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The TASER as a Less Lethal Force Alternative

Findings on Use and Effectiveness in a Large Metropolitan Police Agency

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Despite its adoption by more than 8,000 law enforcement agencies in the United States and abroad, there is little empirical research examining use of the TASER by police officers. This article investigates the use and effectiveness of the weapon by examining all TASER deployments by police officers in a large metropolitan department during a 3-year period (2002 to 2004; $n = 243$). Findings indicate that the TASER was used almost exclusively against violent suspects classified as "emotionally disturbed" by emergency service officers with supervisors present. Despite use on a population perceived as being higher risk for injury, findings indicate that the TASER was effective, as 85% of suspects were incapacitated and taken into custody without further incident. The article concludes with a discussion of implications for continued use of the TASER and the need for additional research before any definitive conclusions about use and effectiveness of the weapon can be drawn.

Keywords: *TASER; less lethal force; use of force*

Police agencies have increasingly relied on the TASER to incapacitate combative or violent suspects who may be resistant to lesser degrees of force. Despite their adoption by more than 8,000 law enforcement agencies in the United States, there is little empirical research examining the use of these stun guns by police officers. Like many other innovations in policing, researchers have failed to keep pace with the diffusion of this rapidly spreading technology. Another indication of growth of TASERs in policing are the economic trends; the company's revenue has grown from approximately $2.5 million for fiscal year 1999 to an estimated $67 million in 2004 (McBride & Tedder, 2005). There are competitors to TASER, including Stinger Systems and Law Enforcement Associates, but TASER dominates the market, with approximately 95% of stun device sales in the United States.[1]

Although these figures suggest that TASERs are becoming commonplace in law enforcement, there are numerous unanswered questions regarding its use and effectiveness, as well as its potential to contribute to serious injury or death, particularly when used against the mentally ill, those under the influence of drugs or alcohol, and those

with heart and respiratory conditions. Additionally, a number of contentious incidents highlighted in the news media in Miami, Chicago, and Minneapolis raise questions about the circumstances when it is appropriate to use the TASER (i.e., against minors and noncombative suspects). In response to these unanswered questions, Amnesty International (2004) issued a report on the TASER, calling for a moratorium on its use by police in the United States. The American Civil Liberties Union and the Southern Christian Leadership Conference have also expressed opposition to the use of stun guns in situations where there is not an immediate threat of harm or death to an officer, suspect, or citizen. Notwithstanding, advocates of the TASER contend that this technology has saved lives in situations where other less lethal methods are ineffective and lethal force may be justified and that their continued use is warranted.

This article seeks to investigate these critical issues by examining all incidents involving the use of the TASER by police officers in a large metropolitan department during a 3-year period (2002 to 2004; $N = 243$). Drawing from police reports of incidents in which an officer used the TASER, the article seeks to accomplish a number of objectives: (a) to describe the typical situations in which the weapon is used, (b) to examine the demographic and behavioral characteristics of police officers and suspects involved, (c) to assess the effectiveness of the device, and (d) to investigate whether it is used in compliance with departmental guidelines.

It is important to note that this article will not address questions regarding the potential for the TASER to contribute to serious injury or death. A number of existing studies have begun to address the health effects of the TASER (International Electrotechnical Commission, 1994; Joint Non-Lethal Weapons Human Effects Center of Excellence, 2005; McDonald, Stratbucker, Nerheim, & Brewer, 2005). Additionally, the National Institute of Justice is currently funding research to examine the physiological effects of the TASER, and these questions exceed the scope and purpose of this research. Rather, this study seeks to provide a descriptive investigation of one large metropolitan police agency's use of the TASER, focusing on basic questions about use, prevalence, and effectiveness.

Review of the Literature

Police and the Use of Force

Police officers have the legal authority to use force in various situations, such as when they seek to protect themselves and the public, make an arrest, overcome resistance, or gain control of a potentially dangerous situation (Walker & Katz, 2002). Research generally shows police use of force to be a rare event. Studies conducted by McLaughlin (1992) and the U.S. Bureau of Justice Statistics (1999) indicate that police used some form of force in 1% of all encounters with citizens. When verbal commands and handcuffing are defined as force, estimates increase considerably (Terrill, 2001; Terrill & Mastrofski, 2002). Although use of force estimates vary somewhat depending

on the data source (i.e., police records, observations, or surveys), research generally indicates that police use restraint and pain compliance methods more often than potentially lethal impact methods and that the use of firearms is a rare occurrence (Klinger, 1995; Pate & Fridell, 1993). Nonetheless, Bittner (1970) argues that the capacity to threaten or use physical force is a core function of the police:

> Whatever the substance of the task at hand, whether it involves protection against an undesired imposition, caring for those who cannot care for themselves, attempting to solve a crime, helping to save a life, abating a nuisance, or settling an explosive dispute, police intervention means above all making use of the capacity and authority to overpower resistance. (p. 40)

The option of resorting to force shapes the interactions between police and the public and influences the decisions that individuals make during these encounters. Because of the magnitude of this responsibility and its potential for abuse, police agencies typically provide officers with a "continuum of force" to guide officer decision making based on the amount of danger or resistance present during an encounter with a citizen. Ultimately, however, situations that the police are called to handle are often unpredictable, and officers are expected to use the level of force that is reasonably necessary to attain compliance or make an arrest.

