



Roles of neighborhood race and status in the middle stages of juror selection

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Abstract

This study investigated impacts of neighborhood race, status, and stability on the likelihood that summoned citizens would appear at the courthouse for jury duty using a full year of geocoded summoning data from Philadelphia, Pennsylvania ($n = 256,204$). A theoretical model based on jury selection models and the sociology of settlement patterns connected potential juror yield or turnout with neighborhood stability, and racial and status composition. Multilevel models using census block groups as neighborhoods and controlling for spatial autocorrelation found, as predicted, that yield varied significantly across neighborhoods, and was lower in lower status neighborhoods, less stable neighborhoods, more predominantly Asian neighborhoods, and more predominantly Hispanic neighborhoods. As predicted by work on neighborhood integration, effects of African–American racial composition depended on the stage of neighborhood integration. Overall, the net effect of increasing African–American neighborhood racial composition was to increase yield. A significant spatial lag effect suggested localized dynamics operating beyond neighborhood boundaries.

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Introduction

Say a typical neighbor, living within a couple of blocks of your own home, is summoned for jury duty. What is the probability that he or she will appear at the courthouse on the appointed day of service? Will that probability depend on the type of neighborhood you live in? If ten of your neighbors are summoned, what fraction of them will appear? If the probability of one neighbor showing up, or the fraction of ten neighbors showing up, does vary across neighborhoods, will that outcome depend on your immediate neighborhood's socioeconomic standing or racial composition? These

questions are investigated using a full year of summoning data from Pennsylvania's largest and most racially diverse county—Philadelphia. The outcome was potential juror yield: the probability of one summoned potential juror, or the fraction of several summoned potential jurors, appearing at the courthouse as requested on service day.

An ecological model drawing on individual-level studies about jurors and sociological work on race and settlement patterns predicted the impacts of neighborhood race and class on potential juror yield.¹ This model was an example of a growing number of contextual investigations of criminal justice processes like police use of force (Terrill & Reisig, 2003) and related responses to those processes (Reisig & Parks, 2000). In addition to its theoretical import, the model developed had some policy interest because it addressed the question: does underrepresentation of potential jurors along race and/or class lines increase in the jury selection

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processes between the summoning and the courthouse appearance?

Selection of potential jurors can be divided into three stages: early, middle, and late. In the early stages, master lists for identifying potential jurors are constructed, updated, and used. The middle stages span what happens between the summons for service being issued to potential jurors and their appearing, or not, at the courthouse on service day. The final stages focus on selecting actual jurors from those present at the courthouse.

The material immediately below briefly outlines some major concerns about juror selection in the early and final stages. The following section more closely examines work specific to the middle stages of potential juror selection. That work is then combined with social psychological and sociological work on, respectively, confidence in the criminal justice system and settlement patterns to craft a theoretical model describing ecological connections between potential juror yield and fabric of the immediate neighborhood.

Early and later stages of potential juror selection

Judicial reform efforts to increase jury representativeness have made substantial strides in the last four decades (Munsterman, 1996). Concerns continue, nonetheless, about what happens in the earliest stages of juror selection when source lists are used to construct master juror lists, and how those procedures affect both racial and class composition (Bueker, 1997; Dunham, Alpert, & Connors, 1986; Kairys, Kadane, & Lebozky, 1977; Knack, 1993). Questions also arise about how to use the lists and the effects of different uses on representativeness along race and class lines (Fukurai, Butler, & Krooth, 1991a, 1991b; Munsterman & Munsterman, 1986).

Concerns about representativeness appear also in the last stage in juror selection, voir dire, when specific jurors are selected from the jury panel. The Supreme Court's *Batson v. Kentucky* (1986) decision extended equal protection principles to preemptory challenges (challenges without cause) when selecting the jury pool. The court held that the equal protection clause protected defendants against removing potential jurors solely on account of their race, and against presuming that race linked to juror qualifications.² Since *Batson*, the Court has expanded its ruling to defense as well as prosecuting attorneys, to civil cases, and to situations where defendant and juror race are different (Leipold, 1998). Nonetheless, one study of capital murder cases in Philadelphia subsequent to *Batson* (Baldus, Woodworth, Zuckerman, Weiner, & Broffitt, 2001) found that

“discrimination is widespread” and *Batson* has had only a “marginal impact” (Baldus et al., 2001, p. 10; but cf. Rose, 1999). Given continuing concerns about racial and perhaps income underrepresentation in the earliest and latest stages of selection, it is no surprise that the end product (the sitting juries) are often found to dramatically underrepresent citizens of color (e.g., Karns, 2001).³ In the middle stages of potential juror selection, the key question is: regardless of how or how much underrepresentation is introduced in the early and/or later stages, does it increase during these middle stages?

