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United States General Accounting Office
Washington, DC 20548

June 13, 2003

The Honorable F. James Sensenbrenner
Chairman
Committee on the Judiciary
House of Representatives

Subject: *Technical Assessment of Zhao and Thurman's 2001 Evaluation of the Effects of COPS Grants on Crime*

Dear Mr. Chairman:

Community Oriented Policing Services (COPS) is a federal public safety program whose goals are to add officer positions to the streets of communities nationwide and to promote community policing. Since the program's inception in 1994, local law enforcement agencies have received billions of dollars in grants to hire additional officers, acquire technology and civilian personnel, and implement innovative crime-prevention programs. To receive COPS grants, agencies are expected to implement or enhance community policing strategies illustrating community partnerships, problem solving, and organizational commitment. Given the large expenditures of funds, it is important for policy makers, among others, to have sound information on the effectiveness of the COPS program in reducing crime. You asked us to review one evaluation of the effectiveness of the COPS program—by Zhao and Thurman[1]—and to render an assessment of its quality. In this report, we provide information on the extent to which this particular study's conclusions are supported by the data the researchers used and the analyses they conducted. GAO statisticians and methodology specialists reviewed the study using standard and widely accepted statistical and social science research principles.

Our assessment of Zhao and Thurman's work cannot be construed to be an assessment of the COPS program itself. Since we have not reviewed the quality of any other COPS evaluation or conducted an independent evaluation of the program, we have no basis to judge whether or not the program has been effective in achieving its stated goals. It is also important to note that these types of aggregate level analyses that are intended to assess program effectiveness are extremely difficult to execute successfully, in part, because direct measures of important variables are not always available.

[1]Zhao, J. and Thurman, Q. *A National Evaluation of the Effect of COPS Grants on Crime from 1994 to 1999* (Dec. 2001).

We conducted our review of Zhao and Thurman's study during a 3-week period in May 2003. In addition to reviewing Zhao and Thurman's December 2001 report, we reviewed a November 2002 journal article by Zhao, Scheider, and Thurman based on the same study,[2] reviewed a May 2003 draft of an updated COPS study by the same authors, and discussed data and statistical issues with these researchers in a telephone call on May 27. In this report, we focus the majority of our comments on Zhao et al.'s earlier COPS study (reported in December 2001 and November 2002). We discuss differences between the earlier study and the May 2003 follow-up study in a section at the end of this report. For ease of presentation, we refer to their original work as the "2001 study."

Background

The Public Safety Partnership and Community Policing Act of 1994[3] authorized $8.8 billion in grants to be awarded to law enforcement agencies for fiscal years 1995 to 2000. Focused on crime-prevention, the act required, among other things, that half the grants go to law enforcement agencies serving populations of 150,000 or less. The act also required that grantees not supplant state and local funding, but rather use the federal funds for additional law enforcement beyond what would have been available without a grant. The Attorney General created the Office of Community Oriented Policing Services to administer the grant programs and advance community policing across the country.

The COPS office is tasked with promoting community policing through a variety of types of grants, including:

- Hiring grants, which are used to fund the hiring of additional police officers. Through its Universal Hiring Program, the COPS program provides funding directly to local, state, and tribal jurisdictions. The funding provides up to 75 percent of the salaries and benefits for new officers for 3 years up to a maximum of $75,000 per officer. According to the COPS Office, 71,192 officers were funded and 63,592 officers were hired through hiring grants as of July 26, 2002. The COPS Office estimated that hiring grant awards totaled about $5.6 billion as of June 3, 2003.

- Making Officer Redeployment Effective (MORE) grants, which are used to fund up to 75 percent of the total cost of acquiring new technologies and equipment and the hiring of civilians for 1 year. These are intended to allow police to spend more time patrolling the streets instead of on administrative and support tasks. According to the COPS Office, 24,436 full-time equivalent staff were redeployed through MORE grants as of July 26, 2002. The COPS Office estimated that MORE grant awards totaled about $1.3 billion as of June 3, 2003.

- Innovative grants, which are used to promote innovative approaches to solving crime in specific areas such as domestic violence and drug abuse. The COPS

[2]Zhao, J., Scheider, C. and Thurman, Q. Funding Community Policing to Reduce Crime: Have COPS Grants Made a Difference? *Journal of Criminology & Public Policy*, Nov. 2002 (vol. 2, no. 1).
[3]P.L. 103-322.

Office estimated that innovative grant awards totaled $820 million as of June 3, 2003.

Results in Brief

Our review of the 2001 study on the effects of COPS grants on crime rates indicated that the results of their study should be viewed as inconclusive. We believe that the study's limitations in data and methods are significant and preclude meaningful interpretation of the results. We cannot agree with Zhao et al. that their 2001 study shows that some COPS grants (hiring and innovative) significantly reduced crime because, among other things, important variables were omitted from their analyses, the analytic models were misspecified, and the sample of cities included in the study was limited. Further, we have concerns about the use of outdated census data for control variables. Aside from concerns about data and methods, we question whether the statistically significant crime reductions that Zhao et al. found are significant in a practical sense.

While we cannot agree with the Zhao et al.'s conclusions, we also cannot say that COPS grants are ineffective in reducing crime. A program's effects and researchers' ability to design studies that will accurately measure those effects are two different things. Other studies, which we have not reviewed, may have taken a more rigorous approach to assessing the effects of COPS grants on crime. We believe that a more rigorous study would incorporate, among other things, more reliable, valid, and complete measures; a more complete and generalizable sample of cities; and well-specified analytic models.

In written comments on a draft of this report, the Department of Justice's COPS Office and Zhao and Thurman generally disagreed with our findings. The comments reflected the view that our standards for critiquing Zhao et al.'s work were too stringent, that we were incorrect in concluding that their statistical models were misspecified, and that the statistical controls incorporated into their analytic models were sufficient to account for the types of missing data we identified as limitations of the study. In our response, we address why we continue to believe that these limitations render the findings of this particular study inconclusive.

Summary of Analysis and Results of the 2001 Study

The 2001 study presented a statistical analysis of the effects of three types of grants—hiring, MORE, and innovation—on the reported rates of violent and property crimes over a 5-year period across 6,100 U.S. cities that received COPS grants. The analysis, which looked separately at cities with populations greater than 10,000 and those with populations less than 10,000, sought to determine how the reported crime rates varied as a function of the amount of COPS funds received.

The variables used in the 2001 study are presented in table 1, along with the averages and standard deviations for these variables across all cities included in the analysis.

