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The Effects of Suspect Race and Situation Hazard on Police Officer Shooting Behavior

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Shooting incidents involving patrol officers are examined for the effect of suspect race and degree of hazard in the number of shots fired and hits made on suspects. Additional tests examine frequencies of shooting incidents among Blacks and Whites with respect to city population and various measures of police-citizen contact. Finally, fatalities are examined with respect to involvement in shooting and arrest rates. The results suggest an effect for degree of hazard; however, there was no evidence to suggest police bias against Blacks.

In any given instance, an officer may or may not use force in dealing with a suspect. If he chooses to use force, he may respond in a variety of ways, ranging from physical restraint or handcuffing to the use of a baton or firearm. The use of these various kinds of force by police officers in citizen encounters has been extensively investigated. The investigations are generally reported in one of four ways: (1) case studies, (2) observer reports of police-citizen encounters, (3) surveys of police officers and citizens, and (4) formal complaints to police agencies and civilian review boards. A brief review of some of the more important research will help lay the groundwork for the methods employed in the present study.

Among case studies, the U.S. Commission on Civil Rights (1965) and the National Council of Churches of Christ (1960) have been prominent in

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highlighting specific instances of alleged use of excessive force by police personnel. Naturally, these allegations of unprofessional conduct are cause for great concern among law enforcement officers. Perhaps more importantly, however, such reports tend to sensitize citizen groups to police behavior. Many of these groups have come to believe so strongly ". . . that their group is the victim of widespread police brutality, that (police brutality) has become a reality to them. . . " (National Center for Police and Community Relations, 1967.)

The case study method is, by its nature, somewhat limited in scope. That is, many studies ignore the total spectrum of police action by focusing only on the negative, alleged abuse. Because the reported behavior may not, in fact, be representative of typical officer behavior, the conclusions and implications of such case studies must be regarded with caution.

The most extensive analysis of observer reported police-citizen encounters was conducted by Reiss and his associates (Black & Reiss, 1967; Reiss, 1967, 1968, 1971). Observers reported officer behavior ranging from "businesslike or routinized" to "hostile and provocative." Reiss concludes that incidents involving the use of force by police personnel are reasonably infrequent and do not suggest racial bias. It is, however, important to recognize that as a research tool, observer reports have some serious drawbacks. For example, the reported behavior of an officer may have resulted from the presence of the observer and, therefore, may not be typical.

Campbell and Schuman (1969) used a survey method in an investigation of racial bias in the use of force during search and frisk procedures. These investigators report that 25% of the Blacks and 7% of the Whites stated that they had been searched or frisked without cause. Lohman and Misner (1967) report that in Philadelphia, non-Whites account for only 27% of the population, yet they initiate 63% of complaints against police. On the face of it, these two studies suggest that police treat Blacks and Whites differently.

While such surveys may accurately reflect community attitudes toward the police, the actual correspondence between citizen accounts and the facts remain uncertain–i.e., the citizen reporter may not be free from bias. Moreover, the ratios of 25 Blacks to 7 Whites frisked without cause, or 63 non-Whites to 27 Whites complaining about police procedures may, in fact, reflect unbiased rather than biased officer behavior. For example, if the ratio of contacts with non-Whites to those with Whites corresponds to the ratio of crime rates by race, then conclusions about racial bias might be premature.

Formal complaints of police misconduct represent another source of data used in the study of force by police officers. Chevigny (1969) studied complaints to bureaus established for that purpose by the New York Civil Liberties Union. He reported that any civilian defiance of authority, even the act of recording an officer's badge number, could provoke officer aggression.

Such conclusions must be tempered with an understanding of the data. It is difficult to imagine that an officer interviewed about allegations of abusing a citizen would not at least hint that "the suspect started it." The same kind of one-sided report could be expected from the citizen.

Even if problems of interpretation and bias among reporters could be resolved, a more serious problem remains in any investigation into the use of force by police officers. That is, the definition of the term "force" is itself problematic. The data upon which earlier investigators have based their conclusions are subject to a variety of interpretations. For example, what is "hostile and provocative" to one observer may appear "businesslike or routinized" to another. Or, the frequency and nature of complaints of physical abuse might vary with the reporter's frame of reference, which could in turn depend upon his own socio-economic background and a myriad of related variables. What is needed to study the use of force is a standardized and readily measureable kind of behavior which is forceful per se. The use of firearms by police personnel provides such a research tool. In terms of this activity, the use and non-use of extreme force may be accurately distinguished. Either shots were fired or they were not.

