Further Tests of the Influence of Black Mayors on Murders of Police: A Response to Jacobs

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This is the author's manuscript of the article published in final edited form as:
Kaminski, R. J., & Stucky, T. D. (2010). Further Tests of the Influence of Black Mayors on Murders of Police: A Response to Jacobs. Homicide studies, 14(2), 202-212. http://dx.doi.org/10.1177/1088767910364746

In a reanalysis of data used by Jacobs and Carmichael (2002), we found that a key theoretical variable (presence of black mayors) was unrelated to killings of police once a correction was made to Jacobs and Carmichael's (hereafter J&C) incorrect specification of the exposure variable. The presence of black mayors continued to be noncontributory when we used a larger sample of cities and more recent data (see Kaminski & Stucky, 2009). Jacobs (this issue) critiques our analysis on methodological and theoretical grounds and presents evidence that the presence of black mayors is statistically significant when a nonlinear specification of the percentage of the population that is divorced is included in his models. In response, we first address Jacobs' theoretical critique by showing that there is, in fact, ample justification for including a measure of the racial composition of city councils. We then show that even after revising our models based on Jacobs' methodological critique we continue to find that the presence of black mayors is noncontributory, calling into question the robustness of J&C's and Jacobs' findings.

Racial Politics: Black Mayors v. Black City Councils

Jacobs argues in his reply that our original article did not provide sufficient justification for the inclusion of the percent of the city council that is Black. In J&C's article the justification for including the Black mayor variable was the argument (citing Bobo & Gilliam, 1990) that increased black political efficacy would accompany such visible evidence of black political incorporation and reduce feelings of black injustice.[1] This, in turn, would lead to fewer killings of police officers. J&C acknowledge that such an argument is unable to be tested directly using ecological data. In his comment, Jacobs claims that most people are unaware of politics and therefore would be unlikely to know the race of their city council member. In addition, he claims that our citations co-mingled the

[1] It should also be noted that Bobo and Gilliam (1990) used the General Social Survey and the unit of analysis was primary sampling units (PSU) rather than cities. In addition, the dummy variable for the Black mayor was coded as 1 when the mayor of the major city in the PSU was Black but not when the mayor of lesser cities within the PSU was Black.

effects of city councils and mayors and probably reflected the contribution of Black mayors. Therefore, the inclusion of the black city council variable was not justified.

In retrospect, one might read the language of our justification in our original article as co-mingling citations of the effects of Black mayors and Black city council on politics, policy, and criminal justice. Here, we briefly clarify these issues. One set of studies that we pointed to in the original article considered the relationship between racial political representation and racial representation patterns in municipal employees. Several studies have *separately* included both the race of the mayor and the percentage of the city council members who are black in their explanations of racial variation in municipal employment (e.g. Mladenka, 1989, 1991; Kerr & Mladenka, 1994). Though not unequivocal, these studies suggest that greater Black city council representation is associated with increased black municipal employment, particularly protective service employment, which would include police (Dye & Renick, 1981, Mladenka, 1989, 1991). Indeed, Kerr and Mldenka (1994) conclude that racial composition of the city council is more important than the race of the mayor in their pooled cross sectional time series analyses of municipal employment. One could argue that the racial composition of the police force would be a highly visible indicator of racial incorporation to citizens irrespective of their general political knowledge. Therefore, if black city council representation produces greater black municipal employment, black political efficacy could be enhanced or feelings that the police are an occupying force (especially in large cities with high levels of segregation) could be reduced. Such an atmosphere could be associated with fewer killings of police by blacks.

Though no studies we are aware of directly address the question of whether black political efficacy is related to black city council representation as the Bobo and Gilliam study does for black mayors, one study does indirectly address this question. Bledsoe (1986) finds that black political efficacy is higher in cities with district city council elections than those with at-large (where voters

from all over the city choose council members) elections. He argues that this is likely due to the increased ability to have black city council members elected in district cities. Indeed, many studies have shown that black city council representation is higher in cities with district-based elections (e.g. Welch, 1988, 1990).

Other criminal justice studies have also independently included the racial composition of the city council. Shihadeh and Flynn (1996) included the racial composition of the city council in their study using similar arguments to those we included in our original article. In a forthcoming article, Stucky finds that the racial composition of the city council and the race of the mayor separately (but conditionally depending on the racial composition of the city) influence black violent crime arrest rates in 100 cities in 1970, 1980, and 1990. Thus, there is ample theoretical justification for the separate inclusion of both the racial composition of the city council and the race of the mayor.