Table 1: Averages Across All Cities from 1994 to 1999

	Average	Standard deviation
Dependent variables (1995-1999)		
Violent crime rate (per 100,000 population)	769.63	674.50
Property crime rate (per 100,000 population)	5,016.39	2,820.74
Independent variables (1994–1998)		
Hiring grants (per resident)	$2.38	3.72
Innovative grants (per resident)	$0.42	2.45
MORE grants (per resident)	$0.65	1.45
Demographic control variables		
% unemployment (1994-1998)	4.97	2.17
% minority (1990 census)	30.40	23.32
% single parent households (1990 census)	10.59	4.09
% young people ages 15-24 (1990 census)	15.43	4.59
% home owners (1990 census)	56.92	14.62
% people in same household for 5 or more years (1990 census)	50.66	10.03

Note: Zhao et al. used weighted averages to estimate the means of COPS grants and control variables.
Source: Zhao et al., December 2001 and November 2002.

Zhao et al. found that hiring grants significantly reduced reported violent and property crimes in larger cities, but significantly increased those rates in smaller cities. They speculated that the addition of police officers in smaller cities could produce an increase in reported crime because, among other things, the increased interaction between police and the community can help residents feel more comfortable and willing to report crimes. Innovative grants also significantly reduced the reported violent and property crime rates in larger cities, but had no significant effect in smaller cities. MORE grants had no discernable effect in larger cities, or on reported violent crimes in smaller cities, but they significantly increased the rates of reported property crimes in the smaller cities. Zhao et al. concluded that innovative programs, which are targeted at specific crime problems or jurisdictions, had the strongest effect on reducing reported crime rates. They also observed that "crime reduction in the United States is not a unitary phenomenon" in light of the different effects found in large versus smaller cities.

Our Review Indicated Several Problems with the 2001 Study

Our review revealed several problems with the 2001 study that cast doubt on the validity of the conclusions about the effectiveness of COPS grants. The problems we identified pertain to Zhao et al.'s interpretation of their findings, omission of important variables from the analysis, misspecifications in the analytic models used, and sample selection issues. We also had some concerns about the outdated nature of census data used as control variables in the 2001 study.

The Meaning of the Study's Findings Can Be Interpreted Differently

The finding that COPS grants exerted different effects on crime patterns in large versus small cities led the researchers to observe that crime reduction is not a unitary phenomenon. While this may be the case, one can also conclude that the study's findings are equivocal, inconsistent, and inconclusive.

Further, while the crime-reducing effects that Zhao et al. found for hiring and innovative grants may have been statistically significant, they could also be

characterized as quite small in a practical sense.[4] Table 2 demonstrates this point by presenting a summary of Zhao et al.'s estimates.

Table 2: Estimates of the Effects of Three Types of COPS Grants, from Zhao et al. (2001)

City type	Crime type	Hiring Grants	Innovative grants	MORE grants
>10,000	Violent	-5.26*	-12.93*	-0.11
	Property	-21.63*	-45.53*	-1.52
1,000 - 10,000	Violent	0.83*	1.06	2.48
	Property	8.97*	11.98	31.20*
All cities 1000+	Violent	-1.86	-12.26*	0.28
	Property	-10.44	-43.85*	-0.28

Note: An asterisk (*) denotes that the estimated effect was statistically significant.
Source: GAO summary of Zhao et al. 2001 data.

The coefficients in table 2 indicate how much each grant dollar spent per person in each city affected the rates of reported violent and property crimes; in other words, how much of a change in the reported violent and property crime rates we might expect if funding were increased by one dollar per resident. As shown in table 1, the average annual COPS innovative grant across all cities amounted to $0.42 per person, and the average rates of reported violent and property crimes, respectively, were about 770 and 5,016 per 100,000. These coefficients imply that if COPS funding in larger cities for innovative grants were doubled (from $0.42 to $0.84 per person), we would expect the violent crime rate to go down by 0.7 of 1 percent (from 770 to 765 per 100,000).[5] We would expect the reported property crime rate to go down by 0.4 of 1 percent (from 5,016 to 4,997 per 100,000).[6] As small as the effects are, there are reasons to question whether they accurately represent the expected returns on such an investment, and these reasons are listed below in general order of importance.

Important Variables Were Omitted from the Analysis

While dummy variables were used in the 2001 study to control for unmeasured differences across counties, the only city-level variables in the analysis that were measured and explicitly controlled in the models of estimated COPS grant effects were (1) the 1994 crime rate and (2) the six demographic variables shown in table 1. Most conspicuously absent from these models is a measure of expenditures on police that were not derived from COPS grants. The researchers told us they did not include

[4]Statistical significance means that the observed effect does not result from chance alone. The number of observations in a sample can be an important determinant of statistical significance, with larger sample sizes frequently being associated with statistically significant findings. Zhao et al.'s 2001 study consisted of 36,605 observations, making it possible that statistically significant effects could have been found even when they were small on a practical level.

[5]This is calculated as follows: From table 2, we see that in cities larger than 10,000, each dollar of innovative grant funding was associated with a decrease of 12.93 violent crimes. $0.42 is 42 percent of 1 dollar, and 42 percent of 12.93 crimes equals 5.4. This represents the decrease in the expected crime rate as innovative grant funding increased by $0.42 per person. If the violent crime rate were 770 per 100,000 population, doubling the $0.42 innovative grant expenditure per person would reduce the violent crime rate by 5, or to about 765 per 100,000 population.

[6]The mean offered in Zhao and Thurman is a weighted average for all cities and only approximates the mean for large cities. Because of that, and the severe skew in the distribution of average grant amounts across cities (note the standard deviations in table 1), this may not be a very accurate way to estimate the effect size. The skew in the distribution of grant amounts also suggests that it might have been preferable to transform (using logarithms) those amounts prior to the analyses.

non-COPS funded police expenditures because such data are not available. Because the COPS program supports only a portion of police agency budgets, however, we believe the absence of any control for state and local expenditure to be a serious weakness.

Police departments that received COPS grants may have also received grants from other programs (such as Byrne grants). These amounts could be correlated with COPS funding amounts. For example, if a department is proficient in getting COPS funding, it may be proficient in getting other funding, as well. Without separating COPS funding from other types of funding that police agencies receive, we cannot be sure how much of an effect COPS grants by themselves have on crime reduction.

The study also lacked any measure of city size beyond the dichotomy (i.e., population smaller or larger than 10,000) used to split the sample of cities prior to model estimation. Other omitted measures include such socioeconomic variables as per capita income and percent male. County dummy variables controlled for some of the problems associated with omitted variables, but they would not control effectively for variables that differed across cities within counties, or variables that changed within counties over time. For example, if state and local expenditures on police varied across cities in a given county, using dummy variables to represent counties would not take these differences or changes into account in estimating the independent effect of COPS grants.

