did not offer data on the timing of officers’ post-shooting reactions, so it is not possible to derive information on how they might have changed over time.

While Gersons’s study was limited to officers’ post-shooting reactions, Artwohl and Christensen (1997) limited their work to data on responses during shootings, with a focus on perceptual distortions. The most notable thing about Artwohl and Christensen’s work is that the rates they report for many specific distortions are substantially higher than those reported in other research. While they report, for example, that 82% of the 72 U.S. officers they studied experienced tunnel vision, the highest rate previously reported is 44% (see Campbell, 1992, below). Similarly, where they report a heightened visual detail rate of 65%, the only other study to report on this distortion (Solomon and Horn, 1986) reported a rate of 18%, and while the previous high for rate of auditory blunting was 51% (Solomon and Horn), Artwohl and Christensen report that 88% of the officers in their research experienced a diminution of sound.

The most comprehensive systematic research to date on how involvement in shootings affects law enforcement officers is Campbell’s (1992) study of special agents of the Federal Bureau of Investigation (FBI), which indicated that FBI agents who are involved in shootings tend

to have less severe reactions compared with their peers in state and local law enforcement. Campbell administered a 16-page questionnaire, which he augmented with structured face-to-face interviews, to 167 agents who had been involved in shootings in the years 1973-1989. He presented his findings in three main categories: 1) physical and emotional responses at the time of the shooting, 2) psychological responses following the shooting, and 3) physical and emotional responses after the shooting. Among the most frequent emotional and physical experiences reported during shooting events were a sense of disbelief that the event was occurring (37%), a sense of increased physical strength (46%), tunnel vision (44%), and auditory blunting (42%).

The instrument that Campbell used included items for agents to report on the emotional, psychological, and physical after effects they experienced during the first 24 hours, and then during the rest of the first week following their shootings. The instrument also asked agents to report any changes that they may have experienced in their attitudes or emotional states during the first six months after the shootings. For whatever reason, Campbell limited his presentation of the data on agents' post-shooting reactions to what they reported experiencing during the first week following the events. Highlights from this data include the information that at some point(s) during the first week, 62% of the agents experienced recurrent thoughts about the shooting, 29% had dreams about the shooting, 32% had problems sleeping, 24% were fatigued, and 25% had some sense of anxiety and/or tension.

Although Campbell presented no data on temporal variability in agents' responses, he did devote considerable attention to the role that post-shooting events played in agents' adjustment. He wrote, for example, that many agents felt that certain post-shooting events had a negative impact on them: 27% stated that they worried a great deal about the Bureau's investigation of their shooting, and 20% identified the news media as a major source of aggravation. On the flip side of the coin, 60% of the agents believed that discussing their experiences with other agents who had been involved in shootings helped them to cope with their own shooting. Moreover, Campbell reported that agents who went through a systematic post-shooting mental health

debriefing (the Bureau's "Post-Critical Incident Program") typically experienced fewer negative consequences in the wake of their shootings than their peers who did not.

While the extant literature offers a substantial amount of information about what officers experience during and after shootings, we still have a very limited picture of how shootings affect police officers. We know, for example, that perceptual distortions are a common occurrence during shootings, but we have virtually no information on the inter relationships between different types of distortions, how perceptions might change during shooting events, or how distortions might be associated with other phenomena. Similarly, while we know that some officers experience specific physical, emotional, and psychological reactions to involvement in a shooting, previous research has not clearly specified how officers' responses vary over time and we have little understanding of how post-shooting reactions might be associated with other factors. The research described below was undertaken to provide more information about issues such as these.

RESEARCH PROCEDURES

Data were gathered via face-to-face interviews with a sample of municipal and county police officers and sheriff's deputies who had shot citizens (see below for the sampling procedures employed). The interviews included two parts. The first consisted of the administration of a substantially modified and expanded version of the interview schedule that John Campbell (1992) used in his study of FBI agents. The instrument used in the current study included versions of nearly all of the items Campbell used in his instrument, with modifications to either a) render the schedule relevant to local and county officers (e.g., items that referred to "the bureau" were altered) or b) to increase clarity. The current instrument also included numerous items not found in Campbell's, which were added to obtain more comprehensive measurement of specific topics (e.g., the weapon[s] possessed by subjects, a more complete inventory of what officers experienced during shooting incidents, and temporal variability in officers' reactions following shootings). In total, the instrument (a copy of which is in the

Appendix) included 144 major sets of items that covered the following broad areas of interest:

- X Background information about the officer, such as demographic characteristics, law enforcement experience, and assignment at time of shooting.
- X Features of the shooting event, such as the number of suspects involved, their weapons, the actions they took, the actions that the subject officer and any other officers present took, and the nature of injuries incurred by officers, suspects, and other citizens.
- X The thoughts, feelings, and perceptions that subject officers experienced during the shooting incident.
- X Their physical, psychological, and emotional experiences after the shooting.
- X The treatment that the subject officers received from others (e.g., family members, fellow officers, their agency) following the shooting.

After completing a separate questionnaire for each incident in which they shot citizens (see details below), each officer met with the Principal Investigator (PI) for an individual audiotaped, directed interview that was later transcribed. The interviews, which lasted between forty-five minutes and three hours (depending on how many shootings the officers had been in, how many of the various sorts of possible responses they experienced, and how expressive they were with their answers), focused on five major areas that were addressed in the following order: 1) officers' backgrounds and their experiences, thoughts, and feelings regarding deadly force prior to their law enforcement careers, 2) the training they received regarding the use of deadly force during the academy and the field training portion of their careers, 3) situations in which they did not fire even though they believed the use of deadly force would have been legally justified, 4) what occurred during the hours that immediately preceded the shootings, the circumstances of the shootings, and what transpired during the shootings, and 5) what occurred in the aftermath of the shootings.

The five-phase structure was designed to enhance the accuracy and detail of the data collected during the directed interview. The first two stages allowed the subject officers to ease into the topic of deadly force, and allowed the PI to build a rapport with them while discussing

their background and socialization into police work. The third stage served as a transition during which the focus of the interview shifted from more general and abstract issues regarding policing and deadly force to the more specific issue of particular confrontations with citizens. Starting the fourth phase with questions about what occurred in the hours preceding the shootings focused officers' minds on these critical events in an indirect fashion that was intended to get the officers thinking in a sequential fashion, and thereby to facilitate recall about what transpired during situations in which they shot citizens. Finally, the fifth phase of the interview moved sequentially through the four time frames addressed in the instrument (i.e., what transpired during the first 24 hours, the first week, the first three months, and after three months) in order to allow officers to continue with the sequential presentation of their narratives.

Officers' responses to questionnaire items guided the last two phases of the directed interviews (i.e., the shootings and their aftermath). This served two purposes. First, by giving officers a chance to describe in their own words their thoughts, feelings, and experiences, the directed interviews yielded details about attitudes, emotions, experiences, and events that could not be obtained from a questionnaire, thus creating a more detailed picture of officers' involvement with and reactions to the use deadly force. Second, because the directed interviews covered much of the ground addressed in the questionnaire, they provided a reliability check on officers' responses to questionnaire items. This was accomplished by informally recounting back to the officers what they had reported on the instrument (e.g., "So prior to firing your weapon you started to experience things in slow motion, but no other sorts of distortions"). This process occasionally identified mistakes that officers had made when they marked the questionnaire (e.g., failing to report something they experienced, or reporting in one time frame something that actually occurred in a different one) and sometimes yielded additional information about some facet of officers' experiences that they had not marked (e.g., "Now that I think about it, my sense of visual detail was increased because I could clearly see the hairs on the suspect's arm standing up"). When an interview yielded additional information about some issue, or disclosed that the officer had responded incorrectly to an instrument item, the PI told the

officer that he wished to alter the instrument to reflect the correct response to the relevant item and then, after obtaining the officer's permission to make the correction, did so in his or her presence.

With a discussion of the data collection methodology in place, attention now turns to a discussion of how the officers who were interviewed came to be included in the present study.

Selecting the Sample

As the literature review indicates, police shootings can be extremely stressful events. Even when involvement in a shooting does not produce notable disruption in officers' lives, moreover, officers are often quite wary about discussing their experiences during and after situations in which they shot people with individuals outside their circle of close acquaintances. This is particularly so when a stranger seeks them out with a request to discuss their experiences in great detail. Because many police officers who have been in shootings would be disinclined to discuss the incidents and their aftermath in a frank manner with researchers who are complete strangers (even when the researcher brings the pledge of legally guaranteed confidentiality; see below), the research employed a sampling strategy intended to reduce the social distance between the PI and the research subjects.

The first step in the sampling process actually occurred before the proposal for the present research was submitted to the National Institute of Justice (NIJ). Prior to submitting the proposal, the PI secured agreements to participate in the study (contingent on NIJ funding and the confidentiality provisions that would obtain under 42 United States Code 3789g) from several acquaintances who had been involved in shootings during their careers in law enforcement. The second step occurred after funding was secured. In this step, the PI informed other acquaintances in the police community about the project and asked them for help identifying officers (including sheriff's deputies) who might be willing to be interviewed. After this, the PI asked the pool of subject officers developed via the first two steps to help identify others who might be willing to participate in the study.

This "snowball" methodology resulted in interviews with 81 officers from 19 municipal

and county law enforcement agencies in four states. One officer's interview was excluded from the sample because none of the rounds he fired in the sole shooting in which he was involved struck anyone. Two other officers interviewed were involved in a major shoot-out during which they and several other officers exchanged numerous shots with two citizens who were barricaded inside a house that eventually burned to the ground. The post-shooting investigation disclosed that both citizens had suffered gunshot wounds before their bodies were burned beyond recognition. While the damage done by the fire precluded a conclusive determination about the source of the bullet wounds, the officers' positions and actions during the shoot-out suggest that each of them did strike at least one of the citizens with gunfire. Consequently, these officers' interviews were retained in the sample. Each of the 78 other officers who participated in the study were involved in at least one shooting in which bullets they fired definitely struck at least one citizen.

There are two reasons why strategic informant sampling was employed in this research. The first was to reduce bias in the form of non-response that would almost certainly have obtained had a traditional probability sampling strategy been employed. The second was to enhance the internal validity of research conclusions. Probability sampling techniques are generally preferred over other sampling strategies because they are designed to produce research findings with a high degree of generalizability. But they are not the best for all research settings, and there is reason to suspect that probability sampling would have actually produced findings with less validity than those produced by the research described in this report.

Any sort of probability sampling (e.g., a random selection of all officers who had shot in a randomly selected sample of police agencies) would have required that I work with the knowledge and blessings of police administrators. Because the research would have been linked with the agency, officers with negative feelings toward their agency (a fairly common occurrence in the police world even absent involvement in shootings) or who did not trust their agency (another common sentiment among police officers) would be negatively disposed toward participation. Similarly, because I would have been an unknown entity among the rank and file

officers of the agencies that would have been selected, probability sampling would bias the sample towards officers who are trusting of outsiders (an uncommon police virtue). Indeed, several of the officers I interviewed told me the only reason that they agreed to participate in the study was that they either knew me personally or knew the informant who vouched for my integrity and qualifications. (I did not ask the officers why they agreed to participate. Several simply offered the above information.) Thus, while one cannot know the sorts of bias introduced in the present sample by the use of the strategic informant technique, it did – at a minimum – substantially reduce non-response bias and thereby enhance the external validity of the study.

Where internal validity is concerned, it is doubtful that those officers who eventually did participate in a study based on probability sampling would be forthcoming about questionable behavior in which they may have engaged, any negative assessments they might have about how they were treated in the wake of their shootings, and problems they might have experienced. As detailed later in the report, several of the officers I interviewed told me that they lied to the mental health professionals (MHP) to whom they were sent by their agency about how they were feeling in the wake of their shootings because they believed that what they told the MHPs might get back to their superiors. Given this, it is logical to suspect that some number of officers selected through a probability sampling design would be less than completely truthful with a department-approved researcher who wandered into their lives asking extremely intimate, and potentially incriminating, questions. As the snowball methodology produced a sample of officers who willingly participated in the research because they had either a personal or once-removed link with the researcher, it is almost certain that the sampling technique used in the present study increased the internal validity of the findings produced.

The 80 officers in the final sample were involved in 147 incidents during which they discharged their firearms. Forty-five of the officers were involved in one incident, 21 were involved in two, 5 were involved in three, 6 were involved in four, 3 were involved in five, and 1 was involved in six shootings. Counted among these 147 incidents were those in which the officers fired at citizens and missed, shot inanimate objects (such as motor vehicles), shot

animals, accidentally fired their weapons, and other sorts of cases in which no humans were struck by study officers' gunshots. Because the study was undertaken to examine officers' responses to shooting humans, the officers did not complete questionnaires regarding incidents in which their bullets struck no one. Also, two officers who had been involved in multiple shootings could not spare the time to report on all of them. One of them completed questionnaires for four of his six shootings, the other for three of his four.² Both were briefly queried about the other shootings during the directed interviews.

In the end, 56 of the study officers completed a single questionnaire, 16 completed two, 7 completed three, and 1 officer completed four. The interview process thus resulted in 113 completed questionnaires regarding 113 instances in which study officers shot citizens.³

FINDINGS

Presentation of what analysis of the 113 shooting incidents disclosed begins with background information about the officers and the circumstances of their shootings. In order to facilitate speedy comprehension of this material, it is presented in outline form.

Profile of Study Officers

The bulleted information that follows provides some sense of these subject officers and the shootings they reported on in this study.

X The sample includes 74 male officers and 6 female officers.

² The two officers selected the shootings for which they completed questionnaires with no direction from the PI.

³ Because the study was undertaken to examine individual officers' responses to events in which they shot people, each officer's experiences as they pertain to a given shooting are treated as separate cases. The vast majority of the cases in the sample (98) were completely independent of one another, but 15 of them resulted from incidents where other officers in the sample also shot the citizen. These non-independent cases involved a total of seven shootings; six in which two of the officers interviewed shot the suspect(s) and one in which three did.

- X Sixty-two of the officers were white, nine were Hispanic, four were Asian/Pacific Islander, three were black, and two described themselves as having some “other” racial/ethnic background (e.g., Native American).
- X The officers’ age at the time of the shootings ranged from 21 to 49, with a mean of 32.
- X The amount of time they had spent as police officers prior to the shootings ranged from less than a year to 27 years, with a mean of just under 8 years.
- X The vast majority of the research subjects (75) held the rank of “police officer” (or “deputy sheriff”) at the time of the shootings; four were sergeants; and one was involved in shootings both prior to and after being promoted to sergeant.

CIRCUMSTANCES OF SHOOTINGS

- X Nearly half (54) of the shootings occurred while the officers involved were working general patrol assignments. Because the sample included a disproportionate number of officers whose work includes assignment to their agency’s special weapons and tactics (SWAT) teams,⁴ a substantial minority of the shootings (37) occurred during tactical operations. Fourteen of the SWAT shootings involved barricaded subjects, 6 were hostage incidents, 14 occurred while officers served high-risk search and arrest warrants, and the remaining 3 took place during miscellaneous SWAT activities. The 22 other shootings occurred during an array of circumstances that include undercover work, crime suppression patrol, and off-duty situations.
- X Other officers were present in 103 of the shootings and fired shots in 51 of them.
- X Subject officers faced a single suspect in more than three-fourths (89) of the shootings, two suspects in 13 shootings, three suspects in 5 others, four suspects in 4 instances, and five and six suspects in 1 shooting each.

⁴ For the last few years the PI has been involved in research regarding and training of special weapons and tactics (SWAT) teams and officers. Consequently, many of his contacts in the law enforcement community have been or are involved in SWAT work. As a result, many of the officers initially sought to participate in this project have SWAT experience. Given the nature of social networks, many of the officers referred to the PI by the officers in the initial pool also have SWAT backgrounds. The potential ramifications of the over-sample of SWAT shootings is addressed later in this report.

- X In the 89 shootings in which officers faced a single opponent, the suspect was armed with some type of firearm in 56 cases, knives or other edged weapons (e.g., axes) in 21 cases, miscellaneous other weapons (such as baseball bats, toy guns, and vehicles) in 9 other cases, and no weapons (i.e., the suspect was unarmed) in 3 cases. Among the 56 suspects who were armed with guns, 30 had a single handgun, 11 possessed a single shotgun, 5 carried a single rifle, 8 others were stocked with multiple firearms, and 2 others carried both a firearm and some other type of weapon.
- X In one of the 24 cases with multiple suspects, none of the suspects carried any weapons. In twelve of the remaining 23 cases, only one suspect was armed, most often with a firearm of some sort (N=10). Among the 11 cases in which multiple suspects possessed weapons, at least two of the suspects carried firearms in 9 of them. The largest number of opponents any officer faced was six, five of whom were armed with guns. In this case, the other four suspects dropped their weapons and surrendered immediately after the officer shot the first gunman. The most extreme multiple-suspect case involved an officer who was by himself when he engaged in a gun battle with four bank robbers, three of whom were armed with assault rifles. The officer somehow managed to incapacitate one robber and drive the rest away while sustaining only minor injuries himself, even though the only gun he carried malfunctioned early in the firefight.
- X Across the 113 cases, 60 suspects died, 43 incurred wounds that required hospitalization, while 5 others received minor wounds.⁵ One of the suspects who received minor wounds definitely would have suffered far more serious wounds (perhaps fatal ones) if not for the body armor he was wearing, which prevented the subject officer's rounds from penetrating his torso. In another case, a suspect who suffered severe gunshot wounds to

⁵ The number of suspects shot sums to less than the number of cases because the sample includes seven shooting incidents where more than one of the involved officers was interviewed. See footnote 3 above for additional information.

his head and legs almost certainly would have died if his body armor had not stopped other rounds fired by the subject officer from entering his chest cavity.

- X Subject officers received injuries requiring hospitalization in six cases and minor injuries in eight others. Among the officers whose wounds required hospital treatment were five struck by gunfire and one who suffered a severe laceration when his assailant slashed him with a butcher's knife. The most serious injuries suffered by a subject officer were caused by a through-and-through gunshot that traversed the officer's torso from front to back. The extensive internal damage caused by the bullet included such massive bleeding that the officer's heart stopped beating on three separate occasions before medical personnel could stabilize her.
- X Other officers were injured in 13 cases, 1 of them fatally.
- X Citizens suffered non-fatal injuries at the hands of suspects in eight cases and fatal injuries in two others.

With this information about the officers and the circumstances of their shootings in hand, attention now turns to officers' responses to involvement in shootings. The task begins with a discussion that identifies the specific information the current study sought about what officers experience during shootings.

