

## **To shoot or not to shoot: Response and interpretation of response to armed assailants**

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In recent research, we found that eyewitness memory and interpretation of crime scenes were less effective than anticipated. However, conditions that enhanced the feature-intensive processing of crime scenes tended to facilitate or improve both memory and interpretation. In the present study, abilities to evaluate potential hazard and appropriate police response to armed assailants were addressed under idealized laboratory conditions. Using methods established in previous work, and in consultation with experienced police field training officers, we developed scenes of situations involving armed assailants confronting victims. Using these scenes, it was shown that the majority, of civilian respondents demonstrated very low capacity for distinguishing weapons from innocuous objects in context, even under ideal viewing conditions. However, respondents were in general personally willing to fire on what appeared to be an armed perpetrator, even if that “perpetrator” held a power tool rather than an actual weapon. In contrast, the vast majority of respondents was unwilling to accept a shooting response to the same situations on the part of police, even when the situations in question were rated by experienced police officers as absolutely requiring a shooting response to prevent loss of life. Results are considered in terms of the Gestalt/Feature-Intensive processing theory of cognition, and in terms of the ramifications of these findings for jury and public perceptions of officer involved shootings.

[Illustration Omitted]

When a police officer confronts an armed suspect, the officer’s choice of response must be made swiftly. Frequently, such decisions must be made in less than a second. During that time, many factors in the scene must be evaluated: the suspect’s motions; where the weapon is aimed; the presence of other people, including other potential suspects, and whether or not they are in the officer’s probable field of fire; and other potential sources of hazard, to self, to others, and to the suspect, in the immediate environment (e.g., Gelles, 2006; Montejano, 2004; Tietjen, 2004;

Moore, 2006). This type of rapid cognitive processing is frequently required of law enforcement officers under conditions of darkness or semidarkness. In addition, as is also the case in eyewitness identification situations, a given suspect's weapon may be occluded or partially occluded by suspect clothing, posture, or structures behind which the suspect may have taken cover (e.g., Narby, Cutler, & Penrod, 1996; Sharps, Barber, Stahl, & Villegas, 2003). All of these factors contribute to the difficulty inherent in the rapid and pervasive cognitive processing involved.

In view of these extensive processing demands, errors in perception or cognitive processing are likely to be relatively frequent. In situations involving deadly force, such errors may of course result in tragedy.

[Illustrations Omitted]

A classic case of this type occurred in 1999 in New York City, when Amadou Diallo was shot and killed by New York City police officers (e.g., Gladwell, 2005). It must be noted that Diallo's behavior was not typical for the innocent person, which he in fact proved to be. When challenged by plainclothes police, he ran. He was unresponsive to police commands, possibly because of language issues. During his flight from the police, Diallo attempted to escape through a door, and he apparently became increasingly agitated while attempting to open it. He began to dig in his pockets while turning his body away from the officers. Ultimately he drew what appeared to be a black object from a pocket, which he raised in the direction of the officers. At least one officer perceived the top of this object as the slide of a semi-automatic pistol. The officers fired, with lethal effect. The object, as has been extensively publicized ever since (e.g., Lee, 2005), turned out to be a wallet.

This type of event, in which officers mistake a non-lethal object for a firearm, is not common in terms of occurrence per police contact, but the effect does exist and has been extensively reported. Recently, a man in Tacoma, Washington, was shot and killed by police officers when he pointed a "small black cordless drill" directly at the officers after threatening to shoot them (Associated Press, 2007). In Central California alone, the authors are aware of a number of such instances involving a toy rocket, pellet guns, and--for perhaps incomprehensible reasons--a suspect who pointed a shoe at an officer from a position of cover behind a bed. Many other instances might be cited, although it is not the purpose of the present article to present a catalog of such errors--there are, quite simply, a fairly large number of cases in which various relatively innocuous objects have been mistaken for firearms.

As noted above, extraordinary demands are placed on the cognitive and perceptual abilities of police officers in cases of gun violence. Public perception of these incidents, however, typically does not center on the cognitive or perceptual issues involved. In the prototypical case cited above, Diallo, presumably because of language issues, disobeyed police commands. Presumably also because of fear and emotional arousal, he ran from police and made motions similar to those that a bona fide suspect would make in drawing a weapon. All of this occurred quickly and under very limited viewing conditions from the standpoint of officers. However, the officers' error in shooting him was attributed, in many sources, to racism (see Gladwell, 2005, for extended discussion).