Misspecifications in the Analytic Models

The models employed in Zhao et al.'s analyses are two-factor fixed effects models that employ 2,674 dummy variables representing the counties and 5 dummy variables representing the years included in the analysis. These dummy variables controlled for unmeasured variability across counties and over time, and they supplemented the controls for prior rate of crime and the 6 demographic variables described above. These models and the estimation procedures they involve are fairly sophisticated, but since the data on crime rates and COPS funds were measured at the city level, we believe that unmeasured variability would have been more effectively controlled had dummy variables been used to distinguish cities, instead of the counties in which the cities were located.[7] With dummy variables representing counties, any unmeasured and systematic variability across cities within the same county remained uncontrolled and a potential source of bias in the parameters representing the effects of the COPS grants estimated in the models.

Sample Selection Limited

Zhao et al.'s analysis is focused only on COPS program grants used to fund local city police departments. Their report indicates that other law enforcement agencies, such as state and county police agencies; sheriffs' offices; campus police; and special purpose law enforcement agencies such as court, forest, and park police, among others, were excluded from their study. Since these other agencies accounted for

[7]A footnote in the 2001 study indicates that the researchers conducted initial analyses using city dummy variables. However, they ultimately decided to use county dummy variables, and all the report findings are derived from statistical models that included county rather than city dummy variables.

4,891 (or 40 percent) of the 12,070 law enforcement agencies receiving COPS grant awards from 1994 to 1998, Zhao et al.'s study omitted a large portion of COPS grant recipients. Further, there is likely to be considerable overlap across jurisdictions receiving COPS grants (cities within counties, campus police within city jurisdictions).[8]

According to Zhao et al., the sample of cities included in their study represented a subset of 6,100 of the 7,179 cities whose local city police departments received COPS grants at some point during the period from 1994 to 1998.[9] The researchers deleted 535 cities with populations less than 1,000, and 544 cities that lacked Uniform Crime Reports (UCR) data.[10,11] Four states (Delaware, Illinois, Kansas, and Montana) contributed only 8 cities between them owing to missing UCR data. These omissions may have affected the study's results. Of greater concern, however, is the omission of the potentially large number of cities that received no COPS funding at all. We believe that cities with no COPS funding should have been included in the analyses in order avoid sample selection problems and ensure that the results were generalizable across all cities.[12]

Concerns about Measures of Demographic Variables.

While the rates of violent crimes and property crimes were measured and allowed to vary in each of the 5 years from 1994 to 1998, in the 2001 study at least 5 of the 6 demographic variables were derived from the 1990 census and fixed at their 1990 levels. We believe the 1990 figures would be a poor basis for estimates because in many cities, the demographic characteristics of residents in 1990 would be expected to be quite different from those in the mid- to late-1990s; and in all cities, these time-invariant estimates would fail to account for the significant demographic changes

[8] For example, if the city of College Park, MD, received a COPS grant and the University of Maryland campus police (located in College Park) received a separate COPS grant, their joint impact on the city's crime rates would not be included in this analysis.

[9] In the analysis, the crime rates from 1995 to 1999 were intentionally lagged a year to allow these agencies to receive and deploy these funds.

[10] UCR is a nationwide database of police statistics consisting of crime data voluntarily reported to the Federal Bureau of Investigation by nearly 17,000 city, county, and state law enforcement agencies. UCR data form the basis for a Crime Index, which is used to gauge fluctuations in the nation's overall volume and rate of crime. The offenses included in the "violent crime" category are murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. The offenses included in the "property crime" category are burglary, larceny-theft, and motor vehicle theft, and arson.

[11] In personal discussions with the researchers, we learned that their 2001 published study contained an error related to missing data. Specifically, the researchers had intended to eliminate cities from their analysis if crime data were missing for even a single month of the year. However, the dataset they obtained did not uniformly distinguish between missing data and "zero" reported crimes. In those cases, the analysis would have produced an underestimate of the 12-month crime rate. After publishing their results, the researchers corrected these data errors and reanalyzed the dataset. They told us that the revised results did not differ substantially from those published. Time limitations prevented us from assessing the revised results.

[12] In a November 2002 publication in the *Journal of Criminology and Public Policy*, Zhao et al. explained that their analyses omitted cities without COPS grants because of concern that including these cities would produce a downward bias in their estimation of COPS program effects. They said this is because crime was decreasing across the board between 1994 and 1998 in cities with and without COPS grants. We disagree with their rationale. Since Zhao and Thurman controlled for the baseline rate of crime by including the 1994 rate in their model as a control variable, cities with COPS grants would presumably have a higher rate of decrease than cities without COPS grants. We continue to believe that Zhao and Thurman's estimates of COPS program effects were biased as a result of omitting cities that did not receive COPS grants.

that may have occurred over time. It was not entirely clear to us how the unemployment data derived from the U.S. Department of Labor Statistics for the years 1994 to 1998 were used in these models. However, it too represented a potentially poor measure of unemployment in many cities. This is because data are not available for cities with populations less than 25,000, and county-level rates were used for those cities instead.

Comments on Zhao et al.'s Draft Updated COPS Study

Our previous comments pertain to the unpublished 2001 study by Zhao and Thurman and the 2002 publication by Zhao, Scheider, and Thurman which resulted from the study and which was virtually identical to the unpublished study in terms of the primary results that were reported. That study, as we noted previously, relied on data from 6,100 cities for which COPS grant data for the years 1994 to 1998, and UCR crime data for the years 1994 to 1999, could be obtained. After reviewing that work, we received a draft updated report from those authors that re-estimated the effects of COPS grants on crime rates using data from an additional year (e.g., COPS grant data for 1994-1999 and UCR data for 1994-2000)[13] and models that incorporated updated 2000 census data and allowed the demographic characteristics to vary over time. While these newer estimates, like those in the 2001 and 2002 reports, were derived from models that used county dummy variables, we also received from the researchers additional information that showed how results compared when they used dummy variables representing cities in place of the county dummy variables.

These updated results are shown in table 3, along with the results from the researchers' prior study. The researchers have asserted, both in the draft updated report and in their conversations with us, that these updated results are largely consistent with the previously published results, and in a general sense we agree with this. That is, with or without the newer data, regardless whether demographic factors are allowed to vary, and regardless whether county or city or dummy variables are used, both studies found (1) no evidence that COPS grants have diminished the crime rates in cities with populations less than 10,000, and (2) some evidence that they have done so in larger cities. Apart from this general observation, however, the results of the two studies are inconsistent in that the size and significance of some of the estimated effects of COPS grants differed under alternative specifications. For example, when updated data and the time varying covariates were used, the estimated effects of innovative grants on violent and property crimes in large cities declined in size to less than half of the prior estimates, while the effects of MORE grants increased more than 10-fold, and became statistically significant in the case of property crimes.[14]

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[13]One difference in the crime rates analyzed in the two studies was that arson was included as a property crime in the newer study, but not in the 2001 study.