Responses During Shootings

The current study includes information about two distinct sorts of experiences officers may have had during shooting events: 1) thoughts and feelings and 2) perceptual distortions. Previous studies treated shootings as unitary events, simply measuring and reporting whether officers experienced specific phenomena during the situation in which they fired. Research on human responses during other sorts of traumatic events, however, indicates that individuals' experiences can vary over the course of a given stressful episode (e.g., Girelli et al., 1986). Consequently, the instrument used in the current study queried officers about thoughts/ feelings and perceptual distortions during two distinct points in the shooting incidents: 1) prior to firing weapons and 2) the moments during which and immediately after they fired their guns. Where

thoughts/feelings are concerned, the instrument included items for officers to indicate whether they experienced

- X a sense of disbelief
- X fear for self
- X fear for others
- X a need to survive
- X a rush of strength or adrenalin
- X intrusive thoughts about irrelevant matters
- X any other specific thoughts or feelings.

Regarding perceptual distortions, the instrument used in the current research included items that queried officers about whether they experienced any of the following phenomena prior to firing and upon/after firing:

- X tunnel vision
- X heightened visual acuity
- X diminished sound
- X amplified sound
- X time passing more slowly than usual (i.e., slow motion)
- X time passing more quickly than usual (i.e., fast motion)
- X any other perceptual distortions.

The data set thus includes information about four distinct categories of officers' responses during shootings: 1) thoughts/feelings prior to discharging their weapons, 2) perceptual distortions prior to discharging their weapons, 3) thoughts/feelings upon and after discharging their weapons, 4) perceptual distortions upon and after discharging their weapons. For simplicity's sake, the second time frame will henceforth be referred to with terms such as "while" and "as" firing. The presentation of what the current research disclosed about officer' responses during shootings will first address thoughts/feelings at each of the two time points, then move on to perceptual distortions.

Thoughts/Feelings

In order to develop some sense of how the current data compare with what previous inquiries have reported about officers' mental and emotional experiences during shootings, the first analytical step taken was to find out how often officers experienced each of the several sorts of thoughts and feelings *at any time* during the 113 shootings studied. Overall, officers reported experiencing at least one of the thoughts/feelings listed in the instrument in 110 (97%) of the shootings. In the specific response categories, officers experienced fear for others in 60%, a rush of strength or adrenalin rush in 55%, disbelief in 42% of the cases, fear for self in 41%, need to survive in 30%, intrusive thoughts in 14%, and miscellaneous "other" emotions/thoughts in 33% of the shootings. Table 1 compares these figures (where possible) with what previous research has reported.⁶ The table shows that officers in the current study more frequently experienced each of the specific responses that Campbell (1992) measured in his FBI subjects. It also shows that the officers in the current study less frequently experienced fear for self and more frequently experienced fear for others than did the officers that Neilsen (1980) surveyed, and that they less frequently had intrusive thoughts than did the officers in Artwhol and Christensen's (1997) research. With this information in hand, attention now turns to the more fine-grained look at what officers think and feel during shootings, which is provided by the current study's measurement of these responses during two distinct segments of time (i.e., prior to and while pulling the trigger).

TABLE 1 BELONGS ABOUT HERE

⁶ In this, and all other tables that compare data from the current research with that reported in previous studies how shootings affect police officers, studies that did not provide any information about the specific subject in question are simply excluded from the table. In Table 1, for example, Solomon and Horn (1986), Stratton et al. (1984), and Gersons (1989) are all absent because none provided any data on officers' thoughts/feelings during shootings.

Prior to pulling the trigger, officers experienced at least one of the six specific thoughts/feelings delineated on the instrument in 102 (90%) of the cases, while in six others the involved officers reported experiencing only some “other” specific thought or feeling. Thus, subject officers recalled having at least one specific thought or feeling prior to shooting in 96% of the cases studied. Regarding the prevalence of each thought/feeling prior to firing, officers reported experiencing fear for the safety of others in 54%, a rush of strength or adrenalin in 44%, fear for their own safety in 35%, a sense of disbelief that the incident was happening in slightly less than one-third (32%) of the shootings, a need to survive in just over a quarter (27%), intrusive thoughts about irrelevant matters in 10%,⁷ and some “other” thought or feeling in 29% of the cases. Counted among these “other” thoughts/feelings were concerns about the tactical situation that the officers faced (e.g., being in a cross-fire with other officers); apprehension about the placement of shots officers were about to fire; a sense of calm; anger at the suspect for trying to harm them or some innocent third party; attention to the weapon the suspect carried; and, in one case, a reaction that the officer could only describe as thinking “Oh, Shit!!” just before being run down by a suspect driving a truck.

As was the case prior to firing their weapons, officers reported at least one specific thought or feeling as or immediately after they fired in 96% of the cases. They experienced fear for others in 49%, a sense of strength or adrenalin rush in 46%, disbelief in 34% of the cases, fear for self in 30%, a need to survive in 23%, intrusive thoughts in 9%, and some other specific thought or feeling in 30% of the cases. Officers experiencing such “other” responses reported, among other things, being angry at the suspect, wondering if the shots they were firing were justified, concern that the suspect did not go down immediately upon being struck with the initial bullets fired, and a sense of confusion over what was happening because they did not realize that they had just fired (see discussion on pages 37 and 38 below for more on this point). The figures regarding officers’ thoughts and feelings a both time periods are presented in Table 2 below.

⁷ These thoughts tended to focus on officers’ loved ones. This is also the case where intrusive thoughts upon firing goes.

TABLE 2 BELONGS ABOUT HERE

The Role of Fear

One thing that stands out in the foregoing discussion is that it appears that many officers experienced no sense of fear either prior to or as they shot, which at first might strike one as odd inasmuch as the standard for the justifiable use of deadly force in law enforcement is that officers perceive that their life or limb, or the life or limb of a third party, is in imminent peril. A more detailed look at the data indicates that the frequencies reported above do not tell the entire story, however. First, moving from the gross rates of the four aspects of fear reported (i.e., fear for self prior to firing, fear for others prior to firing, etc.) into case-specific frequencies indicates that 70% of the time (N=79) officers felt fear either for themselves, others, or both, prior to firing, as they fired, or at both time periods. Thus, in a substantial majority of the cases did study officers experience a sense of fear for someone's safety at some point during the shootings in which they were involved. Second, information developed during the directed interviews indicates that the officers who did not report feeling fearful often recalled that they believed that their safety, the safety of a third party, or both, was in jeopardy at some point in their shootings.

Many of the officers who had not indicated on the questionnaire that they felt fearful indicated during the directed portion of the interviews that they perceived that the actions of the suspect(s) they shot had placed their safety, the safety of another, or both in imminent peril, but that they had not experienced the *emotion* of fear. Thus, the negative responses to the "fear" items on the questionnaire were indicative not of the fact that some officers did not believe that anyone's life was in danger, but rather simply that the intellectual understanding that they or someone else was in extreme danger did not translate into emotional trepidation.⁸

⁸ The case of an officer who shot a suspect immediately after being slashed with a large knife (opening a wound that required more than five dozen stitches to close) is illustrative of how officers who shoot can have an intellectual appreciation of danger, but experience no fear. He reported that he was thinking:

"I don't want to get cut again. I could start feeling [my] clothes get wet. I knew I was bleeding and... I don't want to get cut again. The only way I can solve this real fast is to shoot this guy and take him down."

The directed interviews also provided additional insights into the nature of the fear that officers experienced. Perhaps the most interesting impression in this connection is that what officers experience in terms of fear is not always commensurate with the actual degree of immediate threat posed to self and others by suspects. Two officers who shot unarmed suspects, for example, were quite fearful that they were about to be shot themselves because they believed that the suspects in fact possessed guns. At the other extreme, an officer who was seriously injured by a gunman who shot her as she was drawing her weapon did not experience any fear for her safety either before or after she began to return fire.

Other cases illustrate a different twist on the objective threat theme: the object of officers' fear is not always the person in the most immediate danger. In one such case, an officer who shot two armed suspects at the end of a vehicle pursuit that terminated in the empty front yard of private home reported that while he felt no fear for himself, he was quite fearful (both before and upon firing) for the residents of the house, even though none of them were present when the shooting occurred. The officer explained that he was worried that if he did not shoot the gunmen (one of whom was running toward the house when he turned and pointed his weapon toward the pursuing officer) that they would invade the house and take the family hostage. In another case involving fear for others, the officer involved in the wild shootout with four bank robbers mentioned on page 16 reported that his feelings of fear shifted during the incident. Prior to firing his first shot, he was fearful for both himself and other people in the bank, believing that everyone present was in grave danger of being killed. Once he started shooting, however, the

He went on to report that:

“never at any point along the way was [there] any feeling like fear as a cold feeling in the pit of your stomach, ‘Oh my God, I’m going to die’ or ‘I’m really hurt.’ That never at any point from start to finish [crossed my mind]. Oh, there have been times [on this job] when I’ve been scared shitless, ready to piss my pants. Absolutely. But this, it just never, never happened here. Fear means an actual physical reaction that you feel where you are in fear where you feel absolutely life threatened. This was really honestly more detached than that.”

The officer also reported that he was surprised at how calm he felt during and after the shooting, describing his mind-set as one of being in a “problem-solving” mode, relating that he “was really surprised” that he had no fear of dying, reporting and that he was “shocked” at that because he “thought that there would be [fear]” under those circumstances.

fear he felt for himself evaporated as the sense that he had to protect the bank customers and employees took over. Thus, even though the officer was in a furious gun battle in which all of the shots fired by the robbers were directed at him, the only fear he felt was for others.

Perceptual Distortions

As was the case with thoughts/feelings, the first analytical step taken in the analysis of altered perceptions was to find out how often officers experienced perceptual distortions at any time during the 113 shootings studied. Overall, officers reported experiencing at least one distortion (including “other”) in 107 (95%) of the cases. The single distortion most commonly experienced was diminished sound, which occurred in 82% of the cases. On the flip side of the auditory coin, officers perceived some noises as being exceptionally loud in 20% of the cases. Officers reported getting tunnel vision in 51% of the cases and having a heightened sense of visual detail in 56%. As for time distortions, officers experienced slow motion in 56% of the shootings and fast motion in 23%. Finally, officers reported experiencing some “other” distortion 13% of the time. Table 3 sets these figures in relief with distortion statistics from previous research to make for easy comparisons (where possible) with what other studies have reported about perceptual alterations during shootings.

TABLE 3 GOES ABOUT HERE

Among the more interesting components of Table 3 is the graphic representation of the substantial variability in distortion rates across previous studies, which was mentioned in the literature review above. Most notable in this regard is that the officers in Artwohl and Christensen’s (1997) study were 3.6 times as likely to experience heightened visual detail than were the officers Solomon and Horn (1986) surveyed. Where the current data are concerned, frequencies for four of the six specific distortions measured – tunnel vision, visual detail, diminished sound, and slow motion – fall within the range reported in previous studies, while the

figures for the remaining two – intensified sound and fast motion – exceeded slightly the high previously reported. With this comparative information in hand,⁹ attention now turns to a topic not considered in the previous research that addresses perceptual distortions during officer-involved shootings; the temporal dimension.

Officers in the current study experienced at least one of the several types of distortions prior to firing their weapon in 88% of the shootings examined. The most frequently reported distortions were visual in nature, with officers experiencing one or both of the visual anomalies listed on the instrument in more than three-quarters (78%) of the cases. They reported having a heightened sense of visual acuity about some aspect of what they saw (e.g., the suspects weapon) in 37% of the cases, tunnel vision in 31% of the others, and both phenomena in an additional 10%. Officers' auditory perceptions were altered in more than half the cases, as they experienced a diminution of sound in 42% of the shootings and intensification in 10% (no officers reported experiencing both before firing). Time distortions occurred in 55% of the cases, with slow motion (43%) occurring far more often than fast motion (12%; again no one reported both phenomenon). Finally, officers reported experiencing some other sort of distortion prior to firing just 6% of the time.

Officers experienced perceptual distortions at an even higher overall rate as they fired, reporting at least one in 94% of the cases. The occurrence frequencies for visual and time distortions at the time of firing were only slightly different from those observed prior to doing so – 27% during vs. 31% prior for tunnel vision, 35% vs. 37% for heightened detail, 11% vs. 10% for both visual distortions; and 40% vs. 43% for slow motion, 17% vs. 12% for fast motion, and 2% vs. 0% for both time distortions. The rates for auditory distortions changed substantially across the two time frames, however, as the rate of auditory blunting increased from 42% to

⁹ Solomon and Horn (1986) calculated overall rates for visual, auditory, and time distortions. They reported that 56% of the officers participating in their research experienced either tunnel vision, heightened visual detail, or both at some point during their shootings; 63% experienced one or both of the sorts of auditory distortions; and 83% experienced one or both of the time distortions. The comparable figures in the current data are 82% for visual, 85% for auditory, and 66% for time distortions.

70%, the figure for increased loudness was halved from 10% to 5%, and the portion of cases in which officers experienced both auditory aberrations rose from 0% to 8%. Finally, the rate of “other” distortions increased slightly, from 6% to 9%. The statistics for distortions during both time periods are presented in Table 4.

TABLE 4 GOES ABOUT HERE

Temporal Variability in Distortion

While the numbers regarding visual, time, and “other” distortions reported above suggest that these perceptual anomalies are fairly stable during shootings, comparing what each officer experienced prior to pulling the trigger with their perceptions while they fired discloses far more dynamism than indicated by the raw distortion rates. The case-by-case comparison indicated that in some cases a given distortion (e.g., visual) began as officers fired, while in others the same distortion, which began prior to firing, ended when the officers fired their weapons. In other words, many of the perceptual changes between the two time periods canceled each other out in the aggregated data. Indeed, a closer look at the data indicates that the degree of change in auditory anomalies is even more marked than the raw data suggest: officers reported diminished sound prior to firing in 42% of the cases vs. 70% while firing.

The case-by-case comparisons indicate that time distortions were the most consistent across the two time frames measured, with concordance in 78 (69%) of the 113 cases. Officers experienced no distortion at either point in time in 38 cases, slow motion at both points in 32 cases, and fast motion at both in 8 others. For changes in time distortions, the following differences were observed: Among the 12 discordant cases in which officers experienced no distortions prior to shooting, 8 moved to slow motion and four 4 to fast motion as the officers fired. Among the 17 discordant cases in which officers experienced slow motion prior to shooting, time returned to normal in 9 of them, moved to fast motion in 7, and was experienced in both slow and fast motion in 1 other as the officers fired. Among the six discordant cases where officers experienced fast motion prior to firing, time moved to slow motion in five and

was experienced as both slow and fast in one other.

Visual distortions were slightly less stable than temporal anomalies, as officers' ocular experiences were consistent in 76 (67%) of the cases. Officers experienced normal vision throughout their shootings in 20 cases, tunnel vision both prior to and while firing in 22, heightened visual acuity at both time points in 28, and both tunnel vision and a heightened sense of detail at both points in time in 6 cases. The following changes in what officers experienced visually were observed: In three cases in which officers experienced no visual distortions prior to discharging their weapons, tunnel vision set in as they fired, while in two other cases officers who had no distortion prior to firing had a heightened sense of visual detail as they fired.¹⁰ Among the 13 discordant cases where officers experienced tunnel vision prior to firing, the tunnel effect gave way to normal vision in five cases and a heightened sense of detail in five others, while heightened visual acuity was added to the initial tunnel vision in three others. Among the 14 discordant cases that involved heightened visual detail prior to firing, the sense of detail disappeared in five cases, gave way to tunnel vision in six others, and was joined by the tunnel effect in three others. Finally, in the five discordant cases where officers had experienced both visual anomalies prior to firing, upon firing none moved exclusively to tunnel vision, the tunnel aspect disappeared – leaving only heightened detail – in four others, and normal vision returned in a single case.

With auditory anomalies, officers' perceptions remained stable only 53% of the time (i.e., in 60 cases). The most dramatic shift observed was from normal hearing prior to firing (which was the modal response; N=55) to diminished sound upon doing so, which happened in 34 cases. In four other cases, officers who reported normal hearing prior to firing experienced both reduced and increased auditory acuity as they fired. In other words, 69% of the time when officers experienced normal hearing prior to firing, they experienced auditory blunting upon

¹⁰ Among the more dramatic instances of heightened visual detail comes from a case where two SWAT officers serving an arrest warrant on a murder suspect simultaneously fired as the suspect pointed a handgun at them. Both officers reported that they saw some of their bullets strike the suspect, causing his shirt to pop-up off of his body with each successive hit.

firing.

Information from the directed interviews offers additional insight about the nature of the remarkable attenuation of auditory acuity that so many officers (70% overall) experienced as they shot. The vast majority of the officers who reported diminished sound upon firing (either by itself or in concert with increased sound) indicated that it was their own gunshot(s) that was muted. Many officers who experienced this phenomenon reported that their shots sounded like a “cap gun” or “pop gun”; others stated that the gunshots simply were not as loud as they “should” have been,¹¹ and a small number of officers reported that they did not hear their rounds going off at all. The most extreme case of auditory distortion that included diminished sound involved a SWAT officer who fired a single several-round burst from a submachine gun at a barricaded gunman. He reported that while he did not hear his gunshots, he did hear the “clack-clack” sound of the weapon cycling as the slide moved backwards and forward, ejecting spent casings and delivering fresh rounds to the breech.

The dramatic onset of auditory blunting in the form of diminished gunshots raises an interesting question about the nature of perceptual distortions during police shootings: Does auditory attenuation actually begin at the point when officers fire, or do they simply notice a phenomenon that had set in at an earlier point because they possess a marked auditory baseline of what shots should sound like (from all the shooting they do in training) against which to compare what they are experiencing? If the first possibility is correct, the current research has provided some interesting insight into how perceptual distortions arise during police shootings. If it is the latter, on the other hand, this would suggest that officers experience a greater degree of distortion than they consciously perceive and thus that the picture painted by the current data

¹¹ Officers who reported that their gunshots were muted typically indicated that they made this judgment measured against the numerous times they had heard the reports of shots they and other officers had fired on the police gun range and during other forms of training. Several of these officers expressed amazement that the shots they (and sometimes other officers) fired during confrontations with suspects were not very loud. Among the more compelling of these stories concerns a SWAT marksman who fired a single round from his sniper rifle at the same instant that his partner fired. Both officers were inside the same small room, yet the officer in question reported that the twin gunshots sounded quite soft. He reported that he knew that the sound should have been deafening and that he can not understand why it was not.

regarding the timing of distortions is not as clear as it might first appear.