Accusations of racism and of failures of integrity are frequently made in such cases, explicitly or implicitly. In a recent example, the authors observed a number of ad hominem attacks, in local media and “on the street,” on the officers involved in the pellet gun case mentioned above; it seemed incomprehensible, to many people, that officers could possibly mistake a pellet gun for a real firearm in the dark. Yet, a pellet gun is specifically engineered to resemble a handgun. Various media and Web-based sources publish what amount to databases on police shootings, including those made under circumstances such as those cited above (e.g., Lee, 2005). The Diallo case even inspired a famous singer to write and perform a popular song (Gladwell, 2005).

Frequently, however, this media and popular attention has little or no basis in fact; while, as Gladwell points out, the Diallo case was not “exactly exemplary police work” (p. 197), “there was no evidence that the four officers in the Diallo case were bad people, or racists, or out to get Diallo” (p. 197).

For these reasons, it is suggested here that popular perception of these mistaken-object effects, at least in many cases, may have more to do with highly unrealistic public and mass-media expectations, and with popular ideas about deadly force, than with putative racism or integrity issues on the part of police. To mistake a black square object in the dark, such the top of a wallet, for the slide of a semi-automatic pistol, or to mistake a near-perfect, full-size pellet-firing facsimile of a firearm for the real thing, does not necessarily impugn the character of a given officer in question.

These considerations motivated the present experiments, reported below. It has been shown that, in context, people tend to identify non-weapons as weapons with a fair degree of regularity. Does this also influence their actions? The standardized stimulus materials described briefly above, depicting realistic crime situations in static format, allowed us to address a question of significant potential importance for the weighing of evidence, in courtroom and investigative situations, concerning police shootings: What would the average citizen do in an officer’s place, if faced with a similar situation? In other words, does the average person, faced with the question of whether an armed perpetrator should be fired upon, integrate the necessary feature-intensive information about the weapon or non-weapon in context to arrive at an accurate decision?

Also, regardless of what the average person would do when faced with an armed assailant, what do we typically expect the police to do in the same life-or-death situations?

The present experiments addressed these questions.

## **Experiment 1**

The intent of this experiment was to address the question of how untrained people would react, themselves, if placed in the position of police officers confronting a situation potentially involving firearms and firearm violence.

**Participants.** The participants in this study were recruited from the Psychology Department Subject Pool of the California State University in Fresno, California. Eighty-seven women (mean age 19.36, SD = 1.31) and 38 men (mean age 20.16, SD = 1.68) provided usable data,

participating for college credit. The population was reflective of the multiracial makeup of the region, and all respondents were shown to be able to resolve visual stimuli (standard letters from the Snellen test of visual acuity) far smaller than the actual objects to be resolved. Gender proportions reflected those of the subject pool population. This pool, which has a relatively high attrition rate in their first year of college, may reasonably be generalized to the population at large, although these college-aged individuals are of course generally young and in good health.

**Materials.** As in our previous research (Sharps et al., 2006 and in press), this study employed high-quality digital photographs of ecologically valid crime scenes, developed with the advice and supervision of expert police field training officers. All officer advisors were highly experienced in tactical realities and in the sorts of situations encountered by witnesses and officers on the street. The photographs depicted a potentially violent crime scene, in which a male Caucasian perpetrator appeared, armed with a Beretta 9 mm handgun. Four scenes were employed. The first scene was a “simple” one, sparse in terms of potentially distracting objects. The second was “complex,” including street clutter, garbage cans, and other potentially distracting items. The third scene included several bystanders and a young, female “victim” threatened by the armed perpetrator, as well as the typical street clutter of Scene 2.

[Illustrations Omitted]

An additional fourth scene was generated, identical to Scene 3 except in one respect. In Scene 4, the weapon was replaced with a power screwdriver, as in our earlier work in the eyewitness realm (e.g., Sharps et al., 2006 and in press). This manipulation has recently assumed specific significance in the wake of the Tacoma shooting referenced above.