The Development of Less Lethal Force Alternatives

Police departments first sought to expand their alternatives to lethal force in the 1920s. As chemical munitions became available for nonmilitary purposes, police agencies were a burgeoning market for teargas, which could be used to disperse potentially violent crowds during protests. Because teargas grenades were relatively safe and effective compared to guns and batons, police officials welcomed the development of a teargas pen-gun that could be used to subdue combative suspects. The pen-gun technology was eventually discontinued, however, because the device occasionally caused serious eyes injuries. In 1965, the President's Commission on Law Enforcement and the Administration of Justice made a number of criminal justice policy recommendations, including the advancement of nonlethal weapons as an alternative to deadly force for line officers. This led to the emergence of chemical mace as a widely used less lethal weapon from the 1960s to the early 1980s. Chemical mace was eventually replaced by pepper spray, which is more effective on intoxicated individuals and does not carry as high a risk of secondary contamination.

As researchers were developing alternative forms of chemical spray, a California-based company was experimenting with the use of electric pulses as a less lethal alternative for police officers. The TASER, an acronym for Thomas A. Swift Electric Rifle, "is a conducted energy weapon that fires a cartridge with two small probes that stay connected to the weapon by high-voltage, insulated wire" (Hess & Wrobeleski, 2003, p. 87). The M26 Advanced TASER and the TASER X26 introduced by TASER

International in 1999 and 2003, respectively, are the two most common "new generation" stun devices used by police agencies. Both devices discharge two darts to a distance of 21 feet, delivering a 50,000 volt shock during a 5-second cycle. Although the new models of the TASER have the capacity to inflict acute pain, the weapon is not designed simply as a pain compliance device but rather as a method of incapacitating the suspect through muscle contractions induced by the weapon. The electrical charge overrides the central nervous system, resulting in the loss of neuromuscular control, which gives the officer time to gain control of the suspect and apply handcuffs. The Bureau of Alcohol, Tobacco, Firearms and Explosives does not classify the TASER as a firearm because the propellant is compressed nitrogen gas rather than gunpowder. As a result, there are no federal restrictions or guidelines for the use of the stun device.

Thirty-seven states currently do not place legal restrictions on the use of stun guns for public or private use (McBride & Tedder, 2005). In June 2004, Amnesty International reported that more than 700 police departments have purchased the TASER for every frontline officer on duty. As adoption of this technology becomes widespread, serious questions have emerged regarding when it should be used, its degree of effectiveness, and its potential to lead to serious injury.

The Critical Questions Regarding the TASER

Questions about when TASER should be used. Several questions are important for determining how the TASER is currently applied on the force continuum: (a) When is it appropriate (i.e., reasonably necessary) to use the TASER according to police agencies and individual officers? and (b) To what extent is the TASER used as an alternative to lethal force (in situations where lethal force is justified) and as an alternative to other less lethal weapons? It is not yet possible to answer the second question because police departments have just begun to accumulate detailed records on the circumstances relating to TASER deployments. News reports and police use of force policies may provide the answer to the first question. The following news reports of TASER incidents have appeared in *The New York Times* ("Claims Over TASERs' Safety Are Challenged," 2004):

- An unemployed man held his disabled grandmother hostage for 7 hours in a Bronx apartment, firing approximately 100 shots at the police through her apartment door before he was finally incapacitated by officers using TASER guns.
- In fall 2005, police officers in Miami used a TASER on a 6-year-old cutting himself with a piece of glass and a 12-year-old truant fleeing police.
- A 56-hr standoff with a suicidal man who was perched on a construction crane ended peacefully when police officers shocked him with a stun gun as he reached for a cup of water.

These news stories demonstrate that the police have used the TASER in varying situations to achieve different objectives. Although advocates believe the versatility of the TASER is beneficial, opponents have criticized its overuse. There appears to

be no consensus on where police agencies place the TASER on the force continuum. A number of police officers have reported that pepper spray is a more unpleasant experience because the recovery time is almost an hour, whereas the recovery time for the TASER is a few minutes with no aftereffects (International Association of Chiefs of Police [IACP], 2005). Others argue that the TASER produces severe pain.

As individual officers have different assessments of the TASER, police agencies are also inconsistent in where they place stun guns on the force continuum. A U.S. Government Accountability Office (2005) report found that placement of the TASER on the force continuum varied considerably across agencies. The Sacramento Police Department allows for use of the TASER during harmful situations, such as when a suspect is combative. The Phoenix and San Jose Police Departments permit use of the TASER at a lower level of force, such as when a suspect is actively resisting arrest but not assaulting an officer. The Orange County Sheriff's Department reported allowing use of the TASER when a suspect is passively resisting the verbal commands of an officer. The IACP (2005) reported that a majority of police agencies place stun guns at the same level of the force continuum as pepper spray.

Curt Georing, senior deputy executive director of Amnesty International, recently stated, "The evidence suggests that far from being used to avoid lethal force, many police forces are using the TASER as a routine force option" ("Claims Over TASERs' Safety Are Challenged," 2004, p. C1). In response to public concern about the inappropriate use of stun guns, the IACP issued training guidelines for the deployment of these weapons. The Police Executive Research Forum (PERF) also issued a series of policy recommendations. Among other guidelines, it is recommended that stun guns should only be used against those who are actively resisting or exhibiting aggression, and they should generally not be used against pregnant women, young children, and visibly frail persons.