Additional evidence from another aspect of the data on perceptual distortions supports the latter possibility. As previously noted, officers reported experiencing some distortion(s) not among the six sorts specified on the research instrument prior to firing in 6% and upon firing in 9% of the of the cases in the current study. Several of the officers reporting these “other” perceptual anomalies indicated that one of the “other” distortions they experienced was a distorted sense of distance, where the actual distances between themselves, suspects, other officers, citizen bystanders, and inanimate objects (e.g., vehicles) were either far greater or less than they had perceived at the time of the shooting. The intriguing aspect of such reports is that officers’ realizations that they had incorrectly perceived distances occurred during retrospective examination of their shootings during which they learned of the actual distances between people and objects when the shooting occurred. That is, only by viewing photographs of the shooting scene, reviewing investigators’ sketches of the scene (including measurements), participating in a post-shooting “walk-through”¹² with investigators, or doing something else after the shooting to develop an understanding of the actual distances involved in their shooting, can officers come to know the accuracy of their understanding of the distances. Because many of the officers in the study did not later do anything that would inform them of the actual distances involved in their shootings, it is possible that officers’ sense of distances is altered far more frequently than the current research suggests.

Levels of Distortion

With the caveat in mind that officers may not always be aware of the sensory distortions they experience, attention now turns from the matter of specific alterations to the issue of the overall degree of distortions officers experience during shootings. As was apparent in the above discussion of how frequently officers experienced visual, auditory, and time distortions, multiple

¹² During investigations of police shootings, some agencies re-create the incident by having the involved officer(s) return to the scene after it has been processed to explain in detail what happened. Such a re-creation is typically called a “walk-through” because the officer(s) go over the shooting step-by-step, walking the investigators through the incident.

sensory irregularities can occur in a single shooting. In order to tap this aspect of the perceptual distortion picture in a parsimonious fashion, three scales were crafted that combine into single measures the legion of possible combinations of sensory alterations that may occur over the course of shooting incidents. The *first* of these “distortion scales” measures the overall degree to which each officer experienced sensory alterations prior to firing in each of the 113 shootings. It simply sums the number of specific distortions that each officer reported experiencing before firing in each shooting (each reported distortion counts for a single point). Because officers could have reported experiencing each of the six specific distortions listed in the instrument, plus a theoretically infinite number of “other” alterations, the possible scores for the scale range from a low of 0 (for officers who reported no distortions prior to firing) to a high of 6 + N (for officers who reported all six listed distortions, plus some number of “others”). The *second* distortion scale measures what officers experienced as they fired, and mirrors the first exactly. The *third* scale measures the overall degree of distortions experienced at any time during each shooting by simply summing the scores of the other two scales for each case. This overall measure of total distortion thus ranges from 0 (for officers who experienced no distortions at any point) to 12 + N.

TABLE 5 GOES ABOUT HERE

As indicated in Table 5, the observed upper limits of the scale scores – five for prior, five for firing, and 10 for total – are quite modest in comparison to their infinite potential. This stems from the fact that the greatest number of “other” distortions reported by any officer at any point in time was two. The fact that none of the officers scored a six on either the prior or during scales indicates that none of them experienced all of the six measured permutations of visual, auditory, and time distortions at either point in time. A closer look at Table 5 also indicates, on the other hand, that most officers did experience multiple distortions at each time point. Where the time prior to firing is concerned, officers reported experiencing at least two distortions in 70% of the shootings, three or more in 37%, four or more in 6%, and five distortions in just 1% of the cases. These figures translate to a mean of 2.02 distortions prior to firing per shooting.

The degree to which officers experienced distortions was even greater during the time that they fired, as the average number of distortions rose to 2.45 for this time frame. Officers reported at least two distortions while they were firing in more than three-fourths (76%) of the cases, three or more in more than half (57%), four or five in more than a sixth (15%), and, finally, five distortions in four percent (4%) of the cases.

Where the overall picture is concerned, Table 5 indicates that officers experienced more than one distortion during the course of nine out of every ten shootings (89%). This is understandable inasmuch as the “overall” scale captures distortions that set in prior to the time that officers shoot, and then continue as they fire, in effect measuring a unitary phenomenon twice. What is interesting here, however, is that 82% of the time officers reported experiencing at least three distortions, which means that the vast majority of the observed multiple distortions in the overall scale are not due to the continuation of a single type of distortion across two time points. In sum, the information on officers’ perceptions indicates that in most shootings officers experience multiple perceptual anomalies during the course of the event.

TABLE 6 GOES ABOUT HERE

Associations Among Distortions

Our understanding of the relationship between perceptual anomalies that officers experience during shootings is enhanced by the information offered in Table 6, which presents zero-order correlations among the 12 specific distortions measured in the current study. The first point of interest is that the strongest positive correlations are between before and during measures of the same distortions, as might be expected. The four largest coefficients are, in descending order, the time one and time two measures of heightened visual detail ($r = .61$), tunnel vision ($r = .50$), slow motion ($r = .46$), and fast motion ($r = .44$). A second point of interest is that the relationships between these distortions at time one and time two are not particularly powerful, with just one zero-order correlation exceeding .50. A third point is that the

weak bivariate associations between both sorts of auditory distortions across the two time frames ($r = .14$ for increased sound and $.24$ for diminished sound) reflect the previously noted instability of sound anomalies during shootings, particularly the remarkable onset of diminished sound when officers begin to fire their weapons. These last two points together underscore the previous discussion about the instability of given distortions across time that is masked in the “raw occurrence” figures presented in Table 4.

The correlation matrix also shows that some different types of distortions are related to one another, albeit modestly. Among the more notable findings in this connection is that when officers experience fast motion *prior to firing*, they are more likely to experience auditory amplification, both prior to ($r = .24$) and while ($r = .25$) firing. Similarly, officers who experienced fast motion *as they fire* are somewhat more likely to perceive an intensification of sound, both prior to ($r = .30$) and while ($r = .28$) firing. On a slightly different tack, when officers experience auditory blunting prior to firing, they are more likely to experience slow motion, both prior to ($r = .28$) and while ($r = .24$) firing. Other notable distortion pairs were: tunnel vision and reduced sound while firing ($r = .29$), slow motion and auditory blunting prior to firing ($r = .28$), and fast motion prior to firing and intensified sound while firing ($r = .25$). On the flip side of the coin, some sorts of anomalies are less likely to occur in the presence of others. Tunnel vision prior to firing, for example, is somewhat less likely to occur in concert with increased visual acuity prior to firing ($r = -.38$). Likewise, increased and reduced aural acuity prior to firing ($r = -.28$), slow and fast motion prior to firing ($r = -.33$), slow and fast motion while firing ($r = -.31$), and tunnel vision and increased visual acuity while firing ($r = -.27$) are all a bit less likely to appear together.¹³

¹³ The use of Pearson's r to estimate associations between binary indicators produces statistics that attenuate the underlying relationships between variables. Additional analysis was undertaken in order to ensure that calculating zero-order correlations to measure the bivariate relationships between distortions did not produce a misleading picture of which pairs of distortions are significantly related. In this exercise, each of the three pairs of non-significantly related variables that were on the cusp of significance were cross-classified in order to estimate a Phi statistic, which produces significance tests that are not based on attenuated relationships. This exercise found no additional significant bivariate relationships among the distortions

Multiple dimensional scaling was employed to obtain additional insight into the relationships among the perceptual distortions officers experienced. The Alscal procedure employed, which allows one to assess the degree to which binary variables cluster together, identified two distinct dimensions within the distortions officers experienced and four distinct clusters of distortions on these two dimensions. Two of these clusters consisted of pairs of the same distortion at different times: visual detail and tunnel vision. These findings simply confirm what the bivariate analysis disclosed regarding the increased likelihood that officers will experience these distortions when they fire if they experienced them prior to pulling the trigger.

The other two clusters were a bit more intriguing. The first consisted of slow motion prior to firing, slow motion while firing, and diminished sound prior to firing. This suggests that there is a dimension of distortion that has to do with an attenuation of temporal and aural perception. The other cluster included the four distortions of fast motion both prior to and while firing and increased sound both prior to and while firing. This suggests that there is another dimension of distortion that consists of a tendency for increased temporal and aural perception. Together, these two clusters suggest that aural and temporal perception tend to operate in concert, both increasing and decreasing together. Given the weak bivariate correlations between time and sound distortions, however, it must be kept in mind that this tendency for co-occurrence is not a strong one.

TABLE 7 GOES ABOUT HERE

FIGURE 1 GOES ABOUT HERE

Sources of Distortions

Some of the literature on perceptual distortions asserts that sensory alterations are the result of a rapid discharge of stress hormones (e.g., adrenalin) that occurs when the sympathetic nervous system is activated by the brain's perception of an immediate life threat from the environment (e.g., Grossman and Siddle, 1999). This argument suggests that there should be links between the perceptual distortions that officers experience during shootings and both fear

for self and adrenalin rushes. In order to get some empirical purchase on this thesis, the relationships between all three of the perceptual distortion scales and the measures of fear for self and strength/adrenalin rush were examined. The first step in this process was to estimate the zero-order correlations between the following pairs of variables: fear for self *prior* to shooting and all three distortion scales, strength/adrenalin rush *prior* to shooting and all three scales, fear for self *while* shooting and the scale that measured distortions while firing, and strength/adrenalin rush *while* shooting and the scale that measured distortions while firing.¹⁴

This exercise disclosed only thin support for the notion that distortions during officer-involved shootings emanate from physiological responses to threat. With alpha set at .05 for the one-tailed tests suggested by the hypothesis, just five of the eight relationships examined were statistically significant, and all of these were quite weak. The largest correlation observed was between fear for self *prior* to shooting and *prior* distortions ($r = .22$). This was followed, in descending order, by *prior* fear and *total* distortion ($r = .20$), strength/adrenalin rush *while* firing and distortions *during* ($r = .19$), strength/adrenalin rush *prior* to firing and *prior* distortions ($r = .16$), and fear for self *during* and distortions *during* ($r = .16$).¹⁵

The next step taken in the assessing the relationships between fear, adrenalin rushes, and perceptual distortion was to examine whether experiencing both fear for self and a rush of strength/adrenalin in tandem was more strongly associated with distortions than were either of the phenomenon by themselves. This was accomplished by creating two additive scales that tapped the degree fear/adrenalin officers experienced prior to and while firing (for both scales 0 = neither fear nor adrenalin rush, 1 = either fear or adrenalin rush, and 2 = both fear and adrenalin rush), and regressing the appropriate measures of distortion on these scales. This

¹⁴Neither the *prior* nor the *total* distortion scales were regressed on the measures of what officers experienced while shooting because the temporal sequencing would not be proper. Fear and strength/adrenalin rushes experienced *while shooting* cannot affect officers perceptions before they fire; hence, the exclusion of the *while* shooting thoughts/feelings and *prior* distortions associations. Similarly, the relationships between fear and strength/adrenalin *while* firing and overall distortion were not estimated because the total distortion scale includes perceptions *prior to firing* in it.

¹⁵ T-tests identify the same five pairs of variables as being significantly associated.

exercise disclosed that the combined fear/adrenalin measures were more consistently correlated with distortion than were the separate measures, but that the associations were only marginally stronger than the significant associations observed in the first step of the analysis. All four of the associations examined – i.e., fear/adrenalin *prior* with all three scales, plus fear/adrenalin *while* firing with distortions while firing – were statistically significant, with fear/adrenalin *prior* and distortion *prior* having the largest correlation ($r = .28$), followed by fear/adrenalin *prior* and overall distortion firing ($r = .26$), fear/adrenalin *while* firing and distortion *while* firing ($r = .23$), and fear/adrenalin *prior* and distortion *while* firing ($r = .18$).

In sum, empirical consideration of the matter offers tepid support for the notion that the perceptual distortions that officers experience during shootings emanate from physiological responses to perceived threat. Looking at feeling of fear and strength/adrenalin rushes separately disclosed that three of eight associations were not significant and that the five significant associations were quite weak. When the two predictors were examined in tandem, the strength of the associations between officers' relevant thoughts/feelings and perceptual distortions were still quite modest.¹⁶

Recall of Shots Fired

The examination of officers' responses during shootings closes with consideration of a variation on the perceptual distortion theme. The literature includes the assertion – but no supporting data – that police officers often are not aware of how many rounds they fire during shootings (e.g., Artwhol and Christensen, 1997). The current data offers an opportunity to obtain some empirical purchase on this matter because it contains information on both the number of shots officers actually fired (as determined by the post-shooting investigation) and the number of rounds they had believed they had fired at the time of the shooting. The instrument included an

¹⁶It should be noted, however, that the binary nature of the fear and adrenaline measures suggests that bivariate relationships between distortions and fear and adrenaline may be stronger than what was observed in the present analysis. Because the dichotomies used truncate the variation in fear and adrenaline, it is possible that more sensitive indicators that more precisely measured these phenomena would have produced stronger associations. Readers should keep this in mind when making judgments about the degree of support that the analyses presented in this report lend to the fear/adrenaline-distortion hypothesis.

item that asked officers to report the total number of shots they fired during each shooting. The officers were also asked during the directed interviews how many rounds they had believed they fired, and this information was added to the data set.

Officers knew precisely the number of rounds they *actually* fired in 112 of the 113 shootings (in the other case, the officer could not remember whether he actually fired seven or eight rounds). The distribution of shots actually fired was highly skewed with a mode of one (N = 33), a mean of 4.5 (counting the single uncertain case as 7.5 rounds), and a high of 41. Officers fired fewer than 10 rounds in 105 (93%) of the cases. Among the remaining eight, officers fired 13 rounds in one case, 14 rounds in one case, 15 rounds in one case, 16 rounds in one case, 18 rounds in one case, 28 rounds in two cases, and, finally, 41 rounds in one case.¹⁷

The information the officers provided on the number of rounds they *believed* they had fired was not as precise. Officers reported that they believed they had fired a specific number of shots in 90 of the 113 cases. In 10 others, officers reported that they had believed that the number of rounds they had fired fell within a specific range (e.g., “I thought I fired 8 to 10 rounds.”). Among the remaining 13 cases were two in which the officers had no firm numbers in mind, but believed that they had fired *more* than the actual number they discharged; two in which the officers did not have any firm idea of how many rounds they discharged, but believed that they had fired *fewer* than the actual count; and nine in which the officers had *no idea whatsoever* about how many rounds they fired. The figures for number of rounds actually fired and the number believed to have been fired are displayed in Table 8, with the case where an officer believed that he had fired either seven or eight rounds counted as eight.

TABLE 8 GOES ABOUT HERE

A case-by-case comparison of the number of rounds thought to have been fired and

¹⁷ The three cases in which officers fired more than 20 rounds transpired during large-scale SWAT operations that involved protracted gun battles with barricaded gunmen.

actually fired in each of the 90 cases where officers recalled firing a specific number of shots was conducted in order to round out the assessment of the degree of agreement between actual counts and officers' recollections of how many shots they fired. This exercise disclosed that officers' recollections turned out to be incorrect in 14 cases. Overall, then, officers could not accurately recall the exact number of rounds they fired in 37 (33%) of the shootings (i.e., the 14 in which officers' recollections of specific numbers were incorrect, plus the 10 in which officers guesstimated a range, plus the 13 in which they had no firm numbers in mind).

A closer look inside the data provides some additional highlights about the nature of the discrepancies between officers' actions in pulling the trigger and their impressions of this behavior. Among the 14 cases where the officers' belief that they had fired some specific number of shots was mistaken, the figure they had in mind was lower than the actual count in 12 cases and higher in the other 2 cases. Among the ten cases where officers reported a specific range in which they believed the actual number of shots fired fell, the true figure was within the range in three cases and higher in the other seven. Adding the two figures for low-count cases (i.e., 12 and 7) to the two cases where the only notion officers' had about the number of rounds they fired was that they believed they had fired fewer than they actually did, yields a total of 21 cases in which the officer's recollection of the number of shots they fired was *lower* than the actual number. Adding the two high-count figures (i.e., two among the cases where officers' recalled specific numbers and two among the cases where officers recalled a range) yields a total of four cases in which the number officers believed they fired was *higher* than the true number. To summarize to this point, among the 37 cases in which officers' could not accurately recall the number of rounds they fired, officers under-counted in 21, over-counted in 4, had no idea how many rounds they fired in 9, and had in mind a range that included the actual number in 3.

Another point of information that emerges from a closer look at the data is that the accuracy of officers' recall tends to decrease as the number of shots they fire increases. None of the eight officers who fired 13 or more shots had an accurate understanding of the number; five had no idea how many rounds they fired (including the three who fired 28 or more) and the other

three thought they had fired fewer shots. Among the 17 shootings in which officers fired six to nine rounds, the officers had a specific recall that was accurate in just five cases. (They undercounted the number in seven, over counted in two, recalled a range within which the actual number fell in two, and had no clue in one). In the 88 cases where officers fired five or fewer rounds, the officers were correct in their belief about the number of rounds they fired in 71 cases. (Officers recalled a number that was lower than the actual count in 11 cases, recalled a higher number in 2, had no clue in 3, and recalled a range into which the actual number fired fell in the remaining case). Thus does the recall accuracy rate drop from 81% when officers fire five or fewer rounds, to 29% when they fire six to nine, to 0% when they fire 13 or more.

Perhaps the most interesting single data point from the figures on officers perceptions of the number of rounds fired is that in one case the involved officer was not aware that he had fired any rounds at all. In this case, the officer in question was shot at close range by a suspect who then immediately fled the location. The suspect was captured nearby after losing a gun battle with the injured officer's partner. It was discovered during the post-shooting investigation that the first officer had fired one round that struck the suspect during the initial confrontation in which he himself had been shot. The first officer had no recollection that he had fired his gun.¹⁸

Information gleaned from the directed interviews regarding the other 112 shootings disclosed a variation on the theme of not recalling firing one's weapon. In several of the cases in which officers' perceptions of the number of rounds they fired jibes with the number they actually shot, the officers stated that they were not aware of the fact that they were firing as they were pulling the trigger. In such cases, the officers developed their understanding of the number of rounds they fired at some point after they ceased firing shots, but before the incident had ended. In one such instance, the only reason the officer knew that he had fired four rounds is that he knew that he carried four rounds in his shotgun, which he emptied at the suspect before

¹⁸ Another interesting point from this incident concerns the officer who captured the gunman. He received a gunshot wound during the shootout that brought the suspect down, but was not aware that he had been shot until well after the incident was over.

drawing his sidearm (which he did not fire). He did not recall firing four rounds; he just deduced from his empty shotgun that he had done so. In another case, an officer knew that he had fired his semi-automatic handgun only because when he looked down the frame to obtain a sight picture on an armed suspect who was wrestling with his partner, he saw that the hammer was cocked back, which could only have happened if he had already fired, because the gun he was carrying fires the first round double-action and subsequent rounds single-action. At that point, and before the situation was resolved, the officer realized that he had fired a single round as he was bringing the gun up from his holster. It was only after the officer's partner rolled the suspect onto his back that the officer knew that his round had found its mark.