Middle stages of juror selection

The multi-element, middle stages of juror selection span the time between being summoned and appearing at the courthouse. Hurdles to appearing are several. (1) The summons must reach the intended juror and not be returned as undeliverable. From 8 percent to 12 percent of summons are returned as undeliverable (Boatright, 1999, p. 157). (2) A citizen can choose to ignore a summons for jury duty. (3) If the citizen responds, he/she may seek an excusal or a postponement. (4) Court administrators may disqualify the potential juror on any number of grounds, e.g., felony history or inability to understand English. (5) The potential juror must arrange, as needed, transportation, child or elder care, and time off work to get to the courthouse.

The middle stages of jury selection are conceptually distinct because both the summoning institution and the summoned themselves jointly shape the outcome of these processes. This makes this stage of inherent theoretical interest. Whatever biases or limitations inhere in those materials serving as the starting lists for these middle stages, the key question is whether racial and/or class underrepresentation are subsequently increased as these middle stages unfold.

Some have claimed that all stages of jury selection processes, including these middle stages, introduce racial biases (Alker, Hosticka, & Mitchell, 1976; Benokraitis, 1982; Fukurai et al., 1991a, 1991b). The empirical work, however, has not consistently supported that point. On the one hand, some studies suggested instead that intervening factors, such as attitudes, availability, and hardships, might mediate some of these race and class impacts (Boatright, 1999; Fukurai, 1996, 1997, 1999; Fukurai, Butler, & Krooth, 1993; Fukurai & Davies, 1997; Losh & Boatright, 2002; Losh, Wasserman, & Wasserman, 2000). On the other hand, however, some studies found no race differences in attitudes toward jury service (Boatright, 1999).

Making it even somewhat more complex are two further points. First, the links between race, court service, and court attitudes may vary by ethnic group in question (Brooks & Jeon-Slaughter, 2001; Rottman, Hansen, Mott, & Grimes, 2003) and by status (Brooks & Jeon-Slaughter, 2001). Second, impacts of race on attitudes diminish, perhaps to the point of irrelevance, as more indicators of procedural justice are included (Flanagan & Longmire, 1996, p. 66; Rottman et al., 2003, p. 13).

In sum, the following points about the middle stages of potential juror selection seem warranted by the individual-level work to date. (1) Effects of race sometimes appear but may be contingent upon the racial group in question, and/or on class. (2) As a group, these studies did suggest that including attitudinal variables, hardships surrounding serving, and procedural justice indicators do reduce impacts of race on serving. (3) These other factors, however, may not *completely* mediate the impact of race thereby making race nonsignificant. (4) Effects of class do appear in some studies, and may, according to some, be as fundamental to serving as race, if not more so.

Current focus

The current study sought to advance knowledge about the middle stages of potential juror selection in the following ways. (1) Attention was turned to context, more specifically, the racial and status composition of summoned jurors' neighborhoods. This contextual focus provided a solid theoretical grounding for making more specific predictions about why race mattered in different ways for different ethnic groups. The earlier individual-level work suggested that effects of race depended on the group in question, without theoretically elaborating. The current work, focusing on theories about settlement patterns and assimilation, made specific predictions about how different racial contexts mattered. (2) Cross-sectional studies make it exceptionally difficult to untangle causal direction when attitudes are investigated, even if prior service is also queried. This work sought to present a clearer causal ordering in a contextual framework. Neighborhood demographic structure was expected to influence yield or turnout; this structure cannot itself be affected by yield. (3) Most studies of jurors and race considered only African–American representation. Researchers in this area have called for attention to Asians and Hispanics (Fukurai, 2001). This study *simultaneously* considered the impact of African–American, Hispanic, and Asian racial composition on potential juror yield. (4) None of the

earlier studies applied multilevel models, which control for a host of problems with clustered data (Snijders & Bosker, 1999). This study did. (5) None of the earlier studies controlled for spatially autocorrelated outcomes, which are also potentially problematic (Cliff & Ord, 1973). This study did.