Nonlinear Specification of Percent Divorced

In his comment, Jacobs points out that "…K&S do not replicate any of our seven 'main' comprehensive models. We found evidence that an important social disorganization variable—percent divorced—had a significant nonlinear relationship with officers killed. But K&S inexplicably omit our or another specification that captures this nonlinear relationship" (pp. 2-3). First, we never claimed to conduct a full replication of J&C and, in fact, we stated specifically that we conducted a *limited* replication of J&C (K&S, 2009, p. 17, note 3) and extension. Second, it is unclear to us, despite J&C's arguments, why they went to such great lengths to specify a nonlinear relationship for percent divorced using dummy variable coding when the black mayor variable was statistically significant when percent divorced was entered linearly in an earlier model. In his comment, Jacobs states that it "…follows that when the K&S omission [to enter percent divorced nonlinearly] is corrected the black mayor dummy remains highly statistically significant in all main models in Table 1 that include dummies to capture the nonlinear relationship between divorce rates

and officers killed" (p. 4). However, as shown in Table 2 (p. 1236) of J&C's original paper, this was not the case. As Models 2 and 3 in their Table 2 show, the black mayor variable was statistically significant when percent divorced was entered linearly and J&C presumably *could not have known at the time* that the contribution of the presence of black mayors completely depended on the inclusion of a nonlinear specification of percent divorced once their misspecification of the exposure variable was corrected. We were unaware of this unique dependency as well, and when J&C's black mayor variable became statistically insignificant after we corrected their misspecification of the exposure variable (K&S, Table 1, Model 2), we simply presumed it became noncontributory due to the exposure variable correction and never suspected that the effect of the black mayor variable would be so sensitive to a nonlinear specification of percent divorced. This is a second reason we did not include a nonlinear specification for percent divorced.[2]

According to J&C, the rationale for using the dummy variable coding was that "[t]he residuals suggest that nonlinear effects remain and the first three models do not pass the link test for specification error (Pregibon 1980). In model 4 we test a solution by retaining the divorce rate after we add dummy variables scored 1 depending on where a city placed in the five quintiles on the percentage divorced" (p. 1235).[3] However, all of J&C's tests and diagnostics were based on misspecified models (due to their misspecification of the exposure variable), and thus Jacobs' *subsequent* discovery that that the black mayor effect, in fact, depends on the inclusion of a nonlinear specification of percent divorced is based on flawed analyses.[4]

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[2] We also stated that the dataset we received did not include all the variables necessary to replicate all of J&C's models (K&S, 2009:17, note 3). This was an oversight on our part.

[3] Oddly, when we exactly replicate those models using their incorrect exposure command, Models 2 and 3 *pass* the link test for misspecification (b = -.079; p = .051 and b = -.062; p = .108, respectively). We also point out that formally, the link is not a test of the misspecification of explanatory variables; instead, it is a test of the misspecification of the dependent variable (StataCorp, 2009, pp. 849-851).

[4] Reestimating J&C's first three models using the correct offset command shows that Models 2 and 3 in their Table 2 do not come close to failing the link test (b = -.032; p = .377 and b = -.022; p = .515, respectively).

Regarding the nonlinear specification of the percent divorced variable, J&C stated that "[t]his control variable is not of theoretical interest, so we maximize its explanatory power by using dummy coding without justifying the functional form of this relationship" (p. 1232). Thus, the significance of the effect of the black mayor variable in Jacobs' analysis depended on an arbitrary coding of percent divorced. It is arbitrary in that the functional form is without theoretical justification. Instead, J&C based its functional form on the maximization of explanatory power, which capitalizes on chance.[5] This fact, plus that that their justification for dummy coding percent divorced was based on misspecified models to begin with, indicates that the contribution of the presence of black mayors is based more on "accident" than on design. As we will show again, the relationship between black mayors and killings of police appears not to be particularly robust.

Addressing Additional Critiques

J&C included the presence of black mayors in 1980 to predict murders of police aggregated over the years 1981 – 1990 and Jacobs correctly points out that most of our explanatory variables are based on 1989 or 1990 data while our dependent variable consists of police officers murdered aggregated for the years 1985 – 1995. Although this precluded establishment of temporal ordering, we never presumed to be estimating anything other than a correlational model. As such, we thought it best to anchor the independents in the middle of the distribution of the dependent variable, though we recognize the validity of Jacobs' point and revise the model accordingly to test whether or not it makes a difference.