[14]The authors provided us with additional information from their follow-up study on the analytic results obtained when they used dummy variables to represent cities instead of counties. They found that in large cities, the estimated effects of hiring grants on violent crimes doubled, the estimated effects of MORE grants doubled and became statistically significant, and the effect of innovative grants became statistically not significant. The effect of MORE grants on property crimes remained significant in large cities when city dummy variables were used, but diminished to half the size that was estimated by a model that used county dummy variables.

Since these newer results have not been finalized, it is premature for us to make a final determination of their validity and usefulness. The researchers are to be commended for the considerable effort they made to determine how reliable and robust the estimated effects of the different COPS grants were over time, and under alternative specifications. Nonetheless, the newer study that we reviewed had some of the same limitations as the 2001 study. Specifically, the newer study (1) omitted important variables, including measures of expenditures on police apart from COPS grants, (2) omitted a large number of cities that did not receive COPS grants, and (3) did not control for the effect of city size on crime in a more refined fashion than dichotomizing city populations. Our review of the results of the newer analyses has not fundamentally altered our view that the estimated effects of COPS grants on reported violent and property crimes were small in a practical sense. Again, it is important to note that this does not imply that COPS grants do not have positive effects in reducing crime; only that it is hard to reach firm conclusions about their effects from the particular studies we reviewed. Our technical assessment of Zhao et al.'s work is not a commentary on the effectiveness of the COPS program.

Table 3: Zhao et al.'s Estimates of the Effects of Three Types of COPS Grants with Dummy Variables Representing Counties in (a) 2001 Study Using 1994-1999 Data and (b) Draft Updated Study Using 1995-2000 Data

City type	Crime type	COPS study	Hiring grants	Innovative grants	MORE grants
>10,000	Violent	2001 study	-5.26*	-12.93*	-0.11
		Draft updated study	-5.49*	-5.31*	-2.00
	Property	2001 study	-21.63*	-45.53*	-1.52
		Draft updated study	-25.22*	-20.65*	-21.47*
1,000 - 10,000	Violent	2001 study	0.83*	1.06	2.48
		Draft updated study	1.47*	0.60	2.92
	Property	2001 study	8.97*	11.98	31.20*
		Draft updated study	7.91*	1.30	30.51*

Note: An asterisk (*) denotes that the estimated effect was statistically significant.
Source: GAO summary of Zhao et al.'s 2001 and updated studies.

Agency Comments and Our Evaluation

The Acting Deputy Director of the COPS Office and Professors Zhao and Thurman provided us with written comments on a draft of this report. Their comments contained a number of points that disagreed with the limitations we identified in our assessment. The comments reflected the view that we (1) applied an overly stringent standard to the study's design and failed to consider the fact that this study was better and more comprehensive than previous research on the subject; (2) were incorrect in concluding that their statistical models were misspecified and did not control for the effect of missing police expenditure data; (3) were ill-advised in stating that including data on cities' access to grants other than COPS grants would have improved the estimates of COPS grant effects; (4) were ill-advised in stating that including data on such socioeconomic variables as percentage of the population that is male would have improved the estimates of COPS grant effects; (5) were incorrect in stating that including data on COPS-funded jurisdictions within cities, such as

university police, would have improved the estimates of COPS grant effects; and (6) were ill-advised in stating that including police departments in cities that did not receive COPS funding would have improved the estimates of COPS grant effects. We continue to disagree with the researchers on these key points and discuss our reasons below.

First, with respect to the assertion that our standards were too high and that we did not consider the advances made by this study, we would reiterate that the purpose of our assessment was to determine the extent to which the conclusions of this particular COPS study were supported by the data used and analyses conducted. Because we were asked to review this single study and did not have time to review any others, we cannot comment on whether and how this study's approach to evaluating the effectiveness of the COPS program may have been an incremental improvement over other similar efforts. We acknowledge in the introduction to this report that it is extremely difficult to assess program effectiveness via aggregate level analyses. We also believe that the researchers should be commended for their efforts, which involved merging data on more than 6,000 towns and cities over a multi-year period from four different sources and using sophisticated methods to analyze those data under a variety of specifications. But, in our estimation, the problems that we identified with the research make the results more suggestive than conclusive.

Second, with respect to the assertion that the statistical models were both correctly specified and sufficiently controlled for the effect of missing data on police expenditures, we do not believe this was the case. Zhao et al. believe that we are unjustifiably critical of their having used county rather than city dummy variables in estimating the effects of COPS grants on crime rates. They point out that they ran both their 2001 and 2003 analyses using both city and county dummy variables, and the results of the two types of analyses did not differ substantially.[15] While the models incorporating county or city dummy variables do, as the authors assert, explain a sizable portion (between 64 percent and 86 percent) of the variation in reported crime rates across cities over time, this is not surprising and is largely attributable to the very large number of dummy variables included in their models. The proportion of variance explained, however, does not necessarily imply that the estimates of the effects of COPS grants were unbiased. The authors, in our opinion, are mistaken in their claim that the use of dummy variables controls for the effects of all unmeasured differences between cities and over time. That is, the county dummy variables do not control for unmeasured differences between cities within counties, and even the combination of city and year dummy variables do not control for differences within cities over time, unless the changes in all cities are similar. Crime rates in cities did not show similar changes over time,[16] however, and there are many

[15]The researchers noted that they recently collected original police expenditure data from 55 of the largest police departments and found that including these data in the statistical models showed that they had virtually no effect on their estimates of the effects of COPS funding. We appreciate the difficulty of obtaining police expenditure data for large cities and endorse efforts to marshal supporting evidence from a sample of those cities. However, we have not seen the results of these analyses and have no basis to judge how representative these 55 cities are of large cities in general, or whether the estimated effects of COPS grants from the 55 cities are generalizable to larger cities generally.

[16]Bureau of Justice Statistics data on 62 local police departments serving cities with a population of 250,000 or more revealed a high degree of change in violent and property crime rates within the same city over time. For example, New York's reported violent crime rate dropped by 57 percent between

factors that can change in cities from one year to the next in ways that might affect crime rates. For example, fluctuations in local, state, and other expenditures on police could produce changes in crime rates within cities over time, and the failure to control for such factors can seriously bias the estimates of the effects of COPS grants.

Third, with respect to the assertion that omitting data on cities' access to grants other than COPS grants probably did not affect the results, we are not convinced. We agree that data on grants that cities receive are not readily available. However, we believe that information on at least major grant programs could be obtained from the Office of Justice Programs. To the extent that cities that receive COPS grants may be more likely to receive other types of grants, omitting consideration of other grants that are also targeted at reducing crime may lead to an overestimation of the effects of COPS grants. By restricting their attention to COPS grants awarded to city and local police, the researchers investigated the effects of only a portion of all COPS grants. They ignored the effects of other grants and of state and local expenditures, generally, and therefore increased the potential for obtaining biased estimates of COPS grant effects.