Thus, in the first three pictures, the “perpetrator” was seen to be holding a handgun or pointing it at a “victim.” In the fourth, the “perpetrator” was an unarmed person holding a power screwdriver, or perhaps waving the tool for emphasis in a non-lethal discussion or argument with the “victim.” The conditions for all four scenes involved uniformly excellent lighting (strong sunlight), and the relative comfort of witnesses being seated, 10-20 feet from a standard white movie screen, which they faced and on which the given scene was projected.

There was no movement or occlusion of important elements of the scenes, and of course there was no personal danger for the respondents in the experiment. As in our previous work, these idealized conditions were selected with the knowledge that an actual criminal situation, evolving quickly in uncertain lighting and potentially occluded conditions, will typically result in poorer performance given the known dynamics of human visual cognition (e.g., Narby, Cutler, & Penrod, 1996; Spoehr & Lehmkuhle, 1982).

**Procedure.** Each respondent viewed only one of the four scenes described above. Respondents were given the following instructions: “On the screen, you will see a scene or a series of scenes which may or may not involve a crime or sources of danger. These scenes will be shown very briefly. A person holding a weapon is a source of danger, because he or she could point it at you and shoot. You may intervene to protect yourself or others if you see an individual holding a weapon. You demonstrate your decision to intervene by shooting at the perpetrator holding the weapon (pressing the button). If you decide to shoot (or press the button), you must do so quickly before the scene is gone.” (Note: The “shooting at the perpetrator” instruction was given

for the “dart gun” condition described below; the “button” instruction was given for the Lafayette response apparatus condition, also described below.)

Based on police advice and on information provided in training for police psychologists and for United States Marshals (e.g., Montejano, 2004; Moore, 2006; Tietjen, 2004), respondents saw the scene for a period of either 2 s or 1/2 s, times that effectively bracketed the actual response time that would be available to a police officer encountering this situation.

Half the respondents were given the instruction to press a button on a Lafayette Instruments response apparatus if their decision was to fire on the “suspect.” The other half were asked to make this decision, if they deemed it necessary, by literally “firing” on the suspect, depicted on the screen, with a toy suction-cup dart gun. Obviously this latter manipulation was not intended to mimic the complex dynamics involved in firing a real weapon. Rather, we wished to provide preliminary information, for the sake of future research, on whether the simple act of raising a “weapon” into a simulacrum of a firing position, while attempting to aim at a target, might have an influence on the ability to ascertain the necessity of a shooting response.

## Results

To evaluate the effects of exposure time, shooting framework (dart gun versus button), and gender of respondent, a “combined shooting score” was computed across scenes. For each of the four scenes, a decision to shoot was rated as 2, whereas a decision not to shoot was rated as 1. It was shown that, overall, respondents were more likely to indicate a decision to shoot when pressing the button than when “firing” the dart gun,  $F(1,124) = 6.82, p = .01$ . The mean score across scenes for the button was 7.25 out of 8 possible, ( $SD = .98$ ); the mean score for the dart gun was 6.82 ( $SD = .88$ ). Neither the gender of the respondent, nor the exposure time (2 s versus 1/2 s), were significant influences on overall decision to shoot.

The pattern of results for the four scenes employed was consistent with the predictions of G/ FI theory (Sharps & Nunes, 2002; Sharps, 2003). The scene involving a lone perpetrator holding a gun, in a simple environment, with no victim, resulted in the smallest number of individuals deciding to shoot. However, even under these circumstances, in which no crime was depicted (the “perpetrator” as depicted in the “simple” scene could have as easily been target-shooting as committing a crime), 64% of respondents indicated the decision to fire. This result was significant ( $[\chi^2] [1] = 9.80, p = .002$ ).

In Scene 2, which depicted the same individual, alone and armed, but in an area with garbage cans, debris and typical street clutter, the proportion of those who decided to shoot rose slightly, to 67% ( $[\chi^2] [1] = 14.79, p < .001$ ). In Scene 3, when a “victim” and several bystanders were added to this condition, and the perpetrator was seen to be holding a pistol, the proportion of “shooters” rose significantly, to 88% ( $[\chi^2] [1] = 72.20, p < .001$ ).

Finally, the victim condition was repeated, except that the perpetrator held the power screwdriver, rather than the gun. The proportion of respondents who decided to shoot him was 84.8% ( $[\chi^2] [1] = 60.55, p < .001$ ).