Jacobs (p. 7) implies that his single-year measure of the presence of black mayor is superior to one that captures more fully the actual number of years a black mayor is in office. However, as

[5] We also find it odd that J&C chose to focus on dummy variable coding only for percent divorced, which was not of theoretical interest, particularly when theoretical justification exists for including nonlinear effects for other important variables in their models that were entered linearly (see, e.g., K&S, 2009:10-11).

we pointed out in our original article (K&S, 2009, p. 11), mayoral terms can vary substantially, lasting a year, several years, or a decade or more. J&C's use of a single-year dummy indicator fails to capture this variability, casting serious doubt on the validity of such a simplistic measure. Further, J&C's single-year measure is unable to capture the situation in which a black mayor in 1980 was followed by a change to a nonblack mayor (or vice versa) during the decade over which their dependent variable is measured. Oddly, J&C and Jacobs are silent on this issue and we encourage researchers to move beyond the use of simplistic single-year dichotomous measures of the presence of a black mayor.

Jacobs indicates that "…K&S only include one dummy variable for the Northeast; it would be more convincing if their findings persisted after they entered three dummies to capture the effects of all four Census regions as we did" (p. 7). We refer readers to note 13 of our original paper where we stated that "[a]dditional analyses showed that the effect of city location in the South on police homicides was no different from city location in the West or Midwest; hence, our decision to contrast these regions with the Northeast." Nevertheless, we include them in analyses below to demonstrate that it makes no difference regarding the lack of the contribution of the black mayor variable.

As further evidence for the significance of black mayors, Jacobs (p. 7) references a paper by Kent (2010) that is forthcoming in *Homicide Studies*. According to Jacobs, Kent employs a panel model based on 1980, 1990, and 2000 data and finds that cities with black mayors had fewer police killings. Although we have not seen the paper by Kent, we agree that panel models offer several important advantages over cross sectional models and we look forward to seeing Kent's results in print. However, if Kent's manuscript is based on her dissertation in which she analyzed killings of police using a panel model design, additional work may be required before we can conclude that the presence of black mayors reduces police killings. This is because the Law Enforcement Officers

Killed and Assaulted (LEOKA) electronic data available from the University of Michigan's Inter-University Consortium for Political and Social Research that Kent relied on for her analysis (Kent, 2005, p. 98) contained some large errors in the counts of officers killed. Kaminski inadvertently discovered these errors during a cursory review of the electronic data.[6] For example, the ICPSR version of the LEOKA data reports 17 San Francisco officers killed in November of 1982 alone, whereas other electronic data that Kaminski obtained upon special request directly from the FBI as well as the FBI's hard copy 1982 LEOKA report indicate only one officer killed in San Francisco that year. As another example, the ICPSR version of the data indicate that 12 law enforcement officers were murdered in Oklahoma City in April 1995 (the same month the Alfred P. Murrah Federal Building was bombed), but the hardcopy LEOKA report does not mention the deaths of any *local* law enforcement officers in that month.

Kent aggregated killings of police for the years 1981-82, 1991-92 and 2001-02 and unless the error was noticed and corrected, the first wave of data includes the erroneous San Francisco count. This would almost certainly affect her estimates, especially since her dependent variable included very few murders (31, 20, and 9 in each wave of data, respectively) (Kent, 2005, p. 107). In any case, the implications of these and other likely errors in the ICPSR versions of the LEOKA data are unknown and additional analyses using corrected data will be required before Kent's findings regarding the effect of the presence of black mayors can be confirmed.[7]

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[6] Kaminski reported these errors to both the ICPSR and the FBI several months ago, though what additional errors have been found and corrected is unknown.

[7] We should also mention that we were unable to determine the source of J&C's dependent variable (we only know they say they use counts of local police killed (see p. 1231). We caution that the counts in the electronic versions of the LEOKA data from ICPSR apparently include local, state *and* federal law enforcement officers murdered within local jurisdictions (e.g., federal officers killed in the 1995 bombing of the Alfred P. Murrah Federal Building in Oklahoma). Unless researchers take steps to exclude state and federal officers killed in cities, they may be included in the dependent variable. We argue they should not be included, given their very different functions, not to mention that the exposure variables used by us, J&C, Jacobs, and Kent are based on the number of sworn officers in municipal police departments.