This study examines two aspects of the use of firearms by police personnel. First, officer responses to two situational cues are examined. The two situational cues studied are the hazard of the suspect encounter and the race of the suspect. If police officers accurately determine the degree of hazard in a suspect encounter, it is hypothesized that the number of shots fired by police officers will increase with the danger of the encounter, and that such behavior would indicate an appropriate officer response to the situation. Prejudiced officer behavior may be indicated by more shots fired at and hits made on black suspects than white suspects within situations of similar danger. For example, if it is shown that more shots are fired at unarmed Blacks than at unarmed Whites, one might reasonably conclude that biased behavior exists. On the other hand, if race proves unrelated to the number of shots fired and/or hits made, any claim of biased behavior in terms of the number of shots and of hits would be questionable.

Second, this study examines whether officers will tolerate more deviant behavior from white suspects than from black suspects before judging the encounter to require their maximal response. In other words, is there any bias evident in whether or not police fire at Blacks or Whites, or is there any evidence to suggest that officers fire at Blacks and Whites with different probabilities.

METHOD

The files of a major metropolitan police department were reviewed for data on shooting incidents which occurred from January 1, 1970 through October

31, 1972. Patrolmen were required by policy to file a report each time their weapon was discharged either accidentally or intentionally. For the purposes of this study, a shooting incident was defined as the discharge of a weapon by a radio patrolman in the presence of a suspect.

The number of shots fired at, and the number of hits scored on black and white suspects (police records did not distinguish between Whites and Browns) who were unarmed, armed, or armed and firing were obtained from the shooting reports and used to investigate the level of officer response during shooting incidents. These data were analyzed by means of a two-way analysis of variance model. Although the data are non-normal, the ANOVA model seems appropriate due to the reasonably large sample sizes (N = 263 for the number of shots fired; N = 121 for the number of hits scored) for which the sample means of non-normal distributions are nearly normally distributed.

The ANOVA model requires independent observations within cells. While it is possible that the same officer may have shot at suspects within any cell or across cells, statistical dependence does not appear evident. Previous research by Inn and Wheeler (1973) showed that these shooting data can be accurately approximated by a model which assumes independence and non-normality of incidents. In addition, the fact that an officer may have been involved in more than one shooting does not argue that involvement in a shooting at one time is related to involvement in a shooting at another time. Inn and Wheeler found zero-order correlations between numbers of shooting incidents during different time periods. Therefore, it appears that shooting incidents can be "explained" and analyzed as random (independent) occurrences.

The ANOVAs were performed separately on the number of shots fired by patrolmen and on the number of hits sustained by suspects because previous analyses had shown no correlation (r = .007) between the number of shots fired by officers and the number of hits sustained by suspects. That is, the frequency of suspect hits appears unrelated to the number of shots fired by police.

Further analyses were performed to examine the relationships between shooting frequencies, race, and frequency of contact. Inn and Wheeler showed that police shootings may be described by the Poisson process, where each officer has an equal probability of being involved in a shooting, and that one involvement does not affect the probability of subsequent involvement. By extension, the number of shootings involving black suspects (166) and the number of shootings involving white suspects (96) may each be considered one observation from a Poisson distribution of shootings at Blacks or Whites. That is, there is a Poisson distribution of shootings at Blacks with an estimated mean equal to 166, and a Poisson distribution of shootings at Whites with an estimated mean equal to 96. Brownlee (1960) presents a method involving the F-statistic for testing whether the means are in some

hypothetical ratio when the number of black shootings and white shootings are independent observations from two Poisson distributions.

There are two hypothetical ratios which may relate to the ratio of shootings at black suspects to those at white suspects. First, if shootings were equally probable among all citizens, the population ratio of Blacks to Whites would reflect the ratio of Black to White shooting incidents. A second possible explanation is that the ratio of shootings is related to the amount of contact officers have with Blacks as opposed to Whites. If officers are more frequently in contact with black citizens, then the number of shootings at black citizens might be greater. The method in Brownlee was used to test whether the actual ratio of Black to White shootings departs from either of these two possible explanations. The extent of police-citizen contact was variously measured by (1) the number of arrests for major crime categories, (2) the number of citizen complaints and commendations, and (3) the number of beats. The number of beats per area was considered a measure of contact as beat boundaries were drawn to distribute calls for police service equally among the beats. It should be cautioned that at least two of the contact ratios (arrests, and complaints and commendation) may be subject to some sampling error and may, therefore, violate one assumption of the *F*-test for testing Poisson ratios.