Because officers such as the two mentioned immediately above developed the correct understanding of the number of rounds they fired only because of some external cue, it is evident that the rate at which officers have independent cognition of the number of rounds they fire during shootings is somewhat lower than the two-thirds figure reported above. Because the perception figures in some cases are measuring officers' retrospective understandings of their actions (albeit very soon after the action in question), it must be understood that the hard data in Table 8 present a conservative picture of the scope of the deviation between officers' perceptions of and the reality of how many rounds they fired.

Summary of Findings Regarding Reactions During Shootings

The following points summarize what the present data disclose about officers' reactions during shootings: 1) Officers experienced a wide variety of specific thoughts and feelings during the encounters in which they shot others, 2) The thoughts and feelings that officers experienced often shifted during the course of their shootings, 3) A large majority of officers experienced some sense of fear for self, others, or both at some point during their shootings, 4) The vast majority of the time, officers experienced at least two types of perceptual distortions during shooting incidents, 5) When comparisons were possible, the experiences of the officers in the current study generally fell within the bounds of what previous research has reported on perceptual distortions, 6) Officers' perceptions can change substantially over the course of

shooting incidents, 7) Some specific distortions are more likely to occur in tandem with others, while some are less likely, 8) The degree of distortion that officers experienced was mildly related to feeling of fear and adrenalin rushes, and 9) There are substantial and systematic deviations between officers' understandings of the number of rounds they fired and the number of rounds they actually fired.

Responses After Shootings

The instrument included several items that queried officers about the thoughts, emotions, and physical responses they experienced during four distinct time periods following their shootings: (1) within the first 24 hours after the shooting, (2) from the second to the seventh day, (3) from the beginning of the second week after the shooting to the end of the third month, and (4) after three months had passed. For simplicity's sake, these time frames will henceforth be referred to as the first day, the first week, the first three months, and post-three months (and like verbiage), respectively. For each of these four time periods, officers were asked to report whether they experienced each of the following psychological or emotional phenomena:

- X elation
- X sadness
- X numbness
- X recurrent thoughts about the shooting
- X fear for their physical safety
- X fear of legal and/or administrative problems
- X anxiety
- X nightmares
- X other thoughts/feelings

and each of the following physical responses:

- X nausea
- X loss of appetite
- X headaches

- X fatigue
- X crying
- X trouble falling/staying asleep
- X other physical symptoms

Officers were also queried about whether they felt that each of a set of 54 statements – lifted almost verbatim from Campbell’s (1992) instrument – dealing with post-shooting opinions and experiences that could have occurred at any time after their shooting applied to them. Presentation of what the study disclosed about officers’ experiences in the wake of their shootings will focus on the information gleaned from the time-specific items and use the information from these 54 statements to flesh-out specific points. Before moving forward with this material, however, a brief discussion of the timing of the interviews vis-à-vis the shootings is in order.

Seven of the 113 shootings took place less than three months before the involved officers sat for their interviews: one occurred 12 days prior, one occurred 19 days prior, and the other five occurred between two months and three days and two months and 18 days prior. One other shooting occurred three and one-half months before the involved officer was interviewed. These eight cases present an obvious problem in a research project that sought to develop information about what officers experienced since the three-month mark following their shootings.¹⁹ It was resolved through the following procedures:

First, the officers involved in the two shooting that had occurred less than 20 days prior to the date of interview were instructed to ignore all items that dealt with post-shooting responses after the first week. Second, the officers involved in the other six shootings in question were instructed to ignore the items dealing with responses after three months had passed. Third, based on the assumption that officers who had not experienced a given phenomenon within the first

¹⁹ Two of the remaining 105 shootings occurred seven months prior to interview and the remaining 103 happened at least one year prior. The longest amount of time between shooting and interview was 25 years. Six of the shootings occurred in the 1970s, 25 in the ’80s, and the remaining 82 in the 1990s.

two-plus months following a shooting were not likely to experience an onset of that response within the next several days, the officers involved in the five shootings that occurred between two and three months prior to sitting for interviews were instructed to respond to the items that dealt with post-shooting responses between eight days and three months. Finally, the various items that these officers were instructed to ignore were entered as “not applicable” in the data set.

The research also included one case that presented a different sort of data collection problem. In this case, the subject officer suffered a life-threatening gunshot wound during the shooting in question (a firefight with an armed robber), flat-lined three times before medical personnel finally stabilized her, and was unconscious for most of the first 48 hours following the shooting. Consequently, the officer was instructed to ignore all items regarding responses during the initial 24-hour time frame. These items were then coded as “not applicable” in the data set for the case in question and entry of post-shooting responses began with the one-week time frame.

In the end, the above procedures yielded a data set with 112 cases that include information on officers’ responses within the first 24 hours following shootings,²⁰ 113 cases with information on responses during the first week, 111 cases with information regarding the first three months, and 105 that contain information about officers’ responses after three months had passed.

With this background information in hand, attention now turns to what analysis of the data disclosed about the subject officers’ post-shooting experiences, starting with their psychological and emotional responses.

²⁰ The officer who was told to ignore the items for the first 24 hours reported that she had suffered some loss of memory due to a decrease in the volume of oxygenated blood that reached her brain during the first several minutes after being shot. After regaining consciousness, she was told that she had been communicating through physical gestures (intubation precluded verbal communication) with others during the first two days post-shooting. She has no recollection of any such discussions, or of anything else during this 48-hour time frame.

Psychological/Emotional Responses

The first step taken to analyze officers' psychological and emotional responses was to determine the number of cases in which officers experienced each type *at any point* following their use of deadly force. For this exercise, all 113 shootings were examined.²¹ This process disclosed that recurrent thoughts were by far the single thought/emotion most often experienced. Officers reported this response at some point following 96 of the shootings. The directed interviews disclosed that few of the officers viewed having recurring thoughts as a negative experience (see discussion of sadness below). Indeed, most officers described the thoughts they had in either positive or neutral terms (see discussion of elation below), although many reported that they had second-guessed themselves, wondering if they had taken appropriate actions immediately prior to and during the moments they shot.²² One theme that several officers touched on in this connection was wondering if they could have done anything to avoid pulling the trigger, contemplating whether different actions might have led to some resolution short of deadly force. Another related theme for some officers was how well they performed in terms of firing their guns; some officers reported questioning the appropriateness of the number of rounds they fired, while others reported trying to figure out why the bullets they fired did not always strike precisely where they had aimed (e.g., why rounds aimed at the suspect's chest struck the suspect's arm).

Anxiety

Officers reported having a sense of anxiety at some point following 48 of the shootings. Some of the officers who had this response reported that they were anxious about the prospect of getting into additional shootings. One officer who was involved in a shoot-out fairly soon after graduating from the police academy, for example, figured that having a shooting early in his

²¹ See Table 9 for the same information on the 104 shootings for which full data is available.

²² Officers responded affirmatively to the statement, "I reviewed the incident again and again, wondering if I did the right thing" in 31% of the cases.

career meant that he might well be destined to be involved in others and was therefore anxious about the prospect of future shootings.²³ Other officers who experienced anxiety linked the feeling to concerns about the prospect of sharing what happened with others, press coverage, and/or investigations into the shooting. The officers from this second group typically fell into one of two categories: 1) those who had not been in a shooting before and therefore were anxious about the unknown, or 2) those who had been in prior shootings and were not looking forward to telling others about another the incident, going through another investigation, and so on.

Concerns About Legal and Administrative Repercussions

Concerns about the post-shooting investigation were also salient for officers who reported fear that the shooting might create administrative and/or legal problems for them. Officers reported such fears in 40 cases; worrying that they might be punished by their agency, sued in civil court, and/or charged with a crime for shooting the people they shot. For some officers, such fears emanated from the shooting itself. Among the officers whose fears were rooted in what transpired during the shooting were two who shot unarmed citizens whom the officers believed were about to shoot them. Understandably, both officers were quite worried about how their agency and the legal system would respond after it was determined that the suspects were in fact unarmed. For other officers, fears of legal and/or administrative entanglement came from things that occurred after the shooting. In one such case, an officer who was initially confident that he had acted properly became quite concerned about legal and administrative matters during the on-scene portion of the investigation into the incident. As he waited for the investigation to commence, his attorney (who came to the scene as part of the agency's standard post-shooting protocol) got into a heated argument with the homicide division supervisor who was in charge of the investigation. When the officer – who was some distance away and thus could not hear what was being said – saw the quarrel, he figured that there must be some big problem with the shooting; why else would the two go toe-to-toe at the scene of an

²³ The officer's intuition was correct. He was involved in a second shooting six months after the first.

officer-involved shooting? As it turned out, the row between the detective-lieutenant and the attorney was over some other matter entirely, and had nothing to do with the shooting in question. When the officer's attorney told him this, it calmed his fears, but made him quite angry with both his attorney and the lieutenant for airing their differences in a fashion that had caused him great consternation.

Elation

Officers experienced a sense of elation at some point following 33 of the shootings. The directed interviews identified three types of elation among the officers who reported experiencing it. The first sort that officers spoke of was a sense of joy about having survived a life-threatening situation. The officers who experienced this form of elation reported a profound satisfaction about being alive following an event that could have left them dead. The second type of elation reported is a form of exhilaration (most often in the first 24 hours) that appears to be a type of residual emotion from the sheer excitement of the situation where they fired. As one officer put it, he was "hyped-up" for a while after his shooting. The third type of elation officers described – which takes two distinct forms – is deep satisfaction about doing their job properly.

The first form of deep satisfaction was felt by officers who reported that they had wondered how they would perform if they were ever involved in what they described as the utmost challenge in a law enforcement career: an encounter where deadly force is necessary. These officers reported feeling elated that they had passed this ultimate test. The second form of job-related elation is social in nature; a deep satisfaction from proving to one's peers that one is competent to handle themselves in the most trying of law enforcement tasks. Most of the officers who reported this sort of elation reported that they had no doubts that they would perform well if confronted with a shooting situation, but nonetheless felt that they had to prove their mettle to their peers.²⁴ The rest of the officers who experienced this social form of elation

²⁴ Several male SWAT officers reported this sort of elation in terms of having proven their worth to their teammates. One female patrol officer reported that her sense of job-related elation stemmed from the sense that she had proven to her male colleagues that she could handle herself properly in life-threatening situations.

felt a doubled sense of accomplishment for having shown their competency to both themselves and their peers. In sum, none of the various sorts of elation that officers reported involved pleasure taken from hurting or killing the person they shot, but rather described feelings of excitement about the event, joy about being alive, or accomplishment about doing a tough job properly.

Sadness

Officers reported having a sense of sadness following 29 of the shootings. It was often over the fate of the person they shot, though not always in relation to their injury per se. Several of the citizens shot by officers were, in the minds of the officers, tragic figures whose lives came to tragic ends. Some of the citizens, for example, were suicidal and chose to end (or try to end) their lives in a hail of police gunfire,²⁵ while others were lost souls whose long-standing substance abuse had in some fashion led them to the deadly confrontation with authorities. The officers who expressed sadness after shooting such citizens often framed their emotions in terms of feeling bad that a fellow human could devolve to such a state that they ended up on the wrong end of police guns.²⁶ Other officers expressed sadness for the members of the family of the person they shot, feeling sorry for them to have lost a loved one. Still other officers reported that they felt bad that they had been involved in a situation that scared *their* loved ones, causing their parents, spouses, or other family members to worry about their safety (in some cases because they had been injured). Finally, some officers reported feeling sad for innocent people who were injured or killed by the citizen they shot in the moments before they took the citizen under fire.

Numbness

Officers reported a sense of numbness at some point after 23 of the shootings. They

²⁵ One officer who wounded an apparently suicidal individual reported a sense of sorrow for the citizen he shot because the citizen's family maltreated their obviously disturbed relative by, among other things, refusing to permit him to accept a plea bargain that would have provided the mental health treatment he so clearly needed. For background information on the phenomenon of suicidal individuals seeking death via police gunfire (commonly called "suicide-by-cop" in law enforcement circles), see, for example, Hutson et al., (1998).

²⁶ In 10 cases officers responded affirmatively to the statement "I felt sorry for the subject who was shot."

often described this numbness in terms of being so overwhelmed by the shooting and its aftermath that they were mentally, emotionally, and/or physically spent. When asked to describe the numbness he was feeling, one officer stated that he felt as if “he had used up all of his brain cells” dealing with all that had happened during the shooting, the events it had set in motion (e.g., the investigation), and the other post-shooting reactions he was experiencing.

Nightmares

Officers reported having nightmares after 20 of the shootings. In most cases these nightmares had themes that revolved around police shootings, while in some there was no apparent link to the event. Shooting-related nightmares took two forms. The first sort in some fashion replayed the shooting incident (sometimes with different circumstances, characters, and/or outcomes). In one case, for example, an officer had repeated dreams of the thief she shot charging at her. The second sort of shooting-related nightmare officers reported consisted of dreams where the officer was involved in a different deadly force encounter. In this type of nightmare, officers were typically unable to defeat their opponent, either because their gun would not properly function or because the bullets that did strike had no effect. Finally, in dreams with no clear linkage to the shooting, officers often had visions of monsters and similar entities.²⁷

Fear for Safety

Officers felt some fear for their safety following 20 of the shootings. For most of the officers, the fear took the form of a realization that they could have been injured or killed during the incident in which they fired. For other officers it was a fear of becoming involved in another incident, one that might not end as favorably for them as the shooting they survived. The fears that officers expressed typically had less to do with being afraid of injury and death and more to

²⁷ In 11 cases officers agreed with the statement that after the shooting, “I had bad dreams about things not related to the shooting.” In some of these cases the officers did not report having nightmares among the specific post-shooting reactions they experienced. When quizzed about this apparent discrepancy during the directed interviews, the officers in question indicated that they had similar dreams prior to the shooting and therefore did not attribute those they experienced afterwards to having been involved in a shooting.

do with worry about what their loved ones would do if something bad happened to them. Perhaps the most sobering example of such fear arose in an officer when the person he shot (who had been holding a child hostage) was released from custody and began to stalk and threaten the officer and his family. The officer became quite fearful that if he were incapacitated or killed that his family would be at the mercy of a dangerous lunatic.

Guilt

Officers experienced some sense of guilt for a variety of things in 14 of the cases. For example, one officer who shot an individual armed with a toy gun felt guilty over having hurt someone who posed no actual threat to him. In a related vein, some officers expressed guilt over having harmed or killed the person they shot, even though the individual had engaged in actual life-threatening action. In one case such a sense of guilt came when the involved officer's father passed away soon after the shooting. The officer reported that for a while he felt that his dad's death was a form of punishment for him having taken the life of the gunman he shot. Other officers experienced guilt for not having done their job as they perceived they should have during the shooting. One officer who reported this sort of guilt felt badly that he was not able to prevent the escape of any of the four bank robbers with whom he engaged in a wild shootout while working an off-duty job by himself.²⁸

Miscellaneous Psychological/Emotional Reactions

In addition to the several specific psychological/emotional responses that officers reported experiencing, they indicated that they had some "other" thought or feeling in 48 cases. The most commonly expressed of these miscellaneous reactions was anger, which officers reported in 15 cases. The object of the anger was often the person they shot. In some such cases officers were angry at their opponent for trying to kill them, while in others they were upset at their target for forcing them to shoot. One officer, for example, was angry with the suicidal

²⁸ The officer did strike one of the robbers with several of the rounds he fired. The suspect escaped only because the body armor he was wearing prevented incapacitating injuries, allowing him to scramble into the get-away car. This is the same case first mentioned on page 16.

citizen he shot for involving him in a demented death drama. Other officers were upset with fellow officers over actions they later took during shooting incidents. One such officer – who shot a rifle-toting gunman after dozens of other officers had failed to do so during a tense stand-off – expressed anger at the officers who did nothing because he felt that at least one of them should have shot the gunman long before the subject officer arrived on the scene. Still other officers were upset with the detectives and other law enforcement officials (e.g., district attorney personnel) over some aspect of the fashion which they investigated and reviewed the shooting. Finally, some officers expressed anger at the news media for what they viewed as biased coverage of the shooting that put them in a bad light. Some of the officers who received “bad press” about their shootings singled-out for special reprobation specific reporters who they felt had been especially biased, offering withering, biting negative comments about them during the directed interviews.

Half a dozen officers reported a sense of pride or satisfaction over the actions they took during the shooting. This response is, obviously, closely related to the satisfaction-based elation discussed above. Information collected during the directed interviews suggests that the difference between the two types of responses lies in the nature of satisfaction or pride felt. The officers who felt satisfaction or pride and who checked the “elation” response category seemed to have had a more visceral response compared with their peers who chose to check the “other” category to register their more cerebral sense of accomplishment. Whatever the case might be, the information from the “other” category indicates that more officers experience some measure of satisfaction from their actions than was indicated by officers’ responses to the “elation” item.

Counted among the “other” thoughts or feelings that officers reported were a few responses that could be viewed as the flip side of the job satisfaction coin. One officer, for example, reported a sense of disappointment that the shots she fired did not strike her opponent where she had aimed, while another said he was embarrassed about his inability to appropriately assess the actual threat posed by the person he shot: an emotionally disturbed individual armed with a toy gun. Other responses officers reported included the desire to withdraw from other

people, the desire to avoid confrontations, an increase in the frequency of benign dreams, second-guessing the decision to make police work a career, difficulty focusing on tasks such as reading, and wondering if there was something wrong with them because they did not feel bad about killing another human.²⁹

Finally, one “other” reaction that was reported in 3 cases deserves special attention: depression. In two of the cases the depression struck well after the one week mark, but before three months had passed, and lingered well into the post three month period. In the third case, the depression struck well after the three-month mark. During the directed interviews, the officers involved in all three shootings reported that their symptoms included a reduced enthusiasm for life. One officer reported that this component of the depression got so severe that he contemplated suicide. Shortly after hitting this low point, the officer sought counseling from a mental health professional who was able to help him regain his desire to live.

Table 9 below summarizes the psychological and emotional responses that officers experienced at any point in the aftermath of shootings by providing frequency distributions for each specific response among all 113 cases and for the 104 cases with missing data for one or more time frame. The table clearly shows that the proportion of cases in which officers experienced a given response changes only negligibly between the full and reduced samples, with most responses occurring in the same proportion in both samples and the largest changes a mere three percent, which occurred with just two variables.