The effect of scene on shooting score was significant,  $F(3,122) = 10.53, p < .001$ . Predetermined paired t-tests ( $p = .05$ ; experiment-wise error rate/capitalization on chance = 14.26%) indicated that both scenes with the victim produced higher proportions of “shooters” than did those without, but that there was no significant difference between the screwdriver and gun conditions when the “victim” was present ( $p < .05$ ). In other words, respondents were equally likely to shoot the perpetrator whether he was armed or unarmed, as long as there was a potential “victim” in the scene. It made no difference whether the perpetrator held a gun or a power tool.

## Discussion

The small but significant difference between the dart gun and timer conditions may have resulted from a disinclination to shoot when actual targeting behavior, even involving a toy gun, was required. However, it could also have resulted from a higher degree of active attention, and concomitant processing of the scene, in the dart-gun situation. This would be predicted to result in a heightened level of feature-intensive processing, which would in turn be expected to enhance general cognitive processing of the scene (Sharps, 2003). Further research will be needed to clarify this finding and to select between theoretical alternatives.

[Illustration Omitted]

Several important points may be derived from these results. First of all, when untrained people (the same people who are, of course, eligible for jury duty) “confronted” a suspect, the majority decided to shoot him under all conditions employed. A slightly larger number decided to do so when they had the opportunity to be distracted by other objects in their visual fields, such as street clutter and garbage cans, than when such objects were not present. However, when a “victim” was also depicted, and the “perpetrator” held a gun, the number of these individuals who decided to shoot rose to an overwhelming majority; 88%, nearly 9 out of 10, made this decision.

When the “suspect” held a power tool rather than a gun, approximately 85% elected to shoot this unarmed individual. The difference between the gun and screwdriver conditions was not significant. It should be noted that the situation in which most people effectively decided to kill an unarmed suspect was similar to the circumstances surrounding the Diallo case and the recent Tacoma incident, with the potentially important exceptions of different body postures and orientation of the mistaken objects involved, and the exception that the present results were obtained under ideal visual circumstances: involving static stimuli, free of occlusion, in excellent lighting, and with no personal risk. We would venture to suggest that these very high numbers of those who decided to shoot the unarmed suspect under ideal conditions might be inflated even further under the rapidly changing and visually confusing circumstances of a typical police emergency.

[Illustration Omitted]

There are, of course, limitations and exceptions to these results. In the “complex” scenes, the gun or power tool was held, in a one-handed grip, at an orientation that pointed it in the direction of the victim. As pointed out by reviewers of an earlier version of this paper, this very posture may have conveyed menace, which may in turn have contributed to respondents’ decisions to “shoot.”

It is of course true that in some cases (e.g., the Tacoma case cited above), innocuous objects really are pointed directly at officers or potential civilian victims (note that this was not the case in the Diallo tragedy). However, a less “menacing” posture, involving a less direct orientation of the object toward a potential “victim,” might reduce the shooting tendencies observed. On the other hand, any other posture would have placed both the gun and the power tool in a non-profile view, reducing the level of feature-intensive visual information available to the observer and thus, perhaps, resulting in even greater confusion of innocuous objects with weapons. It should also be noted that it would be difficult to ascertain at what point in orientation a given object comes to be viewed as sufficiently menacing to increase the decision to fire on the part of an observer. However, this important point concerning weapon/object orientation should absolutely be addressed parametrically in future studies, employing different objects, held at different orientations and viewed from different perspectives.

The instructions for this experiment, quoted above, informed respondents that they would see a situation in which a weapon might or might not be present. Cognitive framing is of course critically important for perception (see Bartlett, 1932; Ahlberg & Sharps, 2002). The intent here was to simulate, as far as possible, the minimum level of information that might be held by a law enforcement officer answering a call. However, as pointed out by a reviewer, this study did not address what might happen if a respondent were to encounter this situation unexpectedly, with no knowledge that he or she might be about to view a crime, or that a weapon might be present. Such a situation might very well precipitate a different result, and again should be addressed in future research.

In addition, also as pointed out by a reviewer of an earlier version of this paper, individual differences in such factors as temperament, tendencies toward impulsive aggressivity versus deliberation, and racial attitudes might very well be expected to influence these results. None of these factors were, of course, topics of the present study, but it should be emphasized that the present results should not be construed as reflecting universal human tendencies. Once again, these are important topics for future research.