Fourth, with respect to the assertion that the study's results were not impaired by the omission of such socioeconomic variables as percentage of the city population that is male, we disagree with the researchers that this is not problematic. They assert that (1) the dummy variables in their statistical models controlled for the effects of socioeconomic variables other than those in their analyses, (2) a city's male population should not significantly affect the estimated effects of COPS grants on crime, (3) the socioeconomic variables included in the analyses were sufficient and grounded in widely accepted social disorganization theory, and (4) problems of multicollinearity[17] could have arisen had they included additional socioeconomic variables. As with police expenditures, we maintain that data on factors affecting crime rates that vary across cities and over time should be included in analyses, and may not be sufficiently controlled by statistical models that use dummy variables to control for unmeasured differences. While we do not know whether and how COPS grant amounts to cities may be associated with the socioeconomic characteristics of city residents, the literature indicating a gender difference in crime is extensive.[18] To the extent that socioeconomic characteristics affect crime rates, and to the extent that cities that received COPS grants may have different socioeconomic characteristics, we believe it would be wise to incorporate such variables into models to lessen any potential bias in the estimates of the COPS grants on crime. Since this study was intended to be an evaluation of the effects of COPS grants on crime and

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1990 and 2000, while Nashville's rate increased by 29 percent during that same time period. Similarly, New York's reported property crime rate dropped by 60 percent, while Nashville's rate increased by 22 percent. (*Police Departments in Large Cities, 1990-2000.* Department of Justice, Bureau of Justice Statistics, May 2002).

[17]Multicollinearity means that the independent variables are highly correlated. If this occurs, it is impossible to distinguish between them in estimating their effects on the dependent variable.

[18]For example, a Bureau of Justice Statistics study indicated that men comprised 93 of the state prison population in 2001; 93 percent of the federal prison population in 1997; and 90 percent of the local jail population in 1996 (*http://www.ojp.usdoj.gov/bjs/crimoff.htm#findings*). Another study reported that in 1960, 1975, and 1990, men were arrested at much higher rates than women for all crime categories except prostitution (Steffenmeier, D. and Allen, E., "Gender and Crime: Toward a Gendered Theory of Female Offending," *Annual Review of Sociology, 1996, vol. 22, pp. 459-87).*

not as a test of social disorganization theory, we do not believe that limiting the socioeconomic control variables to those dictated by this particular theory was warranted. Finally, with 36,000 observations in their study, we do not believe that multicollinearity would have been a problem had additional socioeconomic variables been included in the analyses.

Fifth, with respect to the assertion that including data on COPS-funded agencies within cities would not have improved the estimates of COPS grant effects, we continue to believe that this cannot be known. Zhao and Thurman state that there is no meaningful way to include such agencies—for example, park and university police—in their statistical models because the jurisdictions overlap. They note that it was neither necessary nor possible to estimate the effects of such agencies on crime rates because they report crime incident data to the Federal Bureau of Investigation separately and because census data for them are not readily available. We maintain that by restricting their attention to crimes reported to local and city police departments, the researchers are investigating the effect of only a portion of all COPS grants and are looking at only a subset of all crimes reported. Again, we do not know whether these restrictions result in an overestimate or underestimate of the effect of COPS grants on crimes, but they can potentially bias their estimates. We acknowledge that data may not be readily available for such an analysis, but that does not mean they cannot be collected or that they are unimportant.

Sixth, with respect to the assertion that including data on police departments in non-COPS funded cities would not have improved the estimates of COPS grant effects, we continue to disagree. Zhao and Thurman note that because small cities are more likely than large cities to not receive COPS funding, including nonfunded agencies in their analysis could bias the findings towards showing an effect of COPS grants. It is our view that missing cases, except when they are missing at random, should be regarded as problematic. The 6,100 agencies that Zhao et al. analyzed represented about 85 percent of the COPS-funded city and local police departments, 51 percent of the total number of COPS-funded agencies, and 36 percent of the agencies that participate in the UCR system. Some of these exclusions may have been unavoidable, but their cumulative impact is likely to be non-negligible.

We do not know how or to what extent the findings that Zhao et al. obtained would change if the limitations that we identified in our assessment were successfully resolved. We do know, however, that while Zhao et al. may have performed the most sophisticated and advanced research on the topic, drawing inferences or making policy decisions about COPS grant effects from this work are unwarranted at this time. Indeed, Zhao and Thurman are themselves continuing this work, an indication that they also believe refinements are needed.

The comments from the COPS office and the researchers are reproduced in the enclosure to this report. The COPS Office also provided us with technical comments, which we incorporated in the report as appropriate.

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As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of this report.

We will then send copies of the report to the Attorney General and will make copies available to others upon request. In addition, the report will be available at no charge on GAO's web site at http://www.gao.gov.

If you have any questions about this report, please contact me at (202) 512-8777. The key contributors to this report were David Alexander, Carl Barden, Evi Rezmovic, and Douglas Sloane.

Sincerely yours,

Laurie E. Ekstrand
Director, Homeland Security
and Justice Issues

Nancy Kingsbury
Managing Director, Applied Research
and Methods Issues

Enclosures - 2

Enclosure I

U.S. Department of Justice

Office of Community Oriented Policing Services (COPS)

June 5, 2003

VIA FACSIMILE and ELECTRONIC MAIL

Laurie E. Ekstrand
Director, Homeland Security and Justice
United States General Accounting Office
Washington, DC 20548

Nancy Kingsbury
Managing Director, Applied Research and Methods
United States General Accounting Office
Washington, DC 20548

Dear Ms. Ekstrand and Ms. Kingsbury:

The U.S. Department of Justice Office of Community Oriented Policing Services (COPS Office) thanks the GAO for conducting an audit of the methodological approach used in the December, 2001 study, "The National Evaluation of the Effect of COPS Grants on Crime from 1994 to 1999." We welcome the GAO recommendations and appreciate the opportunity to respond to the review.

COPS Office Grant Programs

Since its creation, the COPS Office has assisted nearly 13,000 of the nation's approximately 18,000 law enforcement agencies in implementing community policing. The COPS Office has invested $9.6 billion to add officers to the nation's streets and schools, enhance crime-fighting technology, support crime prevention initiatives, and provide training and technical assistance. Specifically, to date, the COPS Office has provided funding to hire or redeploy 116,000 police officers and sheriff's deputies. Currently, over 83,000 of them are on the beat. In addition, the COPS Office has funded 6,000 school resource officers (SROs), provided $1.1 billion in crime-fighting technology and $200 million in law enforcement assistance to Indian Country. Moreover, through a national network of COPS Regional Community Policing Institutes (RCPIs), the COPS Office has provided training for 209,000 law enforcement personnel, government leaders, and community members in various community policing strategies. This substantial support for State, local, and tribal law enforcement has produced real results for communities across the nation.