On page 4 of Jacobs' comment, he states "[a]nd the R^2 in K&S's Model 2 in their Table 1 that supposedly replicates our "main" model is .086, yet our nonlinear specification always produces greater explanatory power." It is interesting to observe that when Jacobs reestimated the models from J&C using the corrected exposure variable, the pseudo-R^2 values dropped precipitously from approximately .470 to between .136 and .155 (excluding Jacobs' Model 7 in which he includes the exposure variable on the right-hand side of the equation and greatly inflates the R^2). While higher than our R^2 value of .086, Jacobs' R^2 values are nevertheless very low suggesting that J&C's and Jacobs' models (as well as ours) do not provide a very good fit to the data. Additional analyses incorporating other important explanatory variables are in order.

Additional Regression Analyses

Jacobs' comment focuses on four methodological limitations of our analysis; entering percent divorced linearly instead of nonlinearly, entering a single regional dummy instead of three regional dummies, measuring the independents in 1989/1990 while the dependent variable spanned the years 1985-1995, and generally failing to replicate his "main" regression models.

In response, Models 1 and 2 in Table 1 test whether adding percent divorced nonlinearly and the additional regional dummy variables change our original findings regarding the insignificance of the presence of black mayors for murders of police 1985-1995 (K&S, 2009, Table 3, Model 1). To address Jacobs' concern with temporal ordering, these models are then reestimated using a dependent variable aggregated for the years 1991-2000 with independents measured at 1989/1990 (Models 3 and 4 in Table 1). Table 2 presents seven regression models that replicate J&C's "main" models using the outcome for 1991-2000.

Table 1 about here

Model 1 in Table 1 estimates K&S's original model (Model 1 in Table 3) replacing the regional dummy indicator Northeast with the three regional dummy variables South, West and Midwest and replacing the linear measure of percent divorced with dummy indicators of the second through fifth quintiles. Model 2 in Table 1 replaces the dummy indicators of percent divorced with percent divorced and its square as an additional test for nonlinear effects. As can be seen, these modifications do not change our original conclusion that the presence of black mayors is unrelated to killings of police for the years 1985-1995. Interestingly, the average number of black city council members retains it statistical significance in both models.

Models 3 and 4 in Table 1 repeat the analysis using the number of police killed for the years 1991-2000. Again, the black mayor variable is noncontributory. Although the black council variable is insignificant when using Jacobs' dummy coding of percent divorced, it retains its significance when percent divorced and its square is used instead (Model 4).

Table 2 about here

Table 2 presents a series of models that replicate J&C's "main" models, with the exceptions that model 4 does not include crowding and we include four dummies based on quintiles of percent divorced instead of three (we also tested J&C's version using three dummies but conclusions were unchanged). Again, the presence of black mayors is not statistically significant at the conventional p = .05 level (1-tailed tests) in any model, though several p-values are less than .10. However, when we add the average number of black city council members to these models (results not shown), the presence of black mayors is not nearly statistically significant even at the .10 level.

Conclusions

We agree with Jacobs' statement that "…the corrected results presented here show that either the dummy or quadratic nonlinear specifications they ignore are necessary to produce accurate findings" (p. 8). However, our view is that this is the precise problem with J&C's and Jacobs' findings regarding the effect of the presence of black mayors. J&C justified the inclusion of a nonlinear specification of percent divorced based on an arbitrary maximization of its explanatory power and not based on Jacobs' *ex post facto* argument that it is necessary to produce "correct results," i.e., to produce a statistically significant effect for the presence of black mayors (since black mayors was also significant when the linear specification of percent divorced was included in J&C's models). J&C's nonlinear percent divorced variable is further arbitrary since its inclusion was based on link tests and an analysis of residuals from a misspecified regression model to begin with. Our additional analyses addressing the methodological critiques raised in Jacobs' comment confirmed our original conclusions. Thus, the evidence to date suggests the effect of the black mayor variable is not robust to model specification or data employed, which was the point of our original article. In addition to using more sophisticated analytic techniques such as panel or other models, future testing using improved black mayor measures and additional explanatory variables beyond those employed by J&C and K&S should help inform this debate.