²⁹ Only one officer reported this response on the instrument. Several other officers who reported no ill effects from their shootings, however, raised this issue in the form of a question at or near the end of their interviews. These officers (often those who reported a sense of satisfaction after the event) asked the interviewer if he believed that there was something wrong with them because they had not suffered any notable negative repercussions from having shot someone. The interviewer asked them why they thought this might be the case. Most of them stated that they had received training, or through some other means had heard, that officers invariably have a hard time in the aftermath of a shooting, that it was normal to have a negative response, and that *ipso facto* they must not be normal. The rest indicated that they derived this impression from having filled-out the questionnaire, reasoning that they were supposed to have had some negative repercussions if the federal government was sponsoring research that obviously focused on negative responses to shootings. Some of the officers in the later category actually apologized to the interviewer for having so few negative responses to report. All of the officers who expressed concern about their positive or neutral responses were relieved when the interviewer opined that there was absolutely nothing wrong with such reactions to shooting someone whose actions had placed innocents in jeopardy.

TABLE 9 GOES ABOUT HERE

Physical Responses

With a sketch of officers' post-shooting thoughts and feelings in hand, attention now turns to what the current data discloses about their physical responses. As was the case regarding psychological and emotional responses, presentation of this information begins with a discussion of how frequently officers experienced each sort considered at any point following the shootings. The most commonly reported physical response was trouble sleeping, which officers experienced following 55 of the shootings.³⁰ Logically enough, the next most frequently experienced response was fatigue, with officers reporting being tired in 52 cases. Officers reported that they cried at some point following 27 of the shootings, experienced a noticeable decline in their desire for food in 19 cases, got headaches in 8 cases, felt nauseated in 5, and reported experiencing some other physical reaction in 21.

These "other" physical reactions were a diverse bunch with no single type reported in more than a handful of cases. Officers experienced elevated levels of energy in 5 cases. In two such cases officers used the terms "added" and "excess" energy to describe this phenomenon, while in the others the officers reported that they experienced "adrenalin rushes" (in one case only upon recounting the shooting to others). In three other cases officers reported trembling or shaking at some point following the shooting. Two of these cases involved patrol officers, one who began to shake while being interviewed by the detectives who investigated the shooting, and the other whose shakes came as he told his wife about the shooting. The third case involved a SWAT marksman who began to tremble at the conclusion of the first call-up after the shooting in question, an incident in which he had killed an armed murder suspect. Just one other response

³⁰ Sleep problems included phenomena such as simply not being able to fall asleep, sleeping and waking in starts and fits, and waking-up in cold sweats. One officer reported that the sweats he experienced were so severe that after waking he would have to strip and re-sheet his bed, take a shower, and put on fresh his sleep clothes before seeking more slumber.

was reported in more than one case: an increase in appetite, which occurred in two cases. Among the responses reported in a single case were a marked increase in sex drive, increased alertness, bouts of diarrhea, and a compulsion to exercise (which the officer in question indulged with a vengeance).

The several physical reactions officers reported are summarized in Table 10. As was the case with thoughts/feelings, frequencies are presented for all 113 cases as well as for the 104-case sub sample. Again, the information indicates that the proportion of cases in which officers experienced a given response does not vary markedly between the full and reduced samples.

TABLE 10 GOES ABOUT HERE

Taken together, the data on psychological/emotional and physical reactions indicate that recurrent thoughts about the event are far and away the most common post-shooting response among the officers studied. When such thoughts entered officers' minds in the wake of more than eight of every ten shootings (83%), none of the other specific responses were experienced in even 50% of the cases, and only four of them – trouble sleeping, fatigue, anxiety, and fear of legal/administrative problems – occurred more than one-third of the time.

Comparison With Previous Research

To get some idea of how the preceding information on officers' post-shooting responses fits with what has been reported in previous research, the figures were compared with the numbers reported in extant studies. The perspective offered by this exercise was limited by the nature of the data presented in the other research because the previous studies employed a variety of instruments and reported findings derived from common items in a variety of ways. None of the studies, for example, measured all of the post-shooting responses included in the instrument used in the current research; one (Artwhol and Christensen, 1997) reported no data whatsoever, and another (Stratton, et al., 1984) reported no information on specific responses in a form that could be translated into the percent of cases where they occurred. The nature of the extant

research thus renders impossible a thorough response-by-response comparison across studies. What is possible is a limited comparison, which at least affords some consideration of how the current data stacks up with what previous research has disclosed about officers' post-shooting responses.

Tables 11 and 12 use all 113 cases to set in relief data from current and previous studies. For thoughts and feelings, comparisons are possible on just four of the nine specific response categories used in the current study. What these comparisons show is that officers in the present study experienced recurrent thoughts at a higher rate than did officers in the other studies, experienced more anxiety, less frequently felt guilt, and were less likely to have nightmares. Where physical reactions are concerned, the other studies provided information in a fashion that allows for comparisons for four of the six specific responses measured in the current study. For one of these, nausea, the two previous studies that provided data present strikingly different pictures of how often officers suffer this reaction. At one end of the continuum lies Campbell (1992), who reported that just 1% of the FBI agents he interviewed reported feeling nauseated. At the other end lies Nielsen (1981), who reported that more than 9 out of every 10 officers (92%) in his study experienced "nausea/upset stomach" following their shootings. Given this range, it is not surprising that the 4% nausea rate among the officers who participated in the current study falls with the range reported in previous research. Where the other three responses that can be compared are concerned, officers in the current study were much more likely to report fatigue than were the officers in the study with the next highest fatigue rate (46% vs. the 24% reported by Campbell), very slightly more likely to report having trouble sleeping than the officers in the study with the next-highest rate (48% vs. the high of 46% reported by Solomon and Horn, 1986), and slightly more likely to suffer headaches than were the officers in the study with the lowest headache rate (7% vs. Campbell's 5%), but far less likely than the officers in the study with the highest rate (Nielsen, 1981, who reported that 25% of the officers he studied experienced headaches in the wake of their shootings).

TABLES 11 AND 12 GO ABOUT HERE

Overall, this limited comparative analysis of how officers in the current and previous studies responded in the wake of their shootings suggests that the pattern of post-shooting reactions among the officers who participated in the present study is not wildly at odds with what previous research has reported. In other words, the initial look at current data paints a picture that is consistent with what previous studies presented; that a large portion of the time officers who shoot citizens experience some notable post-shooting reactions. It must be kept in mind, however, that this first cut at the data is quite coarse because it simply examined officers' post-shooting responses as a whole. A closer look at the current data that examines officers' responses over time, however, presents a substantially different picture from the one that emerged from the initial analysis.

Temporal Variability in Post-Shooting Responses

Tables 13 and 14 present the percentage distributions of cases in which officers experienced each of the several emotional/psychological and physical responses during each of the four post-shooting time periods considered in this study. Perhaps the most striking information conveyed by these tables is a strong tendency for the proportion of cases in which officers experience a given response to diminish as time passes. Across the 51 possible adjacent time comparisons (i.e., first day to first week, first week to three months, three months to post three months = 3 comparisons x 17 response categories = 51), the figures drop in 43 of them, are equal in 5 others, and increase by a single percentage point in the other 3. By the time three months have passed, moreover, the proportion of cases in which officers experienced given reactions decreased by at least 50% in 16 of the 17 response categories,³¹ with 12 of the 16 falling by at least two-thirds.

³¹ The single category that did not drop by at least 50% – fear for self – decreased slightly, from 9% to 8%.

TABLES 13 AND 14 GO ABOUT HERE

Tables 13 and 14 also show that the temporal decrease is so pronounced that by the three-month post-shooting mark very few of the responses were manifest in even 10% of the cases. Only one specific reaction – recurrent thoughts – persisted in more than one-third of the cases, and only two others broke the 10% mark – fear of legal problems and trouble sleeping – both of which were reported in 11% of the cases. Because, as noted above, the directed interviews disclosed that few of the officers who reported recurrent thoughts defined them as negative, the percentage distributions clearly indicate that specific negative post-shooting reactions were quite rare after three months had passed. These low rates strongly suggest that only a small proportion of the officers interviewed suffered any remarkable long-term detrimental consequences from the shootings in which they were involved.

The notion that officers tend to suffer some notable post-shooting reactions in the short term but little disruption in the long run is supported by a more sophisticated look at the data that uses additive scales to measure the negative effects of shootings at each of the four time periods considered in this study. These scales were crafted by simply summing the scores of the 13 response categories that represent negative reactions, plus any “other” reactions – such as anger and depression – that could be construed as negative, for each time period and for each case.³² Because officers could have experienced each of the 13 specific negative responses, plus a theoretically infinite number of “other” negative reactions, the possible scores for the scale range from a low of 0 (for officers who reported no negative responses for each given time frame) to a high of 13 + N (for officers who reported all specific reactions, plus some number of “others”).

TABLE 15 GOES ABOUT HERE

³² Recurrent thoughts and elation were both excluded from these scales, the former because so many of the thoughts officers reported had no negative connotation, the latter because elation is not a negative emotion. Similarly, positive or neutral “other” responses (e.g., pride) were not counted in the scales.

Table 15 displays the means and frequency distributions for each of the four post-shooting adjustment scales. Comparisons of the scale means across all four time frames show a marked drop in the average number of negative responses officers reported as time passes, from 2.88 in the first 24 hours, to 2.05 in the first week, to 1.06 within three months, and finally to .77 by the time three months had passed. Two points stand out in this pattern. One is that the mean of nearly 3 in the initial 24-hour period indicates that the shootings typically led to some notable short-term disruptions for the study officers. The second is that the disruptions abated substantially over time. Two other aspects of the data in Table 15 confirm this second point: 1) the high score drops from 12 in the first 24 hours to 8 after three months have passed and 2) the proportion of cases where officers reported no negative responses rose three-fold over the course of three months, from 21% during the first day to 63% at the post-three month mark. In sum, the data from the post-shooting scales clearly show that while involvement in shootings typically led to some notable negative short-term reactions, the vast majority of the officers experienced very little or no long term fall-out from their shootings. The scope of these changes over time is graphically presented in the line graph presented in Figure 2.

FIGURE 2 GOES ABOUT HERE

Insights From the Directed Interviews

The directed interviews shed substantial light on why post-shooting responses, including those that are positive and neutral, typically diminished so markedly over time. The next several paragraphs detail what the in-depth discussions with the officers disclosed on this point, beginning with the most frequently reported response: recurrent thoughts.

Nearly all of the officers who experienced recurrent thoughts during the first day and week following their shootings reported that their ruminations occurred largely in relation to queries from third parties. Police shootings nearly always prompt major criminal and

administrative investigations and typically raise the curiosity of the involved officers' superiors, peers, family, friends, the press and, sometimes, members of the community at large (e.g., Geller and Scott, 1992). Many of the officers in the current study reported that they were well aware that third parties would be keenly interested in their shootings, and that their knowledge of this prompted them to dwell on the shooting in the immediate aftermath. Their minds were then in fact directed to the shooting by the numerous queries from friends, family, and other officers (including those conducting investigations), press coverage, and, in a few cases, community outcry about it. As time passed and others queried them less frequently (and press coverage and community outcry died down in those cases where notable coverage and outcry occurred), most of the study officers thought about their shooting less and less. Thus, by the time three months had passed since their shooting, fewer than four in ten officers reported experiencing recurrent thoughts. In sum, the directed interviews indicated that the degree to which officers ruminated about their shootings was influenced substantially by third party reactions to the event.

The directed interviews also divulged a link between social reactions and officers' fears about legal/administrative problems, which helps to explain why the proportion of cases in which officers felt such consternation declined over time. Most of the officers who reported being worried about being indicted, disciplined by their agency, and/or sued immediately after their shootings indicated that they felt this way because they had heard of (or knew) other officers who had suffered such fates. In most cases, as the post-shooting investigation moved forward and it became apparent that they would suffer no legal or administrative repercussions, the officers' fears were allayed. In a few cases, on the other hand, the post-shooting investigation only served to heighten officers' concerns. In these cases, some aspect of the investigative process (particularly investigators' questions) typically led officers to feel as if they were suspected of having done something wrong (see discussion of aggravation below for a related theme).

Concerns about legal/administrative repercussions continued for some officers until their department and the criminal justice system cleared them of any wrongdoing. In many cases

these clearances came within a few days, in others it took several weeks, while in others still it took more than three months. As more and more of the shootings were ruled justified as time passed, fewer and fewer officers experienced fear that they might suffer some legal/administrative problem. Thus does an understanding of the temporal pacing of legal and administrative investigations into police shootings helps explain the monotonic decrease in the portion of cases where officers reported fear of legal/administrative problems (see page 66 for additional discussion of the relationship between litigation and post-shooting responses).

In a related vein, feelings of anxiety typically died down as time passed because the matters that worried officers played themselves out over time. For officers who were anxious about the investigation into their shooting, the investigations were typically completed in relatively short order. For officers who were anxious in the immediate aftermath of their shootings about the possibility of being involved in another one in the near future, the anxiety waned as additional shootings typically did not come to pass. In sum, as time passed and the concerns that prompted their anxiety were either resolved or faded as time passed, officers became less anxious.

Social reactions to shootings also go a long way towards explaining why so many officers experienced sleep disruption and fatigue during the first 24 hours after their shootings, as well as why the proportion of officers experiencing these responses rapidly diminished as time passed. Many of the officers reported during the directed interviews that the investigation into their shootings extended into the time when they would normally be sleeping, that discussions with other people (e.g., peers, friends, and family) kept them occupied into some portion of the time that they would normally sleep,³³ or both. With their normal sleep cycle disrupted in the first 24 hours after the shooting, many officers had trouble falling and/or staying asleep when they finally did get to bed. For some officers, the initial disruption bled into the next day or two, which helps account for some sleep problems reported during the week-one time frame. After

³³ One officer, for example, reported that his phone kept ringing and his pager keep going off for several hours after the investigation into his shooting was completed.

the first week had passed entirely, which coincidentally corresponds with the waning of immediate third-party interest, the majority of the officers who had some initial difficulty sleeping got back to their normal slumber routine.

Where fatigue is concerned, the pattern of initial sleep difficulties followed by stabilization helps to explain the decrease in the rate of languor over time. Logically enough, officers who experienced sleep disruptions in the first 24 hours following their shootings tended to be tired. As officers got the rest they needed when things calmed down, their fatigue tended to dissipate. The directed interviews also indicated that third-party responses had a more direct link with the fatigue officers experienced. Several of the officers who complained of short-term fatigue reported that they were simply worn out from the process of repeatedly recounting the shooting to peers, investigators, friends, family, and so on, over the course of several hours.

The directed interviews also disclosed a social component to another physical reaction: crying. The officers who cried typically did so when they told loved ones about the circumstances of their shooting, usually within 24 hours of the shooting.³⁴ For most of these officers the tears came when they recounted the event to their spouses, for others when they told other family members. The thoughts and emotions related to such crying often revolved around concern that the officers felt for their loved ones. Some officers, for example, were upset that the shooting had increased the fear that their spouses felt regarding the officers' occupation. In a different vein, one officer who cried when telling his mother and father that he had been in a shooting reported that he did so because he felt sorrow for his parents. When quizzed about why he felt sorry for them, the officer replied that he felt bad that his parents had to know that their son was a killer.³⁵

³⁴ One poignant exception to this occurred when an officer broke down and cried just a few moments after seriously wounding a shotgun-toting suspect. The officer was the lead man on a search warrant team when he confronted the suspect in a back bedroom. As the suspect began to swing his weapon toward the officer, the officer fired, striking the gunman in the arm. As soon as other officers secured the suspect, the officer in question walked to the front of the house, sat down on the front porch, and began to weep uncontrollably.

³⁵ Additional evidence that discussing the shootings they were involved in prompts some officers to shed tears comes from the directed interviews conducted for this study. Several officers broke down and cried as they related their stories to the PI.

One other post-shooting response that has a clear social component is elation. As discussed earlier, many of the officers who experienced this emotion felt it in the context of having proved to others that they could acquit themselves properly in a crisis setting. For some of these officers the understanding that others felt that they had done a good job came, logically enough, when others told them that they had done a good job, often soon after their shooting.³⁶ As time passed and officers typically got fewer kudos, their sense of elation typically waned. In sum, the directed interviews indicated that officers' post-shooting reactions were influenced substantially by what transpired in the aftermath of shooting incidents.

A Deeper Look at Social Influence on Post-Shooting Adjustment

The current study also produced quantitative evidence that what transpires after the smoke has cleared affects officers' post-shooting adjustment. The instrument used in the current research included a variety of items that tapped several aspects of the post-shooting social milieu that relevant literature identifies as factors that can affect officers' post-shooting adjustment. Previous research (e.g., Artwohl and Christensen, 1997; Solomon and Horn, 1986) has suggested that criticism from third parties can make matters worse for officers who shoot, support from others has a palliative effect, talking about the shooting and its aftermath with others is positive, actions by third parties that aggravate officers can be negative, civil litigation is harmful, taking some time off after shootings can help one's adjustment, killing citizens is more disruptive than wounding them, and counseling sessions with mental health professionals are helpful. The instrument included items that allowed for the development of indicators that afforded the opportunity to examine each of these hypotheses. To wit:

³⁶ One poignant example of the effect of third party praise comes from a case where the officer shot a gunman who was holding a woman and her two children hostage inside their home. The officer reported that the sense of satisfaction he felt over having saved the three lives was deepened further when he received a letter from the woman's husband praising him for his actions and thanking him for saving the lives of his wife and children.

- X A set of dichotomies measuring whether specific categories of people expressed criticism about the actions the officers took during the shootings.
- X Two sets of dichotomies measuring the support that specific categories of people extended to the officers.
- X A set of dichotomies that measured the degree to which officers discussed their shootings with specific categories of people.
- X A set of dichotomies that measured whether a variety of individuals and entities said or did anything in relation to the shooting that aggravated the officers.
- X A dichotomy that measured whether the officer, his/her agency, or both were named as defendants in any civil action related to the shooting.
- X A dichotomy that measured whether the officer took any (non-punitive) time off immediately after the shooting.
- X A dichotomy that measured whether any suspects died.
- X A dichotomy that measured whether the officer attended any mandatory counseling sessions with a mental health professional.

With alpha set at .05 for the one-tailed tests indicated by each hypothesis, assessment of the bivariate associations between these several measures and each of the four post-shooting scales disclosed that officers' mental, emotional, and physical responses to involvement in shootings are indeed related to what occurs in their aftermath, but not always as hypothesized.