National Evaluation of the Effect of COPS Grants

The COPS Office is committed to the continuous evaluation of its programs and their impact. In 2000, the COPS Office funded a study specifically to assess the impact of COPS funding on crime and how, within the bounds of legislation, COPS can develop grant programs that best support State, local and tribal law enforcement. The study was also designed to respond to the requirements of the Government Performance and Results Act (GPRA), requiring Federal agencies to collect and analyze data on the impact of their programs and activities.

As the GAO report notes, the social science involved in assessing program effectiveness is difficult, in part because direct measures of important variables are not always available. With this in mind, the COPS Office engaged the University of Nebraska (Omaha) and two distinguished researchers to conduct the study. After almost 12 months of research and analyses, including rigorous, independent peer reviews by well-respected social science experts, the researchers concluded that COPS hiring and innovative grant programs have a significant crime reducing effect on the vast majority of the population of the United States.

Extensive Peer Review Process by Social Science Experts

The study was subject to a rigorous review of its methodology and results. A total of eleven independent social scientists and statisticians peer reviewed the study. Specifically, the initial study was submitted to three peer reviewers. Thereafter, five additional social scientists peer reviewed an article based on the study that was published in *Criminology and Public Policy*, a prestigious criminal justice journal. Finally, the researchers' pending update of the study, referenced by the GAO, has likewise been submitted to three experts for peer review. Eight of these eleven experts determined that the methodological approach taken by the researchers was sound. One reviewer did not reach a final conclusion, and the two remaining individuals offered recommendations, many of which are identical to those now raised by the GAO.

In response to the external peer review, the researchers either amended the study or determined that the recommendations would have an insignificant or, in one case, a detrimental effect on the validity of the study. The researchers' extensive reasons as to why the recommendations were not included, why the recommendations would not likely result in an improved analytical model or why their inclusion may unfairly skew the results in favor of finding an impact of COPS grants on crime, are set forth in the attached response from the researchers to the GAO report. For example, the researchers point out that updated 2000 Census data was not available at the time of the study. In addition, the absence of police expenditure data was addressed by including the 1994 crime rate (as a reflection of the ability to control crime with local resources) and county and city dummy variables (standard variables used to control for unexplained phenomena in this type of study) as substitutes that captured this and other omitted control variables. Furthermore, researchers believed that including non-funded agencies would bias the results in favor of finding an impact of COPS funding on crime.

GAO Audit Overlooks Significant Variable

The GAO is mistaken in stating that the researchers did not conduct the analysis using city dummy variables. In fact, the researchers did conduct a separate analysis using city dummy variables in order to verify the reported county dummy variable analysis as is indicated in footnote 25 of the researchers' study. Use of the city dummy variables addresses the GAO issue regarding misspecification of the model – a large part of the GAO's critique. In addition, the inclusion of these variables attempts to compensate for the absent control variables that the GAO mentions.

Validity of Researchers' Study

The GAO itself commends the researchers for the considerable efforts made to consider alternative evaluation methods and to ensure the reliability of the results. Given the recognition by the GAO of the limitations inherent in this type of social science research, as well as the particularly extensive peer review, the COPS Office is satisfied that the study used a sound methodology given the data available at that time.

According to the findings of the study, $100,000 in COPS hiring grant dollars provided to a city of 100,000 will result in an approximate reduction of five violent crimes and twenty-one property crimes, a total reduction of twenty-six crimes. Given that the COPS Office has provided billions of dollars in funding to cities, the number of serious violent and property crimes reduced by COPS grants, according to the study, is in the many hundreds of thousands.

Pending Updated Report

Prior to the GAO report, the COPS Office requested that the researchers update the study. The updated study will address the issues raised by the GAO and will include: analyzing the 2000 census data not available at the time of the initial study, adding city dummy variables as was done in the initial study, conducting a separate analysis of the possible influence of police expenditures, and adding the non-funded agencies in the analysis. We look forward to the results of the updated study.

Sincerely,

Pamela Cammarata

Pamela Cammarata
Acting Deputy Director

Attachment

cc: Vickie Sloan
Director, Audit Liaison Office
Justice Management Division

Cynthia A. Bowie
Assistant Director
COPS Compliance Division

Enclosure II

CRIMINAL JUSTICE

University of Nebraska Omaha

June 5, 2003

Laurie Ekstrand, Director Homeland Security and Justice
United States General Accounting Office
Washington, DC 20548

RE: Response to *Technical Assessment of Zhao and Thurman's 2001 Evaluation of the Effects of COPS Grants on Crime*

Dear Ms. Ekstrand,

Our response to the General Accounting Office's (GAO) review of our research is as follows. We begin with prefacing remarks that address our concerns with the review process, followed by detailed responses to specific points of criticism that the GAO review raised regarding the quality of our work.

First, we want to apologize upfront for the brevity of our remarks. Since the GAO was given such a short timeframe in which to complete their review and we were only given 36 hours in which to respond to it once the GAO report became available, we feel that we may be inadequately prepared in this endeavor. While we initially were hopeful that additional scrutiny of our work might shed light on its value as the most comprehensive study to date on a very challenging research question, we since have been largely disappointed in the approach the GAO has taken in its review. But let me further explain.

While we were not surprised by the questions the GAO review team asked, we are a bit perplexed at the questions they did not ask and as to why the answers that we gave during our teleconference with the GAO review team were not later considered in the GAO report (we will elaborate on these in more specific detail below).

Harvard University Professor Mark Moore (Moore is also the Chair of the Kennedy School's Program in Criminal Justice Policy and Management) refers to the work based on the study published in *Crime and Public Policy* (in the same issue of the journal) as something that "could be viewed as a classic piece of program evaluation" (p. 36). And while he does not fully endorse our approach, he comments that he instead "will stand aside in awe of the brute empiricism of a sample of five years of federal funding for police and crime experience in 6,100 cities and towns" (p.36). He instead levels his criticism at the lack of focus on the policy implications of the research and goes on to make a persuasive argument that social science research is ill-equipped to address policy questions, stating "social science findings can never fully dictate the right answer to an important policy question. They cannot do this

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even when the methods are deployed powerfully in program evaluations. And it is not just because the relevant sciences are not yet mature. It is because important normative questions remain entirely beyond the reach of science, and because any important policy choice involves important positive issues that science has not yet, or could not easily ever reach." (p.42). Such is the case here.