Questions about effectiveness. In 1991, four Los Angeles police officers were videotaped beating Rodney King, striking him more than 50 times with their batons. Although not captured on videotape, officers had also used a TASER on King, stunning him twice but failing to subdue him. More recently, in San Jose in September 2004, a police officer was forced to shoot and kill a combative suspect after the officer had already "tased" the suspect twice. Although these cases suggest that TASERs are not always effective, there is currently little empirical evidence concerning the effectiveness of the TASER. Exceptions are the field report analyses produced by TASER International and the in-house evaluations conducted by a number of police agencies, which are discussed below.

TASER International (2002) compared the effectiveness of the TASER and pepper spray by examining incidents in which officers used both weapons during a single police citizen encounter. The TASER was rated as effective 82.7% of the time, compared to a rate of 33.1% for pepper spray (TASER International, 2002). Similarly, the Seattle Police Department found that use of the TASER effectively resolved 85% of incidents involving the weapon (Seattle Police Department, 2002). The Los Angeles Sheriff's Department reported a 94% effectiveness rating for its stun guns,

as compared to other less lethal devices, such as batons and pepper spray, which generally have an 85% effectiveness rating. The Los Angeles Police Department also found that the TASER was associated with fewer injuries during police citizen encounters (Meyer & Greg, 1991, 1992). Important considerations and limitations associated with this research include small sampling frames and potentially competing interests among those who carried out these studies.

Questions about harm. The first federal evaluation of the health effects of stun guns was conducted in 1976 by the U.S. Consumer Product Safety Commission. More recently, a number of existing studies have begun to address the health effects of the TASER and other stun devices (International Electrotechnical Commission, 1994; Joint Non-Lethal Weapons Human Effects Center of Excellence, 2005; McDonald et al., 2005). Preliminary research on the effects of the TASER on human heart rhythm has confirmed earlier studies indicating the TASER does not cause ventricular fibrillation when used for short intervals on healthy adults. It should be noted that the existing experimental research has not yet evaluated the effects of the device on vulnerable or unhealthy populations. In terms of the physiological impact of the TASER, it has been found to cause complete electromuscular disruption between 52% and 74% of the time, depending on the distance to the target (Joint Non-Lethal Weapons Human Effects Center of Excellence, 2005).

Amnesty International (2004) reported that 74 individuals in the United States and Canada have died after being shocked by a TASER. Drug intoxication, preexisting heart conditions, and exposure to other forms of nonlethal police force were major contributing factors in most of these incidents. Coroners' reports found that the TASER directly contributed to death, along with the above-mentioned factors, in at least five cases. The *Minneapolis Star Tribune* had previously documented 105 cases nationwide in which a person died after being shocked with a TASER. In a recently completed study by the U.S. Air Force, scientists concluded that the TASER "may cause several unintended effects, albeit with low probabilities of occurrence" ("Claims Over TASERs' Safety Are Challenged," 2004, p. C1). TASER International argues, however, that its weapon has never been listed as a primary or direct cause of death (*Minneapolis Star Tribune*, 10/17/04). Nevertheless, some have questioned whether the TASER may pose an elevated risk to the mentally ill in crisis, those under the influence of drugs and alcohol, and those with pre-existing heart and respiratory ailments. Because of these lingering questions, Amnesty International has recommended that all police agencies suspend its use until further testing can be completed, and the U.S. Department of Justice has recently funded research at the University of Wisconsin and Wake Forest University to study the physiological effects and impact of the TASER.

Although beyond the scope of the current study, research on the health effects of the TASER should be examined in light of findings on prevalence and effectiveness. It is important to take into consideration the number of incidents in which the technology is used and the safety and effectiveness of alternative less lethal weapons. For example, studies suggest that a blow from a kinetic impact weapon can result in traumatic apnea

and cardiac dysrhythmia, possibly resulting in death (Heck, 2003). Considerations relating to the adoption and deployment of stun guns such as the TASER may benefit from examining the relative effects of nonlethal weapons available for use in comparable settings.

In sum, basic questions about the TASER remain unanswered because of the lack of independent empirical research studying the weapon and limited sampling and reporting data on the circumstances surrounding TASER usage. This study will begin to address these weaknesses by examining all incidents involving the use of the TASER by police officers in a large metropolitan police department during a 3-year period, focusing specifically on the context in which the weapon is used, whom it is used against, and its degree of effectiveness.

Method

The Study Site

The police department under study serves a large metropolitan urban center. The department has not issued the TASER to all rank-and-file officers. Rather, the TASER has been issued to the Emergency Service Unit (ESU) officers only (the equivalent of SWAT). Also, all officers who are promoted to the rank of sergeant (or above) are trained in its use and are authorized to carry it, and each precinct has at least one TASER that can be signed out by a supervisor. The *Patrol Guide* details the very specific circumstances in which it is appropriate for a supervisor or ESU officer to use a TASER:

> Patrol supervisors or uniformed members of the service assigned to the Emergency Services Unit may utilize a TASER electronic stun device or stun device to assist in restraining emotionally disturbed persons if necessary. The TASER/stun device may be used:
>
> a. To restrain an EDP [emotionally disturbed person] who is evincing behavior that might result in physical injury to himself or others, OR
>
> b. To restrain person(s) who, through the use of drugs, alcohol or other mind-altering substances, are evincing behavior that might result in physical injury to himself or others.
>
> Emergency Service Unit personnel will obtain the permission of the Emergency Service Unit Supervisor prior to utilizing a TASER/stun device, except in emergencies. (Study Police Department, 2000, p. 1)

As a result, the TASER can only be used in situations involving an EDP or person under the influence of drugs/alcohol who is posing a threat of physical injury, where either emergency service officers are deployed or a supervisor is present and has a TASER in his or her possession. The *Patrol Guide* (Study Police Department, 2000) also offers a definition of an *EDP*:[2]

> A person who appears to be mentally ill or temporarily deranged and is conducting himself in a manner which a police officer reasonably believes is likely to result in serious injury to himself or others. (p. 1)

In situations involving an EDP, officers are instructed to create and maintain a "zone of safety" of approximately 20 feet and call for ESU and a patrol supervisor, as well as an ambulance (Study Police Department, 2000). Officers are not to attempt to take an EDP into custody unless

- the EDP is unarmed, not violent, and is willing to leave voluntarily or
- the EDP's actions constitute an immediate threat of serious physical injury or death to himself or others (study Police Department, 2000).