Finally, fatalities resulting from shootings were examined. A test of the mean of the binomial probability distribution was applied to test whether the proportion of Black to White fatalities reflects both the proportion of Blacks to Whites involved in shootings, and the proportion of Blacks to Whites arrested for major crime categories.

RESULTS

Table 1 presents the results of the analysis of variance for the number of shots fired at suspects. From Table 1, it is evident that the race of the suspect as well as the degree of hazard of the situation significantly affect the number of shots fired during shooting incidents. As the hazard of the situation increased, officers fired an increasing number of shots at both black and white suspects. (This is direct support for the notion that officers are able to perceive the danger of the situation and respond appropriately.) Officers fired approximately 2.0 shots at unarmed suspects, 2.4 shots at armed suspects, and 3.3 shots at suspects who were armed and firing at officers. A Scheffé multiple comparison test was performed to determine if the number of shots fired for the three different levels of hazard differed significantly. It was found that officers fired significantly more shots ($p < .05$) at armed and firing suspects than at unarmed suspects. No significant difference was found between the number of shots fired at unarmed and armed or between armed

TABLE 1

MARGINAL MEANS AND RESULTS OF ANALYSES OF VARIANCE OF NUMBER OF SHOTS FIRED BY POLICE AND NUMBER OF HITS SUSTAINED BY SUSPECTS

	Marginal means				
	Suspects				
	Blacks	Whites	Unarmed	Armed	Armed and firing
Shots fired	2.014	2.917	2.013	2.375	3.267
Hits sustained	1.368	1.887	1.500	2.000	1.684

	Analysis of Variance Results						
	F-Ratios for Effects*						
Dependent variable	MS_w	Race ($df = 1$)		Hazard ($df = 2$)		Interaction ($df = 2$)	
		F	*p*	*F*	*p*	*F*	*p*
Shots fired (police)	3.60 ($df = 235$)	5.43	<.025	7.38	<.001	.44	>.50
Hits sustained (suspects)	1.04 ($df = 115$)	7.12	<.01	.91	>.50	.54	>.50

*MSs for effects are reproducible by F (for the effect) $\times MS_w$.

and armed and firing suspects. Officers also fired more shots at white suspects (2.9) than at black suspects (2.0). It is important to note that the analysis of variance reveals no significant interaction between race and level of hazard; officers tend to respond uniformly to differing levels of situation hazard and race. That is, the trend of officer behavior is similar for both races. However, as noted, the degree of response is different for races: More shots per incident are fired at white suspects.

Table 1 also presents the results of the analysis of variance for the number of hits scored by police officers with reference to both race of the suspect and level of hazard of the shooting incident. It is evident that across all three levels of hazard to police, officers scored more hits at white suspects than at black suspects. On the other hand, the degree of situation hazard does not significantly affect the number of hits scored by officers.

Table 2 presents four *F*-ratios testing the hypotheses that shootings occur in proportion to population, arrest, and citizen contact ratios. First, it is evident that the ratio of shootings at Blacks to shootings at Whites departs significantly from the city population ratio of Blacks to Whites. Thus, it appears that black citizens are involved in shooting incidents with disproportionate frequency based on their representation in the city population. The second *F*-test fails to distinguish between the ratio of shootings at Blacks to shootings at Whites and the ratio of Blacks to Whites arrested for major crimes. These crime figures include the total arrests of Blacks and Whites (reported to the FBI during 1972) on charges of murder, manslaughter, rape, robbery, aggravated assault, auto theft, and burglary. The third and fourth *F*-tests examine the ratio of the number of shootings in one half of the city (area A) to the number of shootings in the other half of the city (area B). The third test fails to distinguish between the shooting ratio and the ratio of complaints and commendations filed against or on behalf of police patrolling area A to those concerning police patrolling area B. The fourth test is marginally significant and suggests that the shooting ratio may differ from the ratio of contacts in area A to those in area B, when contact is measured by the number of beats in each area. This last test suggests that there may be more shootings per beat occurring in area B.

The final analyses concern the relationship between the proportion of black fatalities and the proportion of Blacks involved in shootings, as well as between the porportion of black fatalities and the proportion of Blacks arrested for the major crimes above. In both cases, the expected numbers of black fatalities (13.3 and 13.4) corresponds to the number of observed black fatalities (13), and a test for the binomial mean does not allow rejection of the null hypotheses. Thus, there appears to be no disproportionate number of fatalities among black citizens with respect to Blacks involved in shootings and Blacks arrested for these major crimes.