Criticism

The instrument included items that queried officers on whether fellow officers, superior officers, family members, and non-police friends had criticized them about their actions in the shooting incident. Such criticism was rare, coming from fellow officers in 13 cases, from superior officers in 10, from friends in 7, and from family members in just 2. Because of the separation problem that obtains when working with exceptionally highly skewed distributions, the relationships between criticism from family members and officers' post-shooting responses were not examined. The instrument did not ask officers about the timing of any criticism that

might have come from their friends, peers, or superiors, but the directed interviews indicated that among those cases where such opinions were expressed, they were typically delivered during the first few days following shootings. Because the timing of the criticism creates a temporal sequencing problem vis-à-vis officers' responses during the first two post-shooting time periods, the relationships between criticism and responses during the first day and week were not examined. What remained to be assessed were the relationships between criticism from friends, peers, and superior officers, on the one hand, and officers' responses during the one week to three month and post-three month time periods, on the other. The sole significant association among the six considered was a weak one between officers' reactions prior to the three month mark and criticism from fellow officers ($r = .20$). Thus the data indicates that criticism from fellow officers is associated with a mild elevation in the degree of negative reaction officers experience in the short term, but not in the long run, and that criticism from friends and supervisory officers bears neither any short nor long term relationship with officers' reactions.³⁷

Support

The instrument also included two sorts of items that measured the degree of support that others offered officers following shootings. One type queried officers about whether each of the following categories of people offered words of support to the officer: fellow officers, superior officers, friends, and family members. The other sort of item asked officers whether each of the following categories of people "provided you with substantial support following this shooting:" their spouse, boyfriend, or girlfriend, other family members, fellow officers, supervisors, or any other person. The data indicate that words of support were almost always offered by fellow officers (in 99% of the cases), superior officers (96%), and family members (94%), while they were notably less likely to be proffered by friends (just 80% of the time). As for "substantial support," officers felt that fellow officers offered this level of support in 90% of the cases, their

³⁷ Because the criticism measures were skewed, the scores for each case in which officers were criticized were examined to see if the skew was masking a relationship. This exercise disclosed no noteworthy patterns.

spouses, girlfriends, or boyfriends did so in 70%, other family members did so in 58%, supervisory officers did so in 51%, and others did in 18%.³⁸

As was the case with criticism, the instrument did not ask officers about the timing of any statements of support were made or when “substantial support” may have been offered. The directed interviews indicated that while supportive statements were often offered within a few days of the shootings, they also came well after the first week had passed. Keeping in mind the caveat that temporal order is not clear-cut for the one-week to three-month time period, the associations between statements of support and officers’ reactions after one week and three months were examined. Assessment of the links between officers’ responses and supportive statements from superiors, friends, and family³⁹ disclosed that support from friends was not associated with officers’ responses during either of the time periods considered, that such support from supervisors was not associated with responses prior to three months but it was (albeit weakly) afterwards ($r = -.20$), and that support from family members bore a weak association with officers’ responses both prior to ($r = -.23$) and after the three month mark ($r = -.24$).

The picture regarding the role that “substantial support” plays in officers’ post-shooting adjustment is also mixed. Because the instrument sought no information about the temporal basis for officers’ judgments about the degree of support proffered by others, the time order of this second measure of support and officers’ responses is problematic. Because of this, consideration of the associations between the degree of support offered by the various parties considered and officers’ responses was limited to the one week to three month and post-three month time frames. The results of the several bivariate models that were estimated indicate the following: 1) the degree of support from spouses, boyfriends, or girlfriends is not associated with post shooting responses, 2) neither is the degree of support from other family members, 3)

³⁸ An item on support from clergy was folded into the “other” category for analysis because less than a handful of officers reported receiving such support.

³⁹ Because there is essentially no variability in verbal indications of support from fellow officers, the potential effect of fellow officers’ supportive statements was not considered.

substantial support from supervisors is a weak correlate of negative responses after one week ($r = -.20$), but bears no relationship with officers' adjustment after three months, 4) substantial support from fellow officers bears a mild association with lower levels of negative responses both prior to ($r = -.27$) and after three months ($r = -.24$), and 5) support from others is not associated with any reduction in negative post-shooting reactions.⁴⁰

In sum, the empirical assessment of the association between support from third parties and officers' post-shooting reactions offers a mixed bag of evidence regarding the relationship between the two phenomena. While displays of support by some third parties are associated with a reduction in the degree of negative responses that officers experience at some points following shootings, the significant associations are not particularly strong, they do not hold across all time frames for all categories of people, and support from some sorts of people bear no association whatsoever with officers' post-shooting adjustment.

Talking With Others

Concerning detailed discussions about shootings, the instrument asked officers whether they had discussed the shooting in detail with their spouse, girlfriend, or boyfriend; other family members; fellow officers; superior officers; and other people. Officers had detailed discussions with their spouses, boyfriend, or girlfriend in 85% of the cases; other family members in 76%; fellow officers in 92%; supervisors in 69%; and other folk in 32%.⁴¹ Ignoring the first two time periods due to the now familiar concerns about temporal sequencing, computation of the zero-order correlations between each of these five categories of people and the response scales for the last two time periods disclosed the following: 1) talking in detail with one's significant other about the shooting was not related to post-shooting responses, 2) detailed discussions with other family members was not related to post-shooting responses, 3) talking with superior officers was

⁴⁰ Another puzzling result is that words of support from "others" are associated with *increased* levels of negative responses after three months ($r = .23$).

⁴¹ As was the case with "substantial support," the instrument included a clergy item regarding discussions that was folded into the "other" category for analysis.

associated with a slight reduction in the degree of negative responses during both the one week to three month and post three month time periods ($r = -.24$ for both), 4) discussing in detail the shooting with fellow officers was associated with a modest reduction in the degree of negative responses during both time periods considered ($r = -.36$ after one week and $r = -.35$ after three months),⁴² and 5) detailed conversations with other third parties was not associated with a reduction in officers' negative responses.⁴³ Thus the data discloses that discussions with some categories of people are associated with some reduction in the degree of negative reactions that officers experience, while discussions with others are not.

Aggravation

The instrument asked officers whether any of the following categories of people and entities caused them aggravation related to the shooting: fellow officers (they did in 14% of the cases), supervisors (yes in 22%), politicians (yes in 3%), non-law enforcement friends (yes in 7%), news media (yes in 30%), prosecutor's office (yes in 4%), suspect's attorney (yes in 20%), suspect's friends and/or family (yes in 12%), and any other person or entity (yes in 12%). The directed interviews indicated that when officers felt aggravation, it was typically about specific words that some individual said or some specific action they took. The following examples illustrate the sorts of cases where officers felt aggravated:

⁴² Additional evidence for the positive effect of discussing the shooting with other officers comes from the study officers' responses to two statements included in the instrument. Fifty-eight percent of the officers agreed with the statement, "It helped me to talk with other officers who had been involved in shooting incidents," and 65% agreed with the statement, "It helped me to share experiences and feelings with others who had been involved in shootings."

⁴³ Again, however, there are slight and modest *increases* in negative reactions after one week ($r = .19$) and three months ($r = .33$), respectively.

- X An officer reported being quite aggravated with one of his peers who was present at the shooting in question for repeatedly showing up at his calls for no legitimate reason in the weeks following the incident.
- X An officer was furious with a deputy district attorney who possessed aspirations for higher office for “playing politics” with his shooting by repeatedly discussing it in a negative light with members of the press.
- X Several officers were upset by some aspect of the formal investigation into their shootings. Among these cases was one in which the officer was peeved when one of the detectives accused him of being less than forthright about the number of rounds he fired because the detective was unaware that many SWAT officers do not carry fully-loaded clips in their assault rifles,⁴⁴ and another where the officer felt he was being judged too harshly by his department’s shooting review board when they criticized him for not using Spanish when he ordered an English-speaking Hispanic suspect to “drop the knife.”
- X Several officers were incensed with particular journalists and/or news organizations for grossly misrepresenting pertinent facts about their shootings on the air, in print, or both.
- X A few of the officers who checked the “other” category were aggrieved with their spouses for failing to offer them the support they felt that they deserved.⁴⁵

Estimation of the zero-order correlations between the several sources of aggravation and officers’ responses during the later two time frames disclosed the following: 1) Aggravation from peers, superior officers, and the prosecutor’s office was associated with higher levels of negative responses after both one week and three months. For aggravation with fellow officers,

⁴⁴ The officer in question carried a standard 30 round clip in his assault rifle, but, like many SWAT officers, only kept 28 bullets in it in order to relieve the pressure on the spring that pushed fresh ammunition into the breech during the firing cycle. The investigator had never heard of this practice and thus thought that the officer must have fired two more rounds than he was admitting to.

⁴⁵ Three male officers in particular expressed great anger at their wives for the way they reacted to the shooting. In these cases the officers reported that their spouses were antagonistic towards them, even to the point of telling the officers that they should have figured out some way of resolving the situation without shooting anyone. All three of these officers (along with nine others) agreed with the statement that, “I was disappointed with my spouse/boy/girlfriend’s reaction to the incident.”

$r = .44$ at one week plus and $r = .27$ after three months; for superior officers the figures are .37 and .34, respectively, and for the prosecutor's office they are .42 and .40 respectively. 2) Aggravation from the news media and "other" sources was associated with higher levels of negative responses after three months, but not before; with three month-plus correlations of .22 and .27, respectively. 3) Aggravation with suspects' attorneys and non-police friends was not associated with officers' responses at either time interval.⁴⁶

Time Off

Officers took non-punitive department mandated time away from work following 69 of the cases. Because the days off were taken during the first week following the shootings, the associations between time off and post-shooting reactions were estimated for the one-week to three month and post-three month time frames only. The zero-order correlations indicate that taking some time off is associated with a mild reduction in negative reactions prior to the three-month mark ($r = .18$) but that it is not associated with long-term reactions.

Civil Litigation

Fourteen of the cases resulted in civil litigation wherein the officer, the officer's department, or both were named as defendants. Because such litigation was typically filed and adjudicated well after three months have passed, the only litigation-reaction link assessed was that between the post-three month response scale and whether a civil claim was filed (a 0-1 dichotomy). Contrary to expectations, there was no relationship between civil litigation emanating from the shooting and officers' long-term post-shooting adjustment.⁴⁷

⁴⁶ The link between responses and aggravation with politicians was not estimated because so few officers reported being aggravated with politicians.

⁴⁷ One interesting aspect of the civil action picture concerns the relationship between litigation and fear of legal/administrative problems. Among the 14 cases that did result in civil claims, officers reported harboring fears of legal/administrative problems at some point following the shooting in just six. By the time three months had passed, this number had dropped to just three. Another thing for readers to keep in mind is that civil litigation could have been filed after data collection was completed in those cases in which the interviews were conducted within three years of the shootings.

Mental Health Services

More striking still was the finding that attending department-mandated meetings with mental health professionals (MHPs) in the wake of shootings was not associated with officers' reactions. The instrument included an item that asked the officers whether they had "spoken with a mental health professional (e.g., psychologist, psychiatrist) about the shooting?" The response categories were "yes, my department required me to do so," "yes, I did so on my own," and "no." Officers were instructed to check all categories that applied to them. Officers spoke with no MHP in 16 of the cases, attended only mandatory sessions in 79, attended only sessions with a counselor they sought on their own in 4, and sought out additional counseling after attending mandatory sessions in the remaining 14 cases. A measure of mandatory counseling was crafted by joining the 79 cases in which the sole sessions attended were mandatory with the 14 in which officers sought subsequent sessions on their own, yielding a dichotomy with a distribution of 93 cases where officers attended mandatory meetings and 20 where they did not. Because the mandatory sessions that officers attended typically took place during the first seven days following shootings, consideration of the associations between mandatory counseling sessions and officers' reactions was limited to the one week to three month and post-three month time periods. There were no significant differences in response scores between those cases where officers attended mandatory meetings with MHPs and those where they did not at either time period ($r = .06$ and $-.02$ for pre- and post-three months, respectively). Because the null findings regarding the effects of mental health counseling were unexpected, the issue of officers' interactions with MHPs will be revisited in some depth in the concluding section of this report.

Suspect Injury

All four post-shooting scales were regressed on a dichotomous measure of whether the shooting led to the death of any suspects (at least one suspect died in 65 of the 113 cases). None of the associations was significant.

Previous Shootings

Thirty-three of the shootings in the present sample involved officers who had previously shot someone during their careers in law enforcement. This aspect of the data set affords an opportunity to examine whether post-shooting adjustment following a given shooting is affected by involvement in previous shootings. It could be that there is a cumulative effect of shootings so that negative responses following subsequent shootings are exacerbated by having been involved in previous ones. On the other hand, it could be that involvement in previous shootings serves to reduce the degree of negative post-shooting response in subsequent shootings because officers are familiar with these events and related post-shooting procedures. In order to assess whether there is evidence of either sort of effect in the present data, the sample was first divided into shootings that were an officers first (or only) and shootings by an officer that had been involved in a previous shooting. Each of the four post-shooting scales were then regressed on the binary measure created by the sample subdivision and the findings from these bivariate models were then checked with ANOVA. The analysis disclosed no significant differences between the two “groups” of shootings during the first day and first week following shootings, but that officers who had been in previous shootings experienced slightly higher levels of distress after the first week ($r = .24$) and after three months ($r = .23$). These findings suggest that shootings may have a cumulative effect on officers’ longer term post-shooting adjustment, but that involvement in previous shootings does not exert effects on short term adjustment.⁴⁸

The Relationship Between Reactions After and During Shootings

Scholars who study how people react to involvement in traumatic events have recently begun to investigate the notion that post-event responses are influenced by perceptual distortions during them. Using the term “peritraumatic dissociation” to describe alterations in perception

⁴⁸ The same sort of analysis was conducted with the three distortion scales to assess whether previous shootings affected officers’ reactions during subsequent ones. There were no significant differences in levels of distortions experienced during shootings that were officers’ first and subsequent ones.

during traumatic events, these researchers have assessed the relationship between perceptual distortions and post-event responses in populations such as combat veterans (e.g., Marmar et al., 1994), crime victims (e.g., Griffin et al., 1997), and emergency service personnel who responded to mass disasters (e.g., Weiss et al., 1995). These studies have consistently found a link between dissociative reactions and post-event responses, with subjects who experience higher levels of distortion tending to have more problems in the wake of traumatic episodes.

The measures of perceptual distortions and post-shooting responses in the current data afford an opportunity to investigate whether peritraumatic dissociation and post-event adjustment are likewise associated among police officers who shoot citizens. The first step in executing this opportunity was to estimate the bivariate relationships between the three distortion measures (i.e., prior to firing, upon firing, and overall) and the post-shooting scales for each of the four time periods. With alpha set at .05 for one-tailed tests, just 2 of the 12 correlations were significant. Both of these were weak and both pertained to distortions that occurred as officers were firing: when officers experienced higher levels of distortion upon pulling the trigger, they tended to suffer from slightly higher levels of negative responses in the first day and week following the shooting ($r = .18$ and $.17$, respectively).

The second step in the investigation into the relationship between distortion and post-shooting response was to examine the zero-order relationships between the three distortion scales and each of the 13 specific negative post-shooting responses that were measured in the current study. This exercise disclosed several significant associations across the four time periods (with alpha set at .05 for one-tailed tests). During the first 24 hours, three responses were correlated with at least one of the distortion measures: appetite loss ($r = .16$ upon firing and $r = .17$ for total distortion), fatigue (prior, $r = .18$, upon firing, $r = .23$, and total, $r = .23$), and sadness (upon firing, $r = .21$). During the first week, there were four negative responses that were significantly associated with perceptual distortions during shootings: appetite loss ($r = .16$ upon firing), fatigue ($r = .18$ upon firing and $r = .16$ total), numbness ($r = .16$ upon firing and $r = .17$ total), and sadness (prior, $r = .25$, upon firing, $r = .27$, and total, $r = .29$). Between the one week and three

month mark, the sole significant association was between fatigue and distortions while firing ($r = .19$). Finally, after three months had passed, both sadness and guilt were significantly related with all three distortion measures. The correlations for sadness were as follows: prior, $r = .23$, while firing, $r = .21$, and total, $r = .25$. For guilt, the statistics were $r = .24$ for prior, $r = .18$ while firing, and $r = .24$ for total distortion.⁴⁹

The final step in the examination of the link between dissociative reactions during shootings and post-shooting adjustment was to look at the relationships between distortion and the two specific responses that were not defined as negative: elation and recurrent thoughts. With alpha set at .05 for two-tailed tests (because there is no expectation of direction), this exercise disclosed that both responses bore short-term significant relationships with all three distortion scales. When officers experienced higher levels of distortion prior to shooting, as they shot, and overall, they were more likely to experience elation during both the first 24 hours and the rest of the initial week, but not afterwards. The first-day correlations between elation and distortion were as follows: prior, $r = .28$, during, $r = .25$, and total, $r = .30$. The statistics for the first week were $r = .23$, .40, and .36, respectively. Where recurrent thoughts are concerned, significant associations were observed only during the first week, with prior, $r = .21$, during, $r = .24$, and total, $r = .25$.

Some of the research that examines the link between distortions during traumatic episodes and post-event adjustment has also examined the possibility that feelings of fear for one's safety during such events might lead to increased difficulties afterwards (e.g., Griffin et al., 1997). In order to round out consideration of the relationship between officers' reactions during shootings and their post-shooting adjustment, the association between fear for self and negative post-shooting responses in the current data was examined. Three indicators of fear for self were

⁴⁹ In another unexpected turn of events, the likelihood that officers would cry at certain time periods *decreased* as the degree of distortion they experienced during shootings increased. The likelihood of crying in the first week following a shooting was lower when officers experienced more distortions prior to firing ($r = -.22$). The likelihood of crying between one week and three months post-shooting dropped as officers' during and total scale scores increased ($r = -.23$ and $-.20$, respectively).

used in this exercise: the two dichotomies that measured fear prior to and while firing, plus a three-step scale that summed the scores from the two binary measures (i.e., 0 = no fear, 1 = fear either prior to or while firing and 2 = fear at both times). With alpha set at .05 for one-tailed tests, zero-order correlations between these three fear measures and the four post-shooting scales disclosed the following: 1) All three fear measures were associated with mild to moderately higher scores on the first day post-shooting response scale ($r = .37$ for prior fear, $r = .26$ for fear while firing, and $r = .35$ for total fear). 2) The strength of the associations between fear and negative reactions increased slightly during the first week (to $.38$ for prior fear, $.37$ for fear while firing, and $.41$ for total fear), then dropped after that (during the one week to three month time frame $r = .19$ for prior fear, $.20$ for fear while firing, and $.22$ for total fear, while only prior fear bore a significant association with the post-three month response scale [$r = .17$]). In sum, assessment of the relationship between fear during shootings and negative reactions after them disclosed a link between the two that was modest during the first 24 hours, grew in strength a bit after the first day, and then declined markedly as time passed.