Design and Data

This article examines all reported cases of the use of the TASER by department personnel for a 3-year period (2002 to 2004; $N = 243$). The data are taken from the "TASER/Stun Device" report, which must be completed each time an officer uses the weapon.[3] The report is a one-page form that captures a variety of information about the suspect, the officer, and the incident. Much of the form involves "checking boxes" from a range of options, with an additional narrative section where the officer is required to describe the incident in detail. Variables relevant to this study include suspect demographics, suspects' emotional and physical state, suspect behavior, weapons present, officer assignment, and characteristics of the TASER use (distance, effect, etc.)

Based on the form, the authors created a database in Statistical Package for the Social Sciences (SPSS) that records 38 different variables for each case. The data are officer based, so that if two officers use their TASERs on a suspect, two separate incidents are recorded. However, if one officer uses the TASER twice on the same suspect, the case is counted only once, although there is a variable to indicate multiple uses by the same officer.

Analysis

This article presents a descriptive analysis of the 243 TASER incidents using frequencies and cross-tabulations. A descriptive approach is employed because of the dearth of research involving the TASER and the resulting unanswered questions about its use, prevalence, and effectiveness. The article seeks to provide a basic framework for beginning to answer these important yet basic questions. The first part of the analysis follows the structure of the department's reporting form, categorizing the findings into suspect-, officer-, and incident-related sections. The second section seeks to address the effectiveness question. Specifically,

1. Are suspects incapacitated?
2. Are officers satisfied with the TASER?
3. Is its use within policy?

Limitations

There are a number of limitations in this article that warrant discussion. First, the study involves one police department that deploys the TASER in a very specific and controlled manner. According to TASER International, approximately 8,600 police departments have adopted the TASER as a nonlethal alternative, and the generalizeability of the findings here to those other departments remains unknown. Second, this study uses official police records as a primary data source, and the findings reflect the deploying police officer's account of the incident, although there is a supervisory review of each report. Third, the article involves a descriptive analysis only. Yet given the lack of research on the TASER, more sophisticated analysis may be unwarranted and premature.

Finally, this article does not address important questions surrounding the potentially life-threatening side effects of the TASER (see the Amnesty International, 2004, report). These issues exceed the scope of this article, which focuses specifically on the use, prevalence, and effectiveness questions. Obviously, the findings presented here must be placed in the context of subsequent research that examines the health-related questions. Nevertheless, the authors believe this research offers an important first step toward understanding use of the TASER by police by characterizing its use and effectiveness in one police department and by offering a launching point for asking more in-depth questions about the nonlethal weapon.

Results

Suspects

Table 1 illustrates suspect-related characteristics from the 243 TASER incidents, including demographic information, the suspect's emotional and physical state (exhibiting signs of mental illness or intoxication), the suspect's behavior, and whether he or she was armed with a weapon (and if so, with what).

Demographics. Suspects in the TASER incidents were primarily male (86.8%); just more than half were African American (51.1%), 19.6% were White, 27.2% Hispanic, and 2.1% were Asian or some other ethnic group. Suspects in the TASER incidents tended to be older, with a mean age of 35.6. Several incidents involving use of the TASER by officers in other police departments (Florida in particular) have received national attention because of the age of the suspect, either because he or she was a minor or was a senior citizen. Review of the cases in this study indicates that there were three TASER incidents involving persons under the age of 18 (ages 15, 16, and 17). In each case, the juvenile was armed with a weapon and was exhibiting violent behavior either toward himself or herself or the officer. Alternatively, there were six cases involving suspects age 60 or older (ages 60, 61, 65, 66, 69, and 70). In all six

Table 1
Characteristics of Suspects and Officers Involved in TASER Incidents, 2002 to 2004

Suspect Characteristics	Percentage	*n*
Gender		
Male	86.8	210
Female	13.2	32
Total	100.0	242
Race		
African American	51.1	120
White	19.6	46
Hispanic	27.2	64
Asian/Other	2.1	5
Total	100.0	214
Suspect emotionally disturbed		
No	5.3	13
Yes	94.7	230
Total	100.0	243
Suspect intoxicated		
No	86.0	203
Yes, drugs	7.6	18
Yes, alcohol	4.7	11
Yes, both	1.7	4
Total	100.0	236
Suspect armed		
No	59.5	135
Yes	40.5	92
Total	100.0	227
Suspect violent		
No	6.4	15
Yes, toward self	23.1	54
Yes, toward officer	45.3	106
Yes, toward others	4.3	10
Yes, multiple	20.9	49
Total	100.0	234
Officer characteristics		
Rank		
Patrol Officer	44.4	106
Detective	50.6	121
Supervisor	5.0	12
Total	100.0	239
Command		
Emergency service unit	93.2	206
Other	6.8	215
Total	100.0	221

(continued)

Table 1 (continued)

Suspect Characteristics	Percentage	*n*
Back-up present		
No	5.5	12
Yes	94.5	207
Total	100.0	219
Supervisor present		
No	10.6	24
Yes	89.4	203
Total	100.0	227

cases, the suspect was armed with a weapon, and in five of the six cases, the suspect was exhibiting violent behavior either toward himself or herself or the officer.