Racial composition

First, turning to racial composition, an increasing proportion of populations of color in a neighborhood could translate into decreased willingness to serve on juries. This decreased willingness could translate into failures to respond to a jury summons, or more vigorous efforts to have jury duty postponed or excused.

Such a connection might be driven by a compositional effect, or by ecological dynamics. Thinking first about the former, separate from race-linked socioeconomic status (SES) issues, confidence in the criminal justice system or its comprehensibility could be lower and could translate into lower yields in neighborhoods where populations of color are more predominant (Boatright, 2001; Flanagan & Longmire, 1996; Henderson, Cullen, Browning, & Kopache, 1997; Tuch & Weitzer, 1997; Tyler, 1988, 1990). Turning to ecological dynamics, police conduct their work differently in different neighborhoods depending on both neighborhood crime rates and racial composition (Klinger, 1997; Simon & Burns, 1997; Smith, 1986). Although the processes underlying these differences are complex and contingent, African–Americans as compared to Whites do report seeing their neighbors treated less respectfully by police (Tyler, Boeckmann, Smith, & Huo, 1997) and this translates into weaker support for institutions in the criminal justice system (Tyler, 2000). Thus, in more predominantly African–American neighborhoods potential juror yield may be lower. The work to date has not as clearly addressed Hispanic and Asian populations of color, but comparable connections are at least plausible (Bourgois, 1996).

To frame ecological rather than compositional effects for specific racial groups, two streams of sociological work on integration and settlement patterns of African–Americans versus Hispanics and Asians prove relevant. Neighborhood work on integration and segregation of African–Americans has separated out three types of neighborhoods: those with few African–Americans (proportionally), those with a middling amount, and those predominantly African–American. The latter locations, urban and perhaps older suburban locations where African–Americans are at least two-thirds to three-quarters of the residents, are likely to have been spatially segregated for a considerable period. Therefore, in

neighborhoods almost exclusively African–American compared to those where African–Americans are just beginning to predominate, one sees not only more poverty (Massey & Denton, 1993), but also probably more alienation from the criminal justice system due to hyper-segregation and general isolation (Wilson, 1996). In this group, an increasing proportion of African–Americans in the neighborhood should link to decreasing potential juror yield.

Turning to neighborhoods just beginning to become African–American, different dynamics may be relevant. Whites in these neighborhoods are likely to believe that increasing proportions of African–Americans signal declining neighborhood conditions and deterioration in local public amenities such as schools and safety (Chiricos, McEntire, & Gertz, 2001; Ellen, 2000). If so, compared to neighborhoods where there are no or almost no African–Americans, commitment to public institutions, like courts, should be lower among the local Whites. Thus, in this set of neighborhoods, as the proportion of African–American increases yield should decline.

Finally, large, older, urban cores often contain substantial numbers of racially integrated neighborhoods where African–American and White residents mix. Some of these are on the way to resegregating African–American, but many remain stably integrated over an extended time (Charles, 2003). In these stable locations, African–Americans and Whites often work together to improve neighborhood quality, focusing on public institutions like local schools (Ellen, 2000). That commitment may carry over to civic participation in jury duty. Given shared high levels of public commitment in integrated neighborhoods, there may be no *negative* impact of increasing predominance of African–Americans on yield when different integrated neighborhoods are compared.

Turning to predictions for Asian and Hispanic neighborhoods, the shape of this impact on yield may be different because the structural dynamics driving the segregation patterns of Hispanics and Asians differ from those related to African–Americans. Dynamics driving African–American segregation depend on *place stratification* processes, while those for Asians and Hispanics may arise largely from *spatial assimilation* and acculturation-linked processes (Charles, 2003). Stated differently, African–American segregation patterns arise from “the persistence of prejudice and discrimination,” whereas Asian and White Hispanic patterns are class and acculturation linked, and will weaken as those groups become better integrated and attain higher status (Charles, 2003, p. 170). Therefore, for Hispanic and Asians, a *higher* portion of that group making up the

neighborhood reflects a *lower* degree of acculturation; i.e., residents have accumulated less “time in the United States and [less] English language fluency” (Charles, 2003, p. 177). Neighborhoods where one finds a higher portion Asian or Hispanic contain more recent arrivals because of enclavization processes