Rather, we attempted simply to look at the Office of Community Oriented Policing Services' (COPS) support of American policing over time using available data sets of a secondary nature and at the aggregate level to explore any effects on crime that might be linked to three different types of programs that the COPS Office had employed over a six year period. This study was not intended to be definitive. We undertook this research primarily motivated by intellectual curiosity as we collected our data and reported our findings along the course of ongoing analyses (and our analyses are still ongoing). Thus, we believe that the GAO review team never asked the most compelling question that should have been asked, namely how does this work compare with or advance existing knowledge on this subject?

Granted, our work may not be perfect (the fact that available data needed to do this work had to be fully assembled from scratch and did not previously exist in a readily usable form that would have made a perfect study possible or even plausible) but we strongly believe it to be better and more comprehensive than any previous research on this subject. Not only was our work not compared to any other study on this topic, the standard applied to our work by the GAO review team was the toughest of all—the phantom perfect design standard—which leads us to our final remark before getting into more specific detail.

The GAO review failed to consider the value of our work in a relative sense. That is, although this study may be imperfect (we would not argue this point), the questions that they should ask concern the extent to which our analyses are reasonable considering the data that exist in the real world with which to explore this research question. The GAO is silent on this point unlike the numerous reviews we received from knowledgeable and independent sources that were called upon to examine this work during a rigorous peer review process. Now on to our more specific comments.

We appreciate this opportunity to respond to the issues brought up by the General Accounting Office in reference to our research report. The GAO presents reasonable questions that were not unanticipated given the rigorous peer reviews that we have encountered previously. We have carefully weighed the costs and benefits of alternative choices and have presented a statistical model that we feel provides the most accurate and fair picture of the issue given the available data. We would like to address how we dealt with each of these issues separately:

Omitted variables

Ideally, a researcher would like to include the variables of interest in the analytic equation to say with absolute confidence that every potential control variable is included. In reality, however, there will always be variables that should be included but are unavailable for inclusion. This issue, omitted variables, is a weaknesses in all social science research. There is no exception for the research that we report here. Several control variables were simply

unavailable at the city level. Researchers do their best to address the issues using alternate variables and complex statistical modeling. It is our opinion that this report does a better job than most at handling this ever-present issue.

The GAO report states that the following important variables were omitted from the analysis, police expenditure, access to other grant programs, a measure of city size, percent male, and per capita income. A special statistical advantage of panel data analysis (analysis that tracks variables over a period of time) is that it is able to capture unobserved variance. By using dichotomous variables (e.g., city, county, and year dummy variables), we were able to control for systematic and unobserved variance across the time period studied (a period of six years). The effect of the county dummy variables, in fact, represents the most significant effect in the entire equation. In simple terms, the inclusion of these dummy variables is an attempt to statistically account for systematic and unobserved control variables that were not specifically included in the model. This is the unique benefit of this type of panel study as much social science research involves the analysis of data at only one point in time (cross-sectional) and is unable to use this advanced statistical technique. It should be emphasized that the models run in this study (as is noted in footnote 25) were in fact also run using city dummy variables. This use of city dummy variables is an attempt to control for all of the omitted control variables mentioned above. In addition, the explained variance in the models is at an extremely high level (the R^2 of the models ranges from .64 to .86). The vast majority of social science research is only able to explain a much smaller percentage of the variance (often ranging from .10 to .20). Because so much of the variance is explained by the dummy variables, this makes it even less likely that the additional controls requested would meaningfully affect the results as their effects are likely encompassed in the already present controls. However, we will address each of the control variables in turn.

Police expenditures

There is no documented information on police budgets for the agencies included in the analysis that is collected annually across the study period. Accordingly, as a means of addressing this concern, we adjusted the statistical modeling and included the 1994 crime rate and county and city dummy variables as substitutes in order to attempt to capture this (and other) omitted control variables. In our analysis, the 1994 crime rate was used to control for the level of crime (presented as a rate) in a given city when COPS grants became available. We did this based on the assumption that the 1994 crime rate reflected the ability of police agencies to control the level of crime incidents by local police agencies with given, or "typical," resources including budget, personnel, etc. (budgets without COPS funding). In addition, we have recently completed a follow-up study in which we collected original police expenditure data (minus COPS funding) from 55 of the largest police departments. We included this data in statistical models very similar to those reported here. The findings showed that the inclusion of police expenditure had virtually no effect on the COPS funding. Because of this, and because an attempt was made to take this variable into account in the above mentioned ways, we find it unlikely that the inclusion of this additional control variable would alter the findings.

Access to other types of grants

The GAO report raises the possibility that some agencies are more adept at receiving all kinds of grant funding, including COPS grants, and that this may bias the results in someway. First, this data would be very difficult to obtain, particularly at the agency level distributed by each state across the years of study. Second, there is an attempt to control for factors such as this in the model through the use of county and alternatively city dummy variables as is discussed above. Moreover, the COPS Office has provided funding to over 12,000 of the approximately 18,000 law enforcement agencies in the country. In addition, the COPS grant application process has been widely regarded by law enforcement as one of the most user-friendly. Thus, it appears that the application process for COPS grants is such that a very wide range of agencies has access to them. Because of the widespread access to COPS grants and because of the inclusion of the dummy variables we felt it unlikely that this possibility would alter the reported results and did not have any other means by which to take this variable into account.

Measure of city size

City size is standardized in the models through the examination of crime rates. In addition, all the models are weighted by city population. We did determine that there may be an interaction effect between city size and the effect of COPS grants on crime. Therefore, we did conduct an examination of this by splitting the model into two categories, those with populations greater than 10,000 and those with populations less than 10,000. The overall crime drop in the 1990s was dramatically apparent across the nation. However, the rate of the crime drop differed significantly among cities. One of the most important variable to distinguish the variation in the patterns of this crime drop is the size of the city. The crime drop, for example, was more closely associated with larger cities than with smaller ones as is detailed in the study. In our analysis, we found that the crime drop was indeed different between larger and smaller cities. We decided, consequently, to adopt the method used in the Uniformed Crime Report compiled by the FBI. Following their lead, we decided to split the police agencies into two categories: cities with a population of 10,000 and over versus cities with a population of 10,000 and below. This design allowed us to uncover the differences between the effect of COPS funding between these two groups.