Suspect's emotional and physical state. Table 1 indicates that most of the suspects in the TASER incidents under study did not appear to be under the influence of drugs or alcohol (86%).[4] Of the 14% reported to be intoxicated, 7% were under the influence of drugs, 5% were under the influence of alcohol, and 2% were under the influence of both drugs and alcohol. Thus, it appears that the TASER is not used frequently by police in this department against suspects who are intoxicated.

However, Table 1 also shows that the vast majority of suspects involved in the study cases were considered EDPs.[5] Only 5% of suspects were not classified as emotionally disturbed. Although this would appear to suggest that police officers in the study department use the TASER disproportionately against the mentally ill in crisis, this finding must be interpreted in the context of how the department has deployed the TASER. Recall that rank-and-file officers do not have access to a TASER; only emergency service personnel and supervisors are authorized to use the weapon. In fact, Table 1 also shows that more than 90% of the officers who used the TASER were assigned to the ESU (see discussion below). Per department policy, the ESU is called when the patrol officers or supervisors on scene determine that the situation involves an EDP who is behaving in a manner that could result in physical injury or death to the EDP or others (Study Police Department, 2000). Thus, these data are a reflection of the types of suspects typically handled by the ESU—a highly specialized group of officers—not the suspects typically handled by line officers. Moreover, because we do not have data on all ESU cases (regardless of TASER use), it is unclear how often officers in the ESU use the TASER against emotionally disturbed suspects, compared to no weapons, alternative nonlethal weapons, and lethal force.

Suspect weapons. Table 1 shows that just less than half of the suspects were armed with a weapon (40%), whereas 60% were unarmed (this information was

missing in 17 cases). Of the 91 cases where the suspect was armed with a weapon, 67 involved a knife or cutting instrument (74% of armed suspects, 30% of all cases). There were also two cases where the suspect was armed with a gun: In one case, the suspect was threatening to commit suicide, and in the other case, the suspect had taken a hostage and was threatening multiple people (including the hostage and himself). Of the remaining cases involving an armed suspect, the most common weapon was a blunt object, such as a metal pipe, baseball bat, chair, or large stick.

Violent behavior. In addition to exhibiting signs of mental illness, the vast majority of suspects—94%—were engaging in violent behavior. This violent behavior was directed at a police officer(s) in nearly half of the cases (45%). Approximately one quarter of the cases involved a threat of suicide or self-harm (23%), 4% involved violence toward a third person (neither the suspect nor the officer), and 21% involved violence toward multiple people at the scene. As discussed earlier, much of the controversy surrounding the TASER has focused on when it should be used; specifically, is it appropriate to use the TASER against noncombative, unarmed suspects who simply fail to follow verbal instructions (i.e., passive resistance)? Quite clearly, the study police department avoids this controversy by limiting use of the TASER to suspects who are posing a violent (and often armed) threat to themselves, a police officer(s), or other citizens.

Officers

Unfortunately, the TASER/Stun Device reporting form captures very little information about the officer who deploys the weapon. Table 1 describes the rank of the deploying officer as well as his or her command assignment. Half of the officers were detectives (50.6%), and 44.4% were patrol officers. Just 5% were supervisors. As mentioned above, 93% of the officers were assigned to ESU.

In the vast majority of cases, the officer deploying the TASER was not alone. Back-up officers were present in nearly all of the cases (94.5%; this information was missing in 24 cases). Perhaps more important when considering appropriate use of the TASER, a supervisor was present in nearly 90% of the cases.[6] The nearly universal presence of back-up officers and supervisors is again dictated by the fact that most of these cases involve the ESU. This unit is typically called to the scene by the first responding officer, and oftentimes, a supervisor will also respond.

Incidents

Types of encounters. Table 2 shows a variety of incident-related characteristics that help illustrate the types of encounters in which the TASER is used. More than three

Table 2
Incident Characteristics of TASER Cases, 2002 to 2004

Incident Characteristics	*percentage*	*n*
Location		
Indoors	77.2	186
Outdoors	22.8	55
Total	100.0	241
Suspect arrested		
No	76.4	175
Yes	23.6	54
Total	100.0	229
Suspect transported to hospital		
No	5.1	12
Yes	94.9	223
Total	100.0	235
Number of TASER deployments		
One	79.3	184
More than one	20.7	48
Total	100.0	232
Mean distance between officer and suspect (in feet)	5.52	228
Contacts on target		
Both on target	91.1	185
One contact missed	5.4	11
Both contacts missed	2.5	5
Contacts hit but fell from clothing	1.0	2
Total	100.0	203
Was suspect incapacitated?		
No	15.3	33
Yes	84.7	183
Total	100.0	216
Mean time to incapacitation (in seconds)	8.23	
Did suspect continue resistance?		
No	68.6	157
Yes	31.4	72
Total	100.0	229
Officer satisfied with TASER?		
No	20.4	46
Yes	79.6	180
Total	100.0	226
Use within department policy		
No	0.0	0
Yes	84.4	205
Missing	15.6	38
Total	100.0	243

quarters of the cases occurred indoors; approximately 23% occurred outdoors. It is interesting that 35 cases occurred in a precinct house, usually in the jail cell area (14% of the 243 cases). In all of these stationhouse cases, the suspect was already in custody but was exhibiting violence toward himself or herself or others. As a result, the ESU was dispatched to resolve the situation. Table 2 also shows that the majority of suspects—76.4%—were not arrested after the incident. Approximately 12% were already arrested and in custody (mostly the stationhouse incidents described above), and an additional 12% were arrested as a result of the incident that led to the TASER deployment.[7]