TABLE 2

CORRESPONDENCE OF SHOOTING RATIOS WITH SOME HYPOTHETICAL RATIOS

Shooting ratio	Hypothetical ratio	F-ratio	df_{num}	df_{den}	p
$\frac{\text{Black shootings}}{\text{White shootings}} = \frac{166}{96}$	$\frac{\text{Black population}}{\text{White population}} = .334$	5.210	192	334	$<.001$
$\frac{\text{Black shootings}}{\text{White shootings}} = \frac{166}{96}$	$\frac{\text{Black arrests}}{\text{White arrests}} = 1.505$	1.156	192	334	$\simeq.250$
$\frac{\text{Area A shootings}}{\text{Area B shootings}} = \frac{108}{45}$	$\frac{\text{Area A complaints and commendations}}{\text{Area B complaints and commendations}} = 1.977$	1.225	90	218	$>.100$
$\frac{\text{Area A shootings}}{\text{Area B shootings}} = \frac{108}{45}$	$\frac{\text{Beats in Area A}}{\text{Beats in Area B}} = 1.795$	1.350	90	218	$\simeq.050$

It should be noted that these latter findings differ markedly from similar data collected in Philadelphia by Robin (1963), where 32 citizens were fatally shot by police during an 11-year period. Twenty-eight of those citizens were Blacks, a result difficult to reconcile with the fact that Blacks accounted for only 22% of that city's population and only 31% of all major crime arrests in that city.

CONCLUSIONS

These results suggest, first, that patrol officers measure the intensity of their response according to situational cues. Police fire more shots at suspects who are armed and firing than they do at unarmed suspects. Their shooting accuracy, however, remains unaffected by the situational hazard. These results also have some policy implications. Over the course of the 34 months surveyed, officers fired an average of 2.013 shots at unarmed suspects. There may be some question regarding whether the intensity of officer response is justified when directed against unarmed suspects.

Race of the suspect, as a situational cue, presents an unexpected result. Officers appear to fire more shots at, and score more hits against, white suspects than black suspects. This phenomenon requires further investigation both for its generality and possible causes. For example, encounters with black suspects may occur in more densely populated areas where the chance of injury to bystanders or of being observed may be greater. Other explanations might include white officers responding with some kind of reverse violence toward members of their own race whom they perceive as behaving inappropriately; or, perhaps, police behave more cautiously with Blacks because of departmental policy or public sentiment concerning treatment of Blacks.

Secondly, this research examined whether officers fire at Blacks and Whites with different probabilities. The population of the city in which the data were gathered was approximately 75% white and 25% black. During the 34 months considered, there were 166 (64.4%) shooting incidents involving black suspects and 96 (35.6%) incidents involving white suspects. In the context of the total population, it is immediately obvious that there are not proportionate numbers of shootings for Blacks and Whites. However, this does not necessarily imply racial bias on the part of the police. Differential shooting rates may result from a variety of reasons other than racism: (1) The police may be in contact with greater numbers of Blacks than Whites, (2) Blacks may commit more street crimes than Whites, (3) Blacks may attempt escape more often than Whites, (4) Blacks may resist arrest more often than Whites, etc.

This research was not designed to provide direct evidence regarding the correspondence between police-public contact and shootings. Some

conclusions, however, may be made. While shooting frequencies do not depart from the frequency of officer contact with the public as measured by the number of major crime arrests and the number of complaints and commendations filed, shooting frequencies do differ from contact rates as determined by the number of city beats. It must be emphasized that these data do not suggest any causal relationships between contact rates and shooting frequencies. It is, of course, not possible to affirm the null hypothesis in the statistical tests, and it is also possible that police bias may be reflected in both the number of citizen contacts as well as the number of shootings. For example, arrests as well as complaints and commendations as well as shooting incidents might occur in identical, biased ratios. That is, the analyses might reflect only the consistency of biased behavior as opposed to lack of bias in shooting situations.

In summary, there does not appear to be any overwhelming evidence of prejudiced officer behavior against Blacks involved in shooting incidents. There is even some evidence to the contrary: More bullets were fired at white suspects than at black suspects. The results also suggest a possible correspondence between citizen contact and shootings. To the extent that these speculations are accurate, there are important implications for the popular conception of optimal policing. Larger police forces relative to citizen populations may produce more frequent occurrences of the use of force by police. "More men on the street" may indeed provide greater opportunity for violent confrontation between the police and the public.

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