Finally, of course, it is essential to emphasize that the present results do not excuse or condone the shooting of innocent persons under any circumstances, let alone under circumstances in which police integrity issues or other biasing conditions actually exist. The most important point of the present research is simply this: under excellent conditions of visibility, a randomly-selected population of young adults observed a person holding either a gun or a power tool in the same position and orientation. Between 64% and 88% of the respondents indicated a decision to fire on this person. They were most likely to make this response if the object in question was pointed at another person. When this was the case, it made no statistical difference whether the object in question was a gun or a power screwdriver. These results indicate an important potential source of cognitive confusion in weapon/object discrimination, and further suggest the need for evidence-based law-enforcement training to address this issue directly in practical field applications.

## **Experiment 2**

The intent of this experiment was to address the second question posed above: to determine how untrained people felt that a police officer should respond to a given situation involving gun violence.

**Participants.** The participants in this study were 33 women (mean age 19.36 years, SD = 3.80) and 11 men (mean age = 20.72 years, SD = 2.28) recruited from freshman psychology classes at California State University, Fresno. These respondents participated in the development of our database established in recent work on eyewitness issues (Sharps et al., 2006 and 2007) and were drawn from the same population, with the same characteristics, as the respondents of Experiment 1. Gender proportions reflected those of the classes.

**Materials and procedures.** This work again employed the same types of high-quality digital photographs of ecologically valid crime scenes used in our previous work (Sharps et al., 2006 and 2007), developed with the advice and supervision of expert police field training officers, highly experienced in tactical realities and in the sorts of situations encountered by officers and witnesses on the street. These photographs depicted a potentially violent crime scene. In Experiment 1 above, only a male perpetrator was employed, for the sake of typicality for real-world crime scenes, which, of course, overwhelmingly involve male perpetrators. In Experiment 2, both genders of potential assailants were included, in order to ascertain whether gender would influence perceptions of proper police actions. Therefore, in this study, a male or female Caucasian perpetrator appeared, holding a Beretta 9 mm handgun in a one-handed grip, oriented toward a young, female “victim” amid typical street clutter.

Three senior field training officers and a senior police commander were asked to evaluate proper police reaction to these scenes. In all cases, there was no question in the officers’ minds that this situation, as depicted, absolutely required a shooting response for both the male and female perpetrator; according to these officers, any police officer encountering this situation must fire on the perpetrator, who is depicted as clearly threatening an unarmed person with a gun, in order to prevent the probable imminent death of the victim. All officers were in agreement on this issue.

In this experiment, we made use of an extended exposure time, a full 5 seconds. As noted above, law enforcement experts are generally in agreement that a firearm assault situation such as that depicted may result in a violent conclusion in literally less than a second (e.g., Montejano, 2004; Tietjen, 2004; Moore, 2006). Therefore, respondents had far more than typically ample observation and processing time in this study. The same ideal conditions of observation used in Experiment 1 were duplicated here. After viewing the scene, respondents were asked, as part of a realistic police interview designed with the aid of senior, experienced police field training officers, what a police officer should do on encountering the situation depicted. They were also asked the reasons for their responses to this question.

## **Results**

The results of this study indicated a strong preference, on the part of civilian observers, for the police to refrain from firing if confronted with this situation. Overall, 11.36% of respondents felt that a shooting response was called for, in a stimulus situation that was deliberately crafted to create an absolute necessity for a shooting response. Responses varied somewhat with both

gender of observer and gender of perpetrator, but the unexpectedly low numbers of respondents who suggested the need for a shooting response precluded formal statistical analysis. Specifically, however, no male respondent felt that a shooting response was justified with a female perpetrator, although 22.22% of male respondents felt that it was appropriate to shoot the male perpetrator. Women in this experiment were more likely to suggest the shooting of the female perpetrator (11.76%), but only 1 of 16 female respondents in the relevant condition (6.25%) was in favor of a shooting response with the male. We caution in the strongest terms against drawing any conclusions from these results with regard to gender, however; the percentages are sufficiently low that we might very well expect idiosyncratic responding to have influenced these results, and the percentages with reference to gender are presented solely for completeness and as a potential basis for future studies.