One potential explanation for most of the suspects not being arrested likely stems from their mental illness. Although many argue that mental illness is being increasingly criminalized (Teplin, 2000), conventional wisdom currently suggests that diverting those suffering from mental illness out of the criminal justice system is the optimal approach (Lurigio, Fallon, & Dincin, 2000). As per department policy, the vast majority of suspects—95%—were transported to the hospital for a physical examination (with one quarter being arrested for criminal offenses). However, these data do not indicate how often the encounter led to a civil commitment or long-term hospitalization.

TASER deployment. The departmental reporting form also records information concerning the actual deployment of the TASER. Table 2 shows that the average distance between the suspect and the officer at the time of deployment is approximately 5½ feet. In more than half of the cases (57%), the officer and suspect were 5 feet or less from one another at the time of TASER deployment. In nearly 80% of the incidents, the TASER was only deployed once by the officer; the mean number of deployments is 1.46. In one fifth (21%) of the cases, the TASER was deployed multiple times, and in seven cases, it was deployed more than twice (3%). It is notable that in the 74 cases detailed in the Amnesty report, multiple discharges occurred in more than half of the cases (missing data in 28 cases). This may suggest a correlation between multiple discharges and increased risk of serious side effects, although more research is needed to test this possibility.

Table 2 shows that in more than 90% of the cases, both contacts hit the suspect as intended (information is missing in 40 cases). In 5%, one of the contacts missed, and in just less than 3% of cases, both contacts missed the suspect. Finally, in 22% of the cases, officers also used another nonlethal device, most typically a stun device (14%) or mace (5%).

The Effectiveness Question

Aside from characterizing the suspects and officers involved in TASER encounters, a central question addressed by this research involves whether the TASER achieved its primary objective: to successfully incapacitate a combative suspect without serious injury to the officer or suspect. Table 2 shows that 85% of suspects were subdued by the TASER and taken into custody. The mean time to incapacitation (from TASER

deployment) was 8.23 seconds; although, among those who were incapacitated, nearly three quarters (72%) were subdued in 5 seconds or less.[8]

In one third of the cases (31.4%), the suspect continued resistance against the officer after being struck by the TASER. These 72 cases can be broken down into two categories based on when the resistance occurred. In 33 cases, the resistance continued immediately following TASER deployment because the suspect was not incapacitated by the weapon. In the remaining 39 cases, the suspect was initially incapacitated by the TASER, the officer(s) gained control of him or her, but the suspect began resisting again at a subsequent point. Two important findings emerge from this distinction regarding continued resistance. First, because the objective behind using a TASER is to gain immediate control over a combative suspect, the 33 cases where this did not occur may be seen as representing the failure rate. As a proportion of the total number of cases, this represents a 14.4% failure rate (missing information for 14 cases), or alternatively, an 86% success rate. Second, the issue of continued resistance at a later point in the encounter highlights the fact that the TASER is intended to temporarily incapacitate a suspect; the involuntary loss of muscle control is not long term, and the suspect will regain full functioning in a relatively short period of time, typically within a few minutes.

Another measure of TASER effectiveness that is captured in these data involves officers' satisfaction with its performance. In 80% of the study cases, the TASER was deemed—by the officer—to have performed satisfactorily. It is not surprising that the 20% of cases where officers rated the TASER as performing poorly ($n = 46$) include all of the cases where the suspect was not immediately subdued.[9] Also, it is interesting to note that satisfaction rates vary considerably by officer rank and command. Satisfaction levels are quite high among police officers and detectives, the vast majority of whom are assigned to the ESU: 87% of police officers and 79% of detectives reported being satisfied with the TASER. However, among the 12 supervisors who used a TASER, only 5 (or 42%) reported being satisfied. The drop in satisfaction level may occur for supervisors because they carry a less effective model of the TASER than the ESU officers or because they are more likely to use the device improperly as a result of lack of training and infrequent use.

The TASER/Stun Device reporting form also includes a section for a department supervisor's assessment of whether the use conformed with departmental policy. In 84% of the cases, a supervisor signed off on the form and indicated that the use was consistent with departmental policy. In the remaining 16% of the cases ($n = 38$), the form was not signed, and there was no information about whether the use met departmental policy. However, a review of the narrative of those 38 cases suggests that they too conformed with department policy on use of the TASER.