The following points summarize what the present data disclose about officers' experiences in the wake of shootings: 1) officers experienced a wide variety of psychological, emotional, and physical reactions to being involved in shootings, 2) the single most commonly experienced reaction was recurrent thoughts, which officers experienced following more than eight out of ten shootings, 3) no other single response was reported in even half of the cases, 4) while most of the shootings led to some notable short-term disruption in the involved officers' lives, in most cases negative reactions dissipated substantially as time passed, 5) officers' post-shooting reactions are influenced by how third parties respond to shootings events, and 6) officers' post-shooting reactions are related to the thoughts, feelings, and physical reactions they experience during shooting events.

With the above information on officers' responses after shootings in hand, attention now turns to a discussion that summarizes the findings of this study, highlights some of the policy implications if it, and points out some needs for additional research on officers' reactions to

involvement in shootings.

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The preceding pages contain numerous findings about a variety of topics regarding police officers' responses to involvement in shootings. Perhaps the single most salient point among them is that the act of shooting another human being typically did not produce lasting disruption in the lives of the officers studied. It is indeed remarkable that the officers' involved in more than half of the shootings reported absolutely no negative psychological, emotional, or physical responses after one week had passed since the incident and that the percentage of cases in which officers were reaction-free increased to nearly two-thirds at the three month mark. Additional analysis undertaken to gain some sense of how the current data fits with what previous research has reported about officers' long-term adjustment places this key point in a comparative context.

As noted above, two previous studies reported on the long-term effects of shootings on police officers. Stratton et al. (1984) and Solomon and Horn (1986) used different criteria for classifying the severity of officers' reactions, yet both reported that a similar proportion of officers experienced notable long-term problems. Stratton et al. reported that 31% of the deputies they queried indicated that the shootings in which they were involved had a substantial long-term impact on them, while Solomon and Horn reported that 28% of the officers in their study had "severe" long-term reactions. Following the logic that Solomon and Horn used to judge the severity of post-shooting reactions (see discussion on page 74 for details of the measurement scheme), officers in the current study were deemed to have had a "severe" long-term reaction when they experienced two or more negative responses after three months had passed since their shootings. Analysis disclosed that 19% of the cases meet these criteria. With fewer than one in five shootings producing "severe" long-term reactions, it is evident that officers in the current study were far less likely to suffer protracted problems than were their peers who participated in previous research.⁵⁰

⁵⁰ Counting three or more negative long-term reactions as "severe" shows an even more dramatic difference between the current and previous research. It yields a "severe" response rate of just 10%.

Why this is so is a question worthy of consideration. One possibility is that the answer lies in the composition of the current sample, which includes a disproportionate number of SWAT officers. SWAT officers, one might reason, would be less likely to suffer serious long-term problems following shootings because they are more aggressive and action oriented than the average police officer. In order to investigate the possibility that the over-sample of SWAT officers in the current study accounts for the low rate of severe long-term reactions, the rate of severe responses among cases involving officers with SWAT experience (N = 65) was compared to the rate for those that involved non-SWAT officers (N = 40). There was no significant difference between the two groups; 20.0% of the SWAT-cop shootings resulted in two or more negative reactions after three months, while the figure for non-SWAT shootings was 18.4% ($Z = .21$ where a score of 1.65 or greater would indicate a significant difference in the predicted direction). The data thus indicate that the presence of a disproportionate number of SWAT officers does not account for the low frequency of severe responses in the present research.⁵¹

Another possible explanation for the markedly lower rate of severe long-term responses in the current data is that it is an artifact of differences between the present and previous studies in instrumentation and other aspects of the methods used to gauge officers' long-term adjustment to involvement in shootings. A brief discussion of how Stratton et al. (1984) and Solomon and Horn (1986) classified the severity of officers' reactions details why this might be so. Stratton et al. provide absolutely no information about the post-shooting time frame to which their usage of the phrase "long-term" applies. They simply present the phrase in the title of a table that includes the percentage distribution of deputies' responses to a single five-point Likert-type item that asked them to rate the degree to which the shooting affected them. Stratton et al. then combined the two highest response categories to yield the 30% long-term severity figure reported above. It is thus clear that the method that Stratton et al. used to classify the severity of

⁵¹Time four scale scores were also regressed on a dummy variable that differentiated the 65 cases where the involved officer had SWAT experience from the 40 others. The result: $r = -.003$.

long-term reactions has virtually nothing in common with the one used in the current research.

The method the current research used to gauge officers' long-term reactions to involvement in shootings shares substantially more in common with the one used by Solomon and Horn (1986), for both base their severity ratings on the number of reactions officers experienced after three months had passed since their shootings. A closer look at precisely how Solomon and Horn classified officers' reactions as severe, however, indicates that the method they used to develop severity rates is not as compatible with the current study as might first appear. Solomon and Horn based their severity rating on a combination of 1) officers' responses to 15 five-step Likert-type items that queried officers about the degree to which they experienced specific negative post-shooting reactions and 2) the length of time that officers reported experiencing each reaction. Officers were deemed to have had a severe reaction when their scores on 2 or more of the 15 items exceeded three *and* they indicated that the response persisted at this level after three months had passed since the shooting.⁵² Because the current study used the *presence* of reactions during a specific time frame (i.e., three-plus months), as opposed to ratings of the strength and duration of reactions, it is clear that there are substantial differences in the methods the two studies used to classify the severity of officers' responses.

It is apparent from the above information that Stratton et al. (1984), Solomon and Horn (1986), and the current study used substantially different methodologies to accomplish the task of divining the severity of officers' long-term reactions. Consequently, it is possible that if all three studies had used the same instrument for measuring officers' post-shooting reactions during specific time frames and the same criteria for scoring the severity of long-term responses that differences between the current and previous findings would not have been so great. In other words, it is possible that the differences in observed severity rates between the current research

⁵² Solomon and Horn report that about 20% of the respondents did not indicate the amount of time they experienced a given reaction. In such cases, the officer was deemed to have had a severe reaction if s/he rated three or more of the reactions at level 4 or 5. Solomon and Horn provide no information about how many of the officers falling into their severe classification came from the 80% who offered temporal information and how many came from the other 20%, nor, for that matter, any information on how many of the 80% who did not fall into the severe classification would have if the secondary criteria were used to classify their reactions.

and previous studies are not due to actual differences in officers' reactions across the three studies, but rather to differences in the methods used to arrive at the figures in question.

Implications for Mental Health Training and Services

Whatever the reason for the comparatively low rate of severe responses in the current data, the fact that the officers involved in fewer than one in five of the shootings examined experienced two or more negative reactions after three months had passed has at least one important implication for training on the aftermath of police shootings. In recent years it has become vogue in some law enforcement training circles to stress the severe negative reactions that befall some officers who shoot (see, e.g., Adams, McTernan, and Remsberg, 1980; see also Everly and Mitchell, 1997 for an example of the more general trend to emphasize negative psychological outcomes following critical incidents of any sort). The present study suggests that this emphasis is inappropriate, and may even be counter-productive. It is inappropriate because stressing the severe responses that infrequently occur paints an inaccurate picture of what officers typically experience following shootings. It may be counter-productive because it may be setting officers up to have more severe reactions than they otherwise might when they do become involved in a shooting.

The power of suggestion is a well-documented phenomenon (see, e.g., Rosenthal and Jacobsen, 1968), and researchers have documented the threat of iatrogenic psychological injury posed by interventions based on the assumption that those exposed to critical incidents will necessarily suffer from exposure (Gist, Lubin, and Redburn, 1999), so telling officers that they can expect to suffer if they get involved in shootings might well help produce such discomfort following shootings. Indeed, as reported in footnote 29, the current sample included several officers who wondered if there was something wrong with them because they did not experience the negative reactions they were told about in training, and one whose reaction was plainly exacerbated by his concern that he was not suffering in the fashion that he had been taught.⁵³ In

⁵³See Higgins (1987) for a discussion of the theoretical underpinnings of this phenomenon.

sum, the present research suggests that training on post-shooting reactions should stress that most officers who shoot do just fine in the long run. Indeed, given the fact that substantial portions of officers who participated in the current study experienced either zero or just a single negative reaction during the first day and week following a shooting (38% and 52%, respectively), training should similarly stress that many officers have mild short-term reactions.

The findings that few officers suffer notable long-term consequences from involvement in shootings similarly suggest that the law enforcement community should re-think some of the post-shooting mental health protocols currently in place around the nation (e.g., mandatory critical incident stress debriefings). Just as training based on the assumption that officers will experience problems in the wake of shootings may set the stage for post-shooting problems, so to can post-shooting procedures based on the assumption that officers need mental health intervention in order to avoid expected problems. Gilbert and Silvera's 1996 work on that they call "overhelping" indicates that attempts of help people who would have done just fine can have the unintended consequence of harming their sense of self-efficacy and thus set the stage for maladjustment by weakening a faculty that is critical for sound adjustment (see page 15 of Gist and Lubin, 1999 for a succinct discussion of this point). Thus should those charged with caring for officers in the wake of shootings be aware of the potential for iatrogenic injury and take steps to ensure that the helping hand they wish to offer does not instead harm.

On the other hand, the evidence that officers often do just fine in the short term and only infrequently experience notable long-term problems should not be taken as evidence that police shootings are no big deal. In the first place, the research clearly indicates that most shootings do lead to notable disruption immediately afterward. In the second place, the research also clearly indicates that shootings can and do lead to substantial long-term tumult for some officers. When officers suffer from combinations of phenomena such as sleep disruption, fatigue, nightmares, and depression more than three months after a shooting, the incident has plainly taken a substantial toll. While such reactions are mercifully infrequent, they are by no means rare and thus constitute a prominent part of the picture of what happens to police officers who shoot.

Consequently, the fact that some officers suffer substantial long-term difficulties following shootings should be presented in police training, but in the context of the larger picture that most officers, following notable short-term disruption, do fine in the long-run. This understanding should also be incorporated into the approach that agencies take to post-shooting mental health procedures.

Another question pertaining to officers' long-term adjustment that was raised by the current data is why participation in mandatory mental health counseling did not reduce the degree of negative reactions officers experienced after the first week following their shootings. The directed interviews shed some light on this question. Many of the officers who attended mandatory counseling reported that they did not view the sessions as a positive experience. Most of the officers who held this opinion viewed the sessions as something their department required only because it was interested in "covering its ass," not because it cared about the officer's well-being. Because they viewed the counseling sessions as a departmental CYA exercise, these officers simply sought to get through the sessions, offering as little information as possible to the MHP with whom they met. Several of the officers who took this approach to required counseling sessions reported to the interviewer that they flat-out lied to the MHP because they did not wish to divulge their thoughts, feelings, and experiences to a stranger who had ties with their department. In a related vein, other officers indicated that they were less than forthright during their counseling sessions because they felt that the MHP they were sent to visit was incompetent. One such officer (who worked for a big city police agency) became quite animated during the directed interview as he described his meeting with the doctor his department sent him to. When the doctor invited him into his office to officer noticed that the glasses he wore were sliding off his head because the temple on one side was missing and that the office was a mess, with books and papers piled all over the place and furniture that was in tatters. The officer assumed that the doctor was either moving into or out of the office, so he asked him which it was. When the doctor replied that he had been practicing there for quite sometime and asked the officer why he inquired about a move, the officer decided that it was unlikely that a doctor who

could not keep his glasses stable on his head and who was unaware that his office was in shambles had anything to offer an officer who had just been in a shooting.

It is thus possible that the null finding regarding the efficacy of mandatory post-shooting meetings with MHPs is a consequence of the context in which the counseling sessions took place. When officers do not feel comfortable, they are not likely to divulge pertinent information about their shootings and what they experienced afterwards. In turn, when officers are not forthcoming during counseling sessions, it is not surprising that the sessions do not benefit them.⁵⁴

Whatever the reason for the finding that mandatory MHP sessions were not associated with long-term reactions, it is clear from the directed interviews that there is substantial room for improvement in the delivery of mental health services to officers who become involved in shootings. The major point in this connection is that agencies must develop protocols that instill confidence among officers where post-shooting mental health counseling is concerned. It should be obvious that unless officers believe that counselors they meet with are competent, have the officers' best interest in mind, and are independent from the police department, that those officers who do suffer in the wake of shootings will be quite unlikely to avail themselves of the mental health assistance they need.

Implications for Immediate Aftermath of Shootings

Other points raised in the directed interviews are relevant to how police agencies manage the aftermath of officer-involved shootings; these pertain to the immediate post-shooting procedures. The vast majority of the officers reported that they had been treated well by their peers and supervisors at the scene of the incident, that the detectives who investigated the shooting treated them fairly,⁵⁵ and that other members of their agency likewise acted in ways that

⁵⁴ It should also be noted here that several officers offered words of praise for the MHP's with whom they met. The officer who was contemplating suicide (see page 49), for example, gave his counselor high marks for recognizing the source and nature of the problem he was experiencing and for helping him to resolve it.

⁵⁵ Officers responded affirmatively to the statement, "I was treated like a suspect during the investigation of the incident" in just five cases.

made them feel comfortable. Officers appreciated it when peers and supervisors followed what the officer felt were appropriate post-shooting procedures (e.g., protecting the shooting scene, honoring officers' requests to call loved ones), expressed concern for them, offered words of encouragement, and let the officer set the tone of interactions; they appreciated it when the detectives explained what they were doing and conducted what the officers felt were thorough investigations; and they appreciated it when others in the agency did their jobs in a professional fashion and inquired about the officers well-being in a non-intrusive manner.

While the directed interviews identified several positive points about how agencies handled the immediate aftermath of shootings, they also disclosed numerous missteps that raised officers' ire. Many of the complaints officers reported focused on how the agency managed matters at the scene of shootings. Some officers reported, for example, that despite their wishes to return to the police station for some peace and quiet, they were required to stay at the scene of the shooting for quite some time as the press arrived and crowds gathered. Others, such as the officer who witnessed a shouting-match between his attorney and the homicide supervisor (described previously), felt that the level of professionalism displayed by detectives fell short of that befitting a major law enforcement investigation.⁵⁶ In a related vein, some officers (such as the SWAT team member mentioned on page 65 who was peeved with the detective who accused him of dishonesty about how many rounds he carried) complained that the detectives who investigated their shootings were not sufficiently competent. Finally, other officers were not pleased with how the agency notified their loved ones of the shooting. Perhaps the most extreme mishandling of a family notification occurred when the involved officer specifically requested that his wife not be told of the shooting. Instead of following the officer's wishes, the department sent a squad car to the officer's house to pick up his wife and bring her to the shooting scene. When the squad car delivered the wife to the scene, she was not allowed to visit

⁵⁶ Another officer reported being a bit upset when his captain called him some hours after a shooting and ranted on for several minutes about how the people managing the investigation were not doing their jobs right. The officer became quite worried that the problems afoot would affect him in a negative manner.

with her husband, but had to wait some distance away. After stewing in her juices for a while about how she was being treated, she demanded a ride back home. When the officer found out what had happened, he was quite upset.

None of the miscues that the officers complained of during the directed interviews appeared to be motivated by maliciousness.⁵⁷ Rather, all seemed to stem from a lack of attention by the agencies that employed the officers to developing sound post-shooting procedures. Agencies can avoid errors of the sorts described above by training their personnel about what officers can experience in the immediate aftermath of shootings. If supervisors, detectives, and other personnel are taught that there is a strong possibility that officers who shoot will be particularly sensitive to the actions of others in the wake of shootings, they will be less likely to engage in un-professional behavior in front of officers, unnecessarily accuse officers of misfeasance, ignore officers' legitimate requests, or take other actions that might perturb officers. Finally, the story of the SWAT officer, the detective, and the 28 rounds in the 30-round clip suggests that agencies should ensure that detectives assigned to investigate officer-involved shootings are familiar with the nuances of the equipment that officers carry and train the detectives not to jump to conclusions

Another set of implications for the investigation of officer-involved shootings comes from the information about officers' reactions during shootings. Because officers so often experience perceptual distortions and so frequently have imperfect recall about specific aspects of shootings (such as the number of rounds they fired), investigators must be aware that officers may not always be able to provide accurate information about what transpired. One implication of this is that investigators should not simply take officers' accounts of what occurred during their shooting as infallible. Rather, they should take officers' accounts as a point of departure for the rest of the inquiry and work back and forth between them and other evidence (e.g., bullet

⁵⁷ One officer did, however, complain that one of the homicide detectives who interviewed him told him a bald face lie about how long she had worked in the homicide unit. The officer believed that the detective was using the lie as a ploy to obtain information about the circumstances of the shooting that she felt the officer was withholding from her. The officer reported that he was hiding nothing from the detectives.

trajectories and the location of shell casings) to develop the most accurate possible picture of what occurred.

A second implication is the flip of the first; investigators should not immediately conclude that officers are being dishonest if they state that they can not recall some aspect of the event or report some information that is not consistent with other evidence. Investigators should realize that officers truly may not be able to recall things or may have sincere beliefs that the inaccurate information they provided is correct. With such understanding in hand, investigators who are faced with problematic statements from officers can then seek to fill in the holes or reconcile conflicting evidence through the investigative process.

A final implication comes from the most extreme form of inaccurate recall reported by study officers: having no recollection of firing one's gun. That officers can shoot and not know it suggests that investigators should check the weapons of all officers who were immediately present when the shooting occurred. Like everything else the investigators do, the reason for doing so should be explained to all officers whose guns are inspected so that the officers who reported that they did not fire do not feel as if they are being accused of lying about their actions during the shooting. By checking the weapons of all officers who could reasonably have fired and explaining why they are doing so, detectives can conduct thorough investigations without putting officers off. In sum, being cognizant of what officers may experience during shootings can help detectives conduct the thorough investigations that are necessary when the police shoot citizens.

Future Research Needs

As the preceding list of implications indicates, the current study has yielded a good bit of useful knowledge about officers' responses to involvement in shootings. One area where the study is of limited utility, however, is on the crucial question of why officers respond as they do. Although the study did develop substantial information on the correlates of the reactions that officers experience during and after shootings, methodological limitations circumscribed its capacity to yield firm conclusions about the determinants of responses. One type of limitation

lies in the measurement realm, where consideration of the validity and precision of some indicators raises the possibility that some findings might not adequately represent the true relationships in question. Take, for example, the finding that fear for self and adrenalin rushes during shootings are only weakly associated with perceptual distortions. The literature on the role that psycho-physiological processes play in human perception during high stress situations suggests that the relationships should be substantially stronger. It is possible that the weak observed associations are a result (at least in part) of limitations in officers' ability to accurately rate their mental/emotional and physiological states during shootings; after all, we have clear-cut evidence that other aspects of officers' perceptions are often less than perfect. Moreover, even if self-ratings can produce valid information regarding feelings of fear and the presence of elevated adrenalin levels, the simple yes/no indicator used in the current study could be masking the stronger associations that more precise self-rating scales (e.g., of the Likert variety) could disclose.

Another limitation with the present research where causality is concerned is that none of the models estimated to examine the relationships between officers' reactions and the various potential determinants of them accounted for the effects of other factors. This limitation is especially salient regarding what officers experienced in the wake of their shootings, where analysis disclosed that most of the numerous significant correlates of officers' reactions bore only mild associations. Given the weakness of these associations, the introduction of even modest controls could render the associations non-significant. In short, because it is quite possible that the observed associations between the significant predictors and officers' post-shooting reactions are spurious, the findings regarding these associations should be viewed with substantial caution.

Multivariate methods were not used to address the spuriousness issues in the current research for the simple reason that there were too few cases per predictor. With more than 30 variables considered, the 113 shootings examined simply do not provide a sufficient number of cases to yield stable multivariate parameter estimates. Future research on officers' reactions to

shootings can address this limitation by 1) using data reduction techniques to decrease the number of predictors without losing crucial information and 2) collecting data from larger samples. By estimating the multivariate models that these steps would permit, future research could substantially increase the scope of knowledge regarding the determinants of officers' post-shooting adjustment. Future research should also develop better measures of factors such as the fear and adrenalin rushes that officers can experience while involved in shootings in order to enhance our comprehension of why officers react as they do during such events. To conclude, while the current study yielded a substantial amount of information about police responses to officer-involved shootings, it is clear that additional research on the topic is needed to further clarify our understanding of this important matter.

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<i>Thought/Feeling</i>	<i>Current Study</i>	<i>Campbell</i>	<i>Nielson</i>	<i>Artwohl and Christensen</i>
Disbelief	42%	37%	N/M	N/M
Fear for Self	41%	20%	43%	N/M
Fear for Others	60%	40%	29%	N/M
Need to Survive	30%	22%	N/M	N/M
Adrenalin Rush	55%	46%	N/M	N/M
Intrusive Thoughts	14%	N/M	N/M	36%
Other	33%	N/M	N/M	N/M

^a N/M = Not Measured

<i>Thought/Feeling</i>	<u>Prior to Firing</u>	<u>Upon Firing</u>
	<i>Percent</i>	<i>Percent</i>
Disbelief	32%	34%
Fear for Self	35%	30%
Fear for Others	54%	49%
Need to Survive	27%	23%
Adrenalin Rush	44%	46%
Intrusive Thoughts	10%	9%
Other	30%	30%

<i>Distortion</i>	<i>Current Study</i>	<i>Campbell</i>	<i>Solomon and Horn</i>	<i>Neilsen</i>	<i>Artwohl and Christensen</i>
Tunnel Vision	51%	44%	37%	43%	82%
Visual Detail	56%	N/M	18%	N/M	65%
Diminished Sound	82%	42%	51%	27%	88%
Intensified Sound	20%	N/M	18%	N/M	17%
Slow motion	56%	34%	67%	64%	63%
Fast Motion	23%	N/M	15%	N/M	17%
Other Distortion	13%	N/M	N/M	N/M	UNK

^a N/M =Not Measured. UNK = Unknown, which indicates that the response was measured in some fashion, but that the nature of the item used does not allow for direct translation into the specific response in the current study.

<i>Distortion</i>	Prior to Firing	Upon Firing
	<i>Percent</i>	<i>Percent</i>
Tunnel Vision	31%	27%
Heightened Visual Detail	37%	35%
Both Visual Distortions	10%	11%
Auditory Blunting	42%	70%
Auditory Acuity	10%	5%
Both Aural Distortions	0%	9%
Slow Motion	43%	40%
Fast Motion	12%	17%
Both Time Distortions	0%	2%
Other	6%	9%

Table 5. Distributions of Three Distortion Scale Scores for 113 Police Shootings			
	Prior to Firing	Upon Firing	Overall
<i>Score</i>	<i>Percent of Cases</i>	<i>Percent of Cases</i>	<i>Percent of Cases</i>
0	12%	6%	5%
1	18%	18%	6%
2	33%	19%	6%
3	31%	43%	11%
4	5%	11%	16%
5	1%	4%	17%
6	0	0	29%
7	0	0	6%
8	0	0	3%
9	0	0	0
10	0	0	1%

Table 6. Zero-Order Correlations Between 12 Specific Perceptual Distortions During 113 Shooting Incidents (Correlations significant at the .05 level are in boldtype)

	x1	x2	x3	x4	x5	x6	x7	x8	x9	x10	x11	x12
<u>Tunnel Vision</u>	----											
<u>Prior</u>												
<u>Visual Detail</u>	-.38	----										
<u>Prior</u>												
<u>Loud Sound Prior</u>	-.21	.23	----									
<u>Reduced Sound</u>	.21	.03	-.28	----								
<u>Prior</u>												
<u>Slow Motion</u>	.22	.14	-.11	.28	----							
<u>Prior</u>												
<u>Fast Motion Prior</u>	.02	-.03	.24	-.05	-.33	----						
<u>Tunnel Vision At</u>	.50	-.19	-.01	.08	-.02	.09	----					
<u>Visual Detail At</u>	-.10	.61	.06	.10	.10	-.02	-.27	----				
<u>Loud Sound At</u>	.10	-.00	.14	.09	.03	.25	-.04	.06	----			
<u>Reduced Sound</u>	.09	.07	-.04	.23	.03	-.06	.29	.10	-.17	----		
<u>At</u>												
<u>Slow Motion At</u>	-.01	.18	-.04	.24	.46	.01	.23	.10	-.07	.32	----	
<u>Fast Motion At</u>	.11	.05	.30	-.08	-.05	.44	-.05	.02	.28	-.18	-.31	----

<u>Table 7: Multidimensional Scaling Coordinates for Distortion Co-occurrence</u>		
<i><u>Distortion</u></i>	<i><u>Dimension 1</u></i>	<i><u>Dimension 2</u></i>
Prior Tunnel Vision	.10	1.44
Prior Visual Detail	-.37	-1.61
Prior Auditory Amplification	1.34	-.35
Prior Auditory Attenuation	-.83	.41
Prior Slow Motion	-.89	.12
Prior Fast Motion	1.37	-.05
Tunnel Vision At	.07	1.42
Visual Detail At	-.35	-1.41
Auditory Amplification At	1.26	-.16
Auditory Attenuation At	-2.30	.05
Slow Motion At	-.79	.28
Fast Motion At	1.38	-.14

Table 8. Number of Shots Fired by Subject Officers and Number of Shots They Thought They Had Fired in 113 Shootings

<i>N of Shots Officers Actually Fired</i>	<i>N of Cases in Which Officers Fired Given Number of Shots</i>	<i>N of Cases in Which Officers' Recall was Correct</i>	<i>N of Cases in Which Officers Recalled a Range That Included Actual N of Shots</i>	<i>N of Cases in Which Officers Thought They Fired Fewer Rounds</i>	<i>N of Cases in Which Officers Thought They Fired More Rounds</i>	<i>N of Cases in Which Officers had no Clue how Many Rounds They Fired</i>
1	33	32	0	1	0	0
2	16	14	0	1	0	1
3	14	12	0	1	1	0
4	18	11	0	4	1	2
5	7	2	1	4	0	0
6	8	3	1	2	1	1
7	3	1	0	2	0	0
8	3	0	0	2	1	0
9	3	1	1	1	0	0
13	1	0	0	0	0	1
14	1	0	0	1	0	0
15	1	0	0	0	0	1
16	1	0	0	1	0	0
18	1	0	0	1	0	0
28	2	0	0	0	0	2
41	1	0	0	0	0	1
<i>Total Cases</i>	<i>113</i>	<i>76</i>	<i>3</i>	<i>21</i>	<i>4</i>	<i>9</i>

<u>Table 9. Thoughts/Feelings Experienced at Any Point Following Shooting</u>		
	<i>All 113 Cases</i>	<i>104 Cases Fully Measured</i>
<i>Thought/Feeling</i>	<i>Percent</i>	<i>Percent</i>
Elation	29%	31%
Sadness	26%	26%
Numbness	20%	21%
Recurrent Thoughts	83%	84%
Anxiety	40%	43%
Guilt	12%	13%
Nightmares	18%	19%
Fear for Safety	18%	18%
Fear of Legal/ Administrative Problems	34%	37%
Any Other Thought or Feeling	42%	41%

<u>Table 10. Physical Responses Experienced at Any Point Following Shooting</u>		
	<i>All 113 Cases</i>	<i>104 Cases Fully Measured</i>
<i>Physical Response</i>	<i>Percent</i>	<i>Percent</i>
Nausea	4%	4%
Appetite Loss	17%	17%
Headache	7%	7%
Fatigue	46%	43%
Crying	24%	24%
Trouble Sleeping	48%	50%
Other Physical	19%	19%

TABLE 11. Percent of Cases In Which Officers Experienced Specific Thoughts/Feelings at Any Point After Shooting Incidents, Across Different Studies^a					
<i>Thought/Feeling</i>	<i>Current Study</i>	<i>Campbell^b</i>	<i>Solomon and Horn^c</i>	<i>Neilsen^d</i>	<i>Gersons^e</i>
Elation	29%	N/M	N/M	N/M	N/M
Sadness	26%	UNK	N/M	N/M	N/M
Numbness	20%	N/M	43%	N/M	N/M
Recurrent thoughts	83%	23%	44%	58%	76%
Anxiety	40%	25%	UNK	33%	N/M
Guilt	12%	N/M	37%	N/M	19%
Nightmares	18%	UNK	34%	N/M	UNK
Fear for Safety	18%	N/M	UNK	N/M	N/M
Fear of Legal/Admin. Problems	34%	N/M	N/M	N/M	N/M
Any Other Thought or Feeling	42%	UNK	UNK	UNK	UNK

^a N/M = Not Measured. UNK = Unknown, which indicates that the response was measured in some fashion, but that the nature of the item used does not allow for direct translation into the specific response in the current study.

^b Campbell’s data reflect reactions during the first week following shootings. The figures presented are based on the N of 167 that Campbell stated he used to percentage responses, although the raw frequencies and percentages he reports do not always match. Campbell used a single item that asked agents whether they experienced “sadness/crying/depression.” Sixteen percent (16%) of the agents responded affirmatively to this item. Given the nature of the item, however, it is not possible to determine how many of these agents experienced sadness.

^c Solomon and Horn’s data apparently reflect officers’ responses at any point following shootings. The figures reported in the table reflect the percentage of respondents who rated the various items at a level of three or higher on a Likert scale with a range of 1-5 that was designed to tap the degree to which the various responses “disrupted” the officer’s life.

^d Nielsen’s data reflect reactions during the first week following shootings.

^e Gersons’s data apparently reflect officers’ responses at any point in time following shootings. The guilt item he used asked officers whether they experienced “Guilt about surviving.”

Table 12. Percent of Cases in Which Officers Experienced Particular Physical Responses at Any Point After Shooting Incidents, Across Different Studies^a

<i>Physical Response</i>	<i>Current Study</i>	<i>Campbell b</i>	<i>Solomon and Horn c</i>	<i>Nielsen d</i>	<i>Gersons e</i>
Nausea	4%	1%	N/M	92%	N/M
Appetite Loss	17%	N/M	N/M	N/M	N/M
Headache	7%	5%	N/M	25%	N/M
Fatigue	46%	24%	N/M	14%	N/M
Crying	24%	UNK	N/M	N/M	N/M
Trouble Sleeping	48%	32%	46%	27%	43%
Other Physical	19%	UNK	UNK	UNK	N/M

^a N/M = Not Measured. UNK = Unknown, which indicates that the response was measured in some fashion, but that the nature of the item used does not allow for direct translation into the specific response in the current study.

^b Campbell’s data reflect reactions during the first week following shootings. The figures presented are based on the N of 167 that Campbell stated he used to percentage responses, although the raw frequencies and percentages he reports do not always match. Campbell used a single item that asked agents whether they experienced “sadness/crying/depression.” Sixteen percent (16%) of the agents responded affirmatively to this item. Given the nature of the item, however, it is not possible to determine how many of these agents cried. In a related vein, Campbell did include an “other” physical response category in his study. Because the specific response categories he used are different from those in the current study, however, his “other” category is not directly comparable to the one used in the current study.

^c Solomon and Horn’s data apparently reflect officers’ responses at any point following shootings. The figure reported for “trouble sleeping” is the percentage of respondents who rated “sleep disturbances” at a level of three or higher on a Likert scale with a range of 1-5 that was designed to tap the degree to which sleep disturbances “disrupted” the officer’s life.

^d Nielsen’s data reflect reactions during the first week following shootings. The figures for the response category “Nausea” are based on an item that asked officers whether they had experienced “Nausea/Upset Stomach.” Nielsen reported two sets of figures on post-shooting fatigue; one that he identifies as a “physical symptom” and one that he identifies as an “emotional symptom.” The 14% figure in the table is what he reported under the physical symptom heading (he reported that officers experienced emotional fatigue in 25% of the cases). Nielsen did include an “other” physical response category in his study. Because the specific response categories he used are different from those in the current study, however, his “other” category is not directly comparable to the one used in the current study.

^e Gersons’s data apparently reflect officers’ responses at any point in time following shootings. The 43% reported for “trouble sleeping” is the percentage of respondents who reported experiencing “sleep disturbances.”

Table 13. Percent of Cases in Which Officers Experienced Particular Thoughts or Feelings During Four Post-Shooting Time Periods				
<i>Thought/Feeling</i>	<i>First 24 Hours (N=112)</i>	<i>First Week (N=113)</i>	<i>Within Three Months (N=111)</i>	<i>After Three Months (N=105)</i>
Elation	26%	19%	11%	5%
Sadness	18%	17%	5%	5%
Numbness	18%	7%	4%	3%
Recurrent thoughts	82%	74%	52%	37%
Anxiety	37%	28%	13%	10%
Guilt	10%	5%	6%	2%
Nightmares	13%	13%	10%	6%
Fear for Safety	9%	10%	9%	8%
Fear of Legal Administrative Problems	31%	25%	19%	11%
Any Other Thought or Feeling	33%	23%	20%	14%

Table 14. Percent of Cases in Which Officers Experienced Particular Physical Responses During Four Post-Shooting Time Periods				
<i>Physical Response</i>	<i>First 24 Hours (N=112)</i>	<i>First Week (N=113)</i>	<i>Within Three Months (N=111)</i>	<i>After Three Months (N=105)</i>
Nausea	4%	4%	0%	0%
Appetite Loss	16%	8%	2%	1%
Headache	6%	4%	1%	1%
Fatigue	39%	26%	7%	5%
Crying	17%	7%	2%	2%
Trouble Sleeping	46%	36%	16%	11%
Other Physical	18%	11%	12%	6%

Table 15. Frequencies of Post-Shooting Response Scale Scores for Four Time Periods

<i>Scale Score</i>	<i>First 24 Hours</i> (N=112)	<i>First Week</i> (N=113)	<i>Within Three</i> <i>Months</i> (N=111)	<i>After Three</i> <i>Months</i> (N=105)
0	23	42	64	66
1	20	17	20	19
2	15	14	10	10
3	16	11	4	4
4	12	13	6	3
5	7	6	2	2
6	8	6	4	0
7	1	2	0	0
8	7	0	1	1
9	2	1	0	0
10	0	0	0	0
11	0	0	0	0
12	1	0	0	0
13	0	1	0	0
<i>Mean</i>	2.88	2.05	1.06	.77

Figure 1: Scatterplot of Multidimensional Scaling of Perceptual Distortions

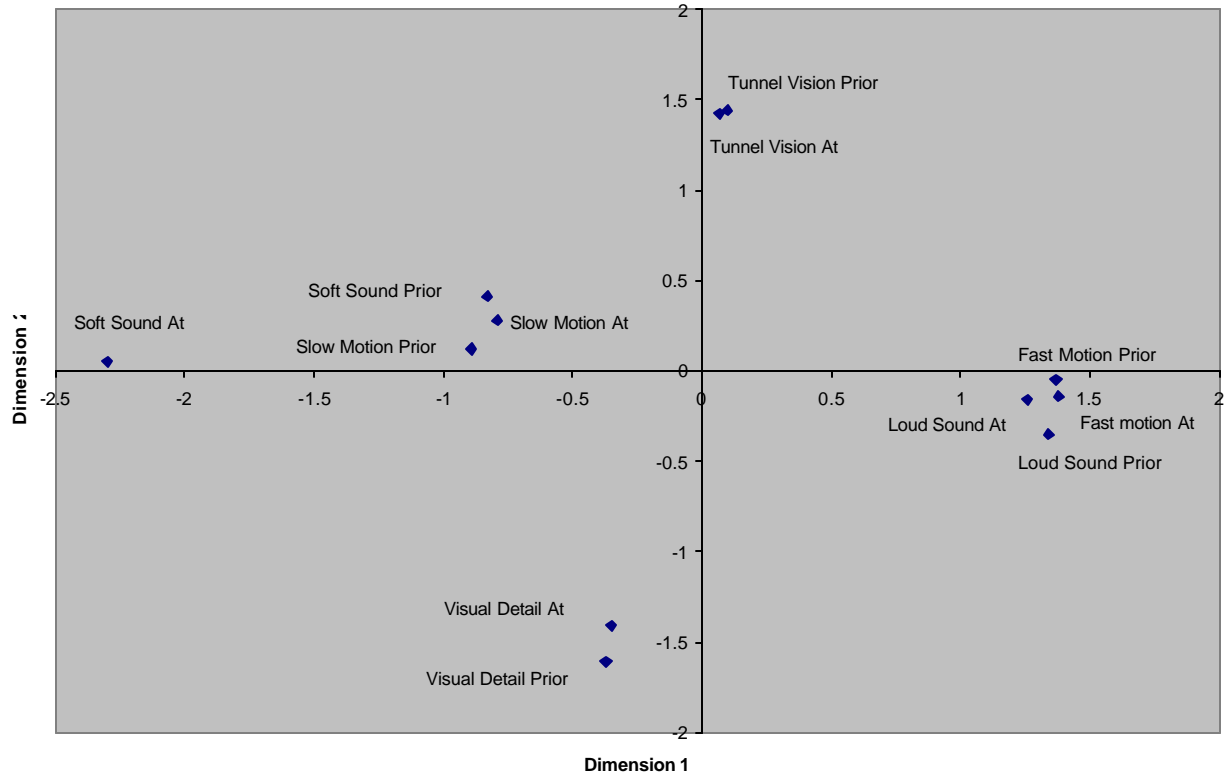


Figure 2: Percent of Cases With Given Post-Shooting Scale Scores for Four Time Periods