## **Discussion**

The results of this experiment indicate that approximately 9 out of 10 people, within the experimental framework employed, were of the opinion that an officer should not fire in this situation, although all of the senior police officers consulted stated that the situation depicted absolutely required a shooting response. This result may have important implications for situations in which 12-person juries must evaluate a given police shooting.

The reasons given by respondents for their views on this issue were varied and should be the subject of future studies. Some respondents felt that the daylight, public conditions of the situation would preclude the perpetrator's firing. Others concocted elaborate sets of rules of engagement, or conditions, under which the officer might fire (for example, if the suspect fired first [in which case, of course, the victim would probably already have been shot], or if the suspect had already committed murder, or if the officer had first attempted to "convince" the suspect to drop his or her weapon). Others literally invoked the need for clairvoyance on the part of the police, saying that an officer should not fire in this situation because the suspect "did not look like she wanted to kill." Several qualified their responses with the idea that if the police had to fire, they should shoot the perpetrator's leg or arm, because, in the case of one response, "a shot to the leg is relatively harmless, if he is trying to escape, which means he is most likely guilty." It is suggested that many of these unrealistic responses may have derived from confusion of media depictions of police work with the real thing on the part of the public. It is further suggested, however, that if these ideas and attitudes are as widespread as the results of this initial research effort suggest, there is substantial need for better education in the realities of crime and police work for the public from which, of course, all jurors are selected.

In this experiment, only 11.36% of individuals saw a shooting response as appropriate in a situation absolutely requiring one. This result may be of special interest for courtroom proceedings. In any given, randomly selected jury of 12 citizens, these results suggest that on average, one or at most two jurors out of 12 would be likely see an officer on trial in an officer-involved-shooting situation as justified in shooting a perpetrator, even under the clearest and most appropriate of circumstances. This extreme discrepancy between public perception and actual police policy and operations warrants further attention, both in future research and in the modern criminal justice system.

[Illustration Omitted]

## **Summary and Conclusions**

The results of these studies, taken together, reveal several crucial points:

1. Contrary to much popular opinion, average people exhibited extreme difficulty in distinguishing a handgun from an innocuous object such as a power tool.
2. This difficulty was observed even under ideal viewing conditions, far superior to those in actual crime situations.
3. Average people indicated an overwhelmingly strong tendency to shoot, or at least to decide to shoot, an armed perpetrator themselves if given the opportunity, and did so at the same levels even if the perpetrator was “armed” only with a power tool which was evidently readily mistaken for a weapon.
4. However, even though the vast majority of the civilian respondents indicated a readiness to shoot the perpetrator themselves, only about 1 person in 10 felt it would be appropriate for the police to do so under the same circumstances.

These results reveal a substantial disparity between the actions, attitudes, and beliefs of typical adults and the practical realities of police work in violent situations. It is suggested, as a matter for further research, that much of this disparity may lie in public perceptions garnered from popular media depictions of crime and police work, and probably from unrealistic expectations concerning the workings and capabilities of the human nervous system in terms of such processing tasks as distinguishing actual firearms from, for example, screwdrivers. A substantial body of future research will be needed to address the underlying mechanisms and the ramifications of the findings obtained in these initial studies. For the present, however, it is clear that these effects assume special significance for the real-world courtroom circumstances under which actual witnesses, jurors, and public constituencies consider and testify as to the actions of law enforcement personnel in application to real-world violent crime.

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## **Diallo shooting case**

Events in the fatal police shooting of Amadou Diallo:

- Feb. 4, 1999: Four white plainclothes New York City officers investigating a rape encounter Diallo, who is unarmed, in the Bronx; 41 shots fired; 19 hit Diallo, killing him
- March 30: Officers are indicted on charges of second-degree murder
- Dec. 16: Appeals court moves trial to Albany, N.Y.
- Feb. 1, 2000: Jury seated; forewoman and three others are black
- Feb. 22: Prosecution and defense rest cases
- Feb. 16: Grand jury begins hearing evidence
- Feb.-March: Protest marches in New York demanding officers be arrested; off-duty police rally in support of them
- Feb. 2: Trial opens
- Feb. 25: Jury acquits all four officers of all charges

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