Socioeconomic Variables

The GAO report suggests that per capita income and percent male should also be included in the models. However, these effects, if any, would be captured through the inclusion of other socioeconomic variables and the city dummy variables as mentioned above. Moreover, another important issue of omitted variables concerns the relationship between the specific omitted variables and COPS grants. If the relationship between the two is orthogonal (little association) then the exclusion of that omitted variable won't introduce bias in estimating the effect of COPS grants. For example, there is no evidence to suggest that decisions made by the COPS Office to distribute grants or for agencies to acquire grants is in any way based on percentage of male in a city. Then, the percentage of male will not significantly affect the contribution of COPS grants on crime reduction. Furthermore, multiconearity is always a

problem when socioeconomic variables are used in an analysis. Therefore, social scientists attempt to select a few crucial ones instead of casting a big net. In our analysis, the six socioeconomic variables (percentage of unemployment, percentage of minority, percentage of single mother household, percentage of young people between 15 to 24, percentage of living in the same home for the past five years, and percentage of home owners) are derived from social disorganization theory developed by Shaw and McKay and have been widely used for the past fifty years. These variables are used in the studies published in the best journals of our discipline (e.g., Osgood and Chambers 2000; Reisig and Parks 2000). In contrast, we don't think that researchers have ever used percentage of male in a similar analysis. In addition, the percentage of male is relatively stable over the last decade. There is no reason to believe that the male population increased sharply during the past decade in the U.S. with a similar sharp decline of female population. Almost certainly not enough to account for any of the relationship between COPS grants and crime.

Misspecifications in the analytic models

We were fully aware of the issues involved with the use of county dummy variables, not city dummies in our 2001 study. We decided to use county dummy because the fixed effect of city dummy would wipe out all the contribution of 1990 socioeconomic variables. In our follow-up study, both county and city dummies were used when socioeconomic variables were time-varying across the years of study. The findings are consistent in that the use of county and city dummies was not a decisive factor in determining the effect of COPS grant on crime reduction between 1995 and 2000.

Therefore, the results of a follow-up study on the use of city and county dummies should be incorporated into this section, and it should be made clear that there is no misspecification in the analytic models in the follow-up study. Further, the comparison between the two studies indicates that county dummies do not introduce significant estimation bias in the 2001 study. In addition, as is indicated in footnote 25, the city dummy variable analysis of the initial study was conducted in an attempt to further verify the results.

Sample selection is limited

The missing cases in the model are due to two factors. First, agencies with populations less than 1,000 were removed. As is described in the report, these agencies were removed because they introduced a great deal of variation in the model that made the estimates unstable. The other factor was missing UCR data. A few states (Delaware, Kansas and Illinois) do not typically report UCR data to the FBI. We are well aware of this limitation.

The report is clear that it only addresses COPS grants to cities and does not evaluate the effect on grants to special police, county, state and university police. There is no meaningful way to include these types of agencies in the model because of overlapping jurisdictions. If they were to be included this would introduce a substantial amount of error into the analytical models. Thus, the analysis was limited to the defined boundaries of cities and both the COPS and crime variables were measured at this level. Furthermore, the GAO study argued that nested effect of other law enforcement agencies located in the city (e.g., school

district police, university police, park police, sheriff office, etc) may also contribute to the crime decline in a city (usually big cities). Theoretically, they are right, but practically it is not necessary and impossible to estimate the effect of these agencies' contribution due to two primary reasons. First, these agencies report their own separate annual crime incidents to the FBI. It is reasonable to assume that any crossover due to reporting is minimal. Second, there is no census information on school district police, park police, etc. Lack of socioeconomic variables makes the estimate of the effect of these agencies impossible. In the hundreds of studies on city crime in the past four decades we don't recall even a single study that attempts to measure the crossover by including school district police, court police, park police in an analysis.

Including non-funded agencies

In an ideal analysis, a researcher will analyze differences between two groups: an experimental group and a control group. Additionally, the assignment of individuals to each of these groups should be random, in order to make reliable comparisons in outcomes between the groups. In social science research, however, a design of this nature is rarely utilized and often not possible. This is the case in the current study.

In the final data set, all cities with greater than 150,000 population received COPS grants between 1994 and 1999 (the period of study). Additionally, about 90% of cities greater than 10,000 population were funded by the COPS Office during the same period. Consequently, this analysis not only includes the population of all the large cities in the United States (with the exception of Chicago due to missing UCR data) but also a sample of many much smaller cities that received COPS funding as well. Since the COPS Office has provided funding to the vast majority of municipal city police departments, the numbers of non-funded agencies is small in the cities with a population over 10,000. For example, in 1994, there were only 335 non-funded cities over 10,000 population that were excluded from the analysis (there were over 2,200 COPS funded cities in 1994 in the same population group with a selection of 12 months reported). The mean population of these cities in 1994 was 29,675. Thus, the inclusion of these 335 cities is unlikely to influence the significant results found in this population category as there are so few of them.

Moreover, we believe that these non-funded agencies in cities with a population over 10,000 do not represent a similar comparison group. That is, if a comparison group of non-funded agencies were to be included, it may bias the findings towards showing an effect of COPS grants because these non-funded agencies would be relatively small in size.

Our design, a panel data analysis, allows us to assess the effect of COPS funding between agencies that received a large amount of grant funding with those that received a small amount or no funding in a given year during the period of study. This type of analysis allows for an investigation into whether variation in funding would lead to a variation in the crime drop between 1995 and 2000. This type of comparison of variation in "treatment" levels (funding amounts in this case) is at the very heart of much social science research. However, we will conduct additional analysis in the follow-up study to include non-funded agencies

with complete UCR data and the results will be put in the Appendix section of the updated report.

Summary

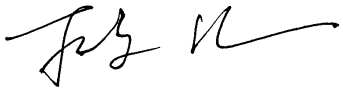
In total, the COPS Office sent this and the similar follow-up study to six anonymous independent external peer reviewers. In addition, a version of this study has been published in *Criminology and Public Policy*, a well-respected journal sponsored by the American Society of Criminology. In order to gain admittance to this journal, the paper underwent an additional thorough peer review process incorporating the comments of five additional separate professional reviewers. The successful publication in this journal speaks to the soundness of the methodology used in comparison with other published research projects.

We would welcome specific recommendations from the GAO team outlining their vision of a practical study design that can be conducted in reality. In addition, we would like to discuss with them several specific issues involved with measurement (e.g., how one would account for the contribution of campus police or citizen participation at the city level).

All social scientists are confronted with a variety of methodological choices when conducting research. We have carefully weighed the costs and benefits of alternative choices and have presented a statistical model that we feel provides the most accurate and fair picture of the issue given the available data. Because no piece of social science research is perfect it should always be viewed as adding to the body of knowledge with respect to a specific topic. We feel that this research accomplishes this goal as it provides some evidence that is on par with and in some ways superior to the types of evidence typically referenced regarding these types of policy relevant issues.

Jihong "Solomon" Zhao, Ph.D.
University of Nebraska at Omaha
University

Quint Thurman, Ph.D.
Southwest Texas State



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