Reducing the potential for a violent outcome. The primary objective of the TASER is to reduce the likelihood of serious injury or death to suspects and police officers. The analyses above have partially addressed this issue, but to more fully investigate the violence reduction question, we have created a preliminary violence

escalation scale and classified all incidents on that scale. The scale ranges from 0 (*least potential for a violent outcome*) to 9 (*highest potential for a violent outcome*) with points assigned as follows:

- Suspect weapon (up to 3 points):
- +3 for armed with a gun
- +3 for armed with a knife/cutting instrument; distance 20 feet or less from officer[10]
- +1 for armed with other weapon or knife/cutting instrument with distance of more than 20 feet
- +0 for unarmed
- Suspect violent behavior (2 points)
- +2 for violent behavior (toward officer, self, others, or multiple)
- +0 for not violent
- Under influence of drugs and/or alcohol (1 point)
- +1 for intoxicated (drugs, alcohol, or both)
- +0 for not intoxicated
- Mentally ill and in crisis (1 point)
- +1 for exhibiting signs of being mentally ill, in crisis
- +0 for not exhibiting signs of being mentally ill, in crisis
- Police officer alone (1 point)
- +1 for one officer (no back-up or supervisor present)
- +0 for multiple officers present
- Suspect weight (1 point)
- +1 for suspect weight more than 210 pounds
- +0 for suspect weight 210 pounds or less

The rationale for assigning violence escalation points for armed and violent suspects is straightforward. Points are added for intoxicated and mentally ill (in crisis) suspects because research shows that individuals in those mental and physical states are more likely to resort to violence (Mulvey & Fardella, 2000; Newhill & Mulvey, 2002; Swanson, Holzer, Ganju, & Jono, 1990). Also, if the officer is alone, there may be an increased likelihood that a suspect will actively resist. Finally, analysis showed that the mean weight of suspects who continued to resist after being struck with the TASER was nearly 20 pounds heavier than those who did not continue resistance (210 pounds and 192 pounds, respectively).

Table 3 illustrates how the cases were scored on the Violence Escalation Scale, ranging from values of 0 through 8.[11] These scores were then collapsed into a three-level escalation risk classification: 0 to 3 = low, 4 to 5 = medium, and 6 to 8 = high. Table 3 also shows the percentage of cases in each violence risk level: 37.5% were low risk, 36.5% were medium risk, and 26.0% were high risk. Within each risk level, we then examined officer satisfaction (a measure of TASER effectiveness): low risk = 77.3%, medium risk = 68.3%, and high risk = 89.1%. Although this is a rather rudimentary analysis with a preliminary scaling measure, this analysis, taken with earlier findings, suggests that the TASER performs satisfactorily in most cases, but its effectiveness

Table 3
Violence Escalation Scales

Violence Escalation Score	Percentage		*n*
0	0.5		1
1	2.1		4
2	5.2		10
3	29.7		57
4	28.1		54
5	8.3		16
6	17.7		34
7	7.8		15
8	0.5		1
Total	100.0		192
Risk of Violence Escalation	**Percentage Satisfactory Use**	**Percentage of Total**	***n***
Low (0 to 3)	77.3	37.5	72
Medium (4 to 5)	68.3	36.5	70
High (6 to 8)	89.1	26.0	50
Total	100.0	100.0	192

appears to be greatest (nearly 90%) in those situations where the potential for injury or death is highest.

This finding begs the question, why does the TASER appear to be most effective in the highest risk situations? Although this question cannot be answered definitively, we see three possible explanations. First, high-risk situations could be fundamentally different in ways that affect officer satisfaction (our effectiveness measure here). Second, the actual physiological effects of the TASER may be more effective in these encounters. Third, police officer performance during and after the TASER use may be different in high-risk encounters (i.e., quicker reaction times, better handcuffing, etc.). Additional research is needed to further investigate these relationships, although we suspect Options 1 and 3 are the most likely explanations.

A Brief Consideration of the Physiological Effects of the TASER

Although the issue of whether the TASER increases the likelihood of death among suspects is not the focus of this article, we broached this complex question by reviewing the archives of the major newspaper in the study city during 2002 to 2004. This review produced no evidence of death of a suspect after being struck with a TASER. Also, there is no indication in the police data used for this study that a suspect experienced serious injury or death following the incident. Although by no

means definitive, we are unable to find any evidence of a death occurring after use of the TASER in the 243 study cases.

Discussion

Using data from one major police department during a 3-year period, this article sought to characterize the use and effectiveness of the TASER through a descriptive analysis of 243 cases. The background and context for this article centers on a lack of independent empirical research on less lethal weapons in general and specifically for the TASER and the serious questions that have emerged as a result. The objectives of this article, although modest, represent one of the first empirical assessments of the TASER, specifically addressing a number of these serious questions. Given the limitations of the research stated earlier, the findings presented here are generally positive regarding the use and effectiveness of the TASER. Key findings include the following:

- Few suspects were under the influence of alcohol or drugs, but nearly all were classified as exhibiting signs of mental illness (95%)[12]
- Nearly all suspects were engaging in violent behavior (94%)
- Just less than half of suspects were armed, and among armed suspects, the majority had a knife or cutting instrument (30% of all cases)
- Nearly all police officers using the TASER were assigned to the ESU (equivalent of SWAT; 93%)
- Back-up officers and supervisors were present in nearly all cases
- A large majority of suspects were incapacitated by the TASER (85%), and most were incapacitated within 5 seconds
- Even though the suspects in these data are disproportionately from a vulnerable population that many argue are at higher risk for suffering serious physiological side effects, findings indicate the TASER was highly effective in these cases
- In one third of cases, suspect resistance continued after being struck with the TASER, but the resistance in the majority of these cases occurred at a later point in time – highlighting the temporary effect of the weapon
- In more than three quarters of the cases, the officer recorded that the TASER performed satisfactorily
- In a preliminary violence risk analysis, the TASER's effectiveness (i.e., officer satisfaction) was greatest in the highest risk situations
- Although our analysis was cursory, there is no evidence of serious injury or death occurring after being struck with a TASER

Implications

The positive findings presented here are largely a consequence of how the study department issues, monitors, and controls use of the weapon. Beyond the health risk issue, the controversy surrounding the TASER has focused on when it should be

used—where along the force continuum—how should it be used, and whom it should be used against. More specifically, some police departments have approved the use of the TASER in response to nonphysical resistance, such as not following verbal commands, in essence allowing officers to use the TASER in place of physically putting their hands on someone. Also, controversial cases making national news have involved TASER deployment against very young people (16 and younger), older suspects (60 or older), and the number of times the TASER is used (in some cases, as many as 10 times on one suspect). The study department has avoided many of these controversies through its limited use and control of the TASER.

There is little we can say about the health issue regarding TASER—other than we found no evidence to indicate a death—but the study department's policy of transporting all individuals struck with a TASER to the emergency room immediately after the incident seems prudent and may minimize the chance of a death occurring. However, the fact that the suspects in these cases were among those considered at risk for serious physiological consequences highlights the potential for proper training, supervision and policy to minimize inappropriate use, and possibly the risk of physical aftereffects.

Several police departments have heeded Amnesty International's call to stop using the TASER until more research becomes available, particularly with regard to the physiological consequences. For those departments that continue to make the TASER available to their officers, this article (and the study police department) would seem to offer a number of recommendations regarding its use, including the following:

- Ensuring that officers are properly and regularly trained in its use
- Requiring, whenever feasible, that a supervisor is present when a TASER is used
- Limiting use against minors and the elderly unless there is a significant likelihood of escalation of violence
- Limiting use to suspects who are physically combative and do not allow its use in response to passive resistance
- Requiring immediate transport of suspects to a hospital emergency room for a physical examination
- Adopting specific and tangible guidelines regarding the maximum number of times a TASER should be used on a suspect

These recommendations mirror similar guidelines recently released by both the PERF and the IACP.

Final Thoughts

Clearly, there is a need for more empirical research on the TASER. Many police departments keep data similar to those reported here, but it is generally not released to the public. Some departments have responded to requests by TASER International to file reports on their online database, but the company estimates that less than 10% of cases have been reported. As a result, we have no baseline data on how often the

TASER has been used, against whom, under what conditions, and with what result. This article takes a first step in that direction, but we will not have a complete, comprehensive understanding of the TASER until data for all (or most) of the departments using the weapon become available.

There are a number of ways to collect these data. One method involves a national reporting system where all departments would annually report their data. There have been calls for a similar database involving firearms discharges, but this reporting system has yet to come to fruition. Alternatively, the most practical and perhaps best way to start to capture the required data involves a national-level survey of all police departments using the TASER. TASER International certainly knows who its clientele is, and from this list, researchers could survey all—or a random sample—of departments about their use of the TASER in recent years. Once these data are collected from police departments, rates of saved lives and lost lives can be calculated by researchers. For example, consider the following:

- Rate of lives saved per 1,000 TASER uses = (# of situations de-escalated / total number of TASER uses) X 1,000
- Rate of lives lost per 1,000 TASER uses = (# of deaths after use / total number of TASER uses) X 1,000

This national-level survey offers the best chance for answering questions about prevalence, policies governing when it can be used and against whom, and the degree to which it poses a risk of serious injury or death. Simply put, these data on number of uses represent the denominator in the equation to calculate lives saved and lives lost, and although Amnesty International has documented lives lost following TASER use (without establishing a causal link), we have no estimates of lives saved (the numerator in the first equation). These very important rates cannot be calculated until we have these numbers, and without these rates, any conclusions drawn about the use and effectiveness of the TASER—and its physiological aftereffects—are necessarily premature.

Notes

1. Stinger Systems has sold just 12,000 stun devices since 2000. Law Enforcement Associates introduced their stun gun only recently, in March 2005.

2. This is the term used by the study police department.

3. These reports were provided to the authors by the supervisor of the department's training division. Although the form is used primarily for the TASER, there were 33 forms involving use of another type of nonlethal weapon, either a stun device or other similar alternative. Because the focus of this article is the TASER, these cases were excluded from the analysis.

4. This variable is based on the police officer's assessment of the suspect at the time of the incident. It is not based on more definitive tests, such as a urinalysis or blood/hair analysis.

5. This is also the officer's assessment based on available evidence.

6. In fact, there were only six cases (less than 3%) where the officer was alone when deploying the TASER (no back-up and no supervisor present).

7. A review of charges indicates that among those arrested (52 suspects), one third was charged with a serious person offense, such as assault, robbery, and attempted murder. An additional 14% of arrestees were charged with weapons-related and menacing offenses.

8. The median time to incapacitation is 5.0 seconds, indicating that the mean is skewed a bit by a small number of cases with excessive times. There are five cases with the following times to incapacitation: 60 seconds ($n = 2$), 90 seconds ($n = 2$), 180 seconds ($n = 1$).

9. These cases are also marked by failure of the contacts to penetrate the skin (43%) and continued resistance by the suspect (88%).

10. Cases where the suspect is armed with a knife and is 20 feet or less from the officer are assigned 3 points because police are trained that suspects can "close the gap" from that distance before the officer can un-holster and draw his or her gun. Generally speaking, deadly force is permitted under such conditions.

11. Note that scores were not calculated for 51 cases because information on at least one of the variables was missing (i.e., to be scored, the case must have valid information on all scoring variables).

12. Again, these are not clinical judgments. Rather, they are conclusions drawn by the officers on scene based on available evidence.

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