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Table 1. K&S Poisson Regression Models of Police Homicides Adding Regions and Nonlinear Terms for Percentage Divorced

	Y = 1985 - 1995		Y = 1991 - 2000	
	Model 1	Model 2	Model 3	Model 4
Variable	B	B	B	B
South	1.597	1.560†	2.534***	1.560†
West	1.440	1.561	2.697***	1.561
Midwest	1.253	1.254	2.138**	1.254
Percent black	1.014*	1.015*	1.012**	1.015*
Black change	0.980	0.986	0.991	0.986
B/W income	2.850	2.574	0.745	2.574†
Violent crime rate	1.429	1.355†	1.238	1.355†
Population structure	0.960	0.956	0.921**	0.956
Economic conditions	0.987	0.994	0.973	0.994
Racial segregation	1.094	1.160	1.203	1.160
Black mayor	0.984	0.970	1.084	0.970
Black council	0.958*	0.956*	0.971	0.956*
Percent divorced Q2	1.067†	----	0.550*	----
Percent divorced Q3	1.378	----	0.638†	----
Percent divorced Q4	0.912	----	0.531**	----
Percent divorced Q5	0.892	----	0.647†	----
Percent divorced	----	1.609	----	1.610
Percent divorced sq.	----	0.975	----	0.975
Black police	0.872	0.860	0.757	0.860
Justifiable killings	0.998	0.998	0.679†	0.998
Constant	-10.279***	-11.930***	-8.607***	-11.930***
McFadden's Pseudo R^2	.077	.073	.109	.073

Notes: † ≤ .10, * ≤ .05, ** ≤ .01, *** ≤ .001 (one-tailed tests based on robust standard errors, two-tailed tests used for Segregation); *B*s are incidence rate ratios (i.e., exponentiated regression coefficients); the number of sworn field officers entered as the offset to control for unequal exposure; constants are not exponentiated.

Table 2. Poisson Regression Models of Police Homicides 1991-2000 Using J&C's Specifications

Variable	Model 1 B	Model 2 B	Model 3 B	Model 4 B	Model 5 B	Model 6 B	Model 7 B
Percent black	1.009**	1.019*	1.012	1.019*	1.015†	1.012	1.019*
B/W income	0.524	0.552	0.757	0.553	0.942	1.019	0.528
Ln violent crime rate	1.073	1.076	----	1.082	1.194	1.086	1.072
Population	0.998†	0.999†	0.998	0.999	0.998	0.998	0.999
Population^2	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Segregation	0.748	0.667	0.958	0.680	1.704	1.121	0.716
Black mayor 1990	1.298†	1.347†	1.324	1.349†	1.388†	1.363†	1.353†
% divorced	1.038	----	----	----	----	----	----
% divorced Q2	----	0.979	1.056	0.976	0.589†	0.959	0.981
% divorced Q3	----	1.095	1.089	1.099	0.660	1.067	1.138
% divorced Q4	----	1.083	1.064	1.086	0.627	1.039	1.099
% divorced Q5	----	1.234	1.213	1.235	0.662	1.148	1.260
% black x pop > 25000	----	0.991†	0.992†	0.991†	0.992†	0.991†	0.991†
Growth in % black	----	0.980	0.986	0.980	1.001	0.995	0.980
Ln murder rate	----	----	1.410†	----	----	----	----
Ln robbery rate	----	----	0.778	----	----	----	----
Ln percent poverty	----	----	----	0.970	----	----	----
South	----	----	----	----	0.957	----	----
Midwest	----	----	----	----	0.756	----	----
Northeast	----	----	----	----	0.344*	----	----
% white fem-headed fam	----	----	----	----	----	0.922	----
% black fem-headed fam	----	----	----	----	----	0.997	----
% unemployed	----	----	----	----	----	1.052	----
Justifiable killings	----	----	----	----	----	----	0.881
Constant	-7.369***	-7.159***	-6.193***	-7.137***	-8.103***	-7.221***	-7.330***
McFadden's Pseudo R^2	.067	.073	.078	.073	.092	.075	.075

Notes: † ≤ .10, * ≤ .05, ** ≤ .01, *** ≤ .001 (one-tailed tests based on robust standard errors, two-tailed tests used for Segregation); *B*s are incidence rate ratios (i.e., exponentiated regression coefficients); the number of sworn field officers entered as the offset to control for unequal exposure; constants are not exponentiated.

Model key:

Model 1 = J&C Table 2, Model 2
Model 2 = J&C Table 2, Model 5
Model 3 = J&C Table 3, Model 1
Model 4 = J&C Table 3, Model 2 (excluding crowding)
Model 5 = J&C Table 3, Model 3
Model 6 = J&C Table 3, Model 4
Model 7 = J&C Table 3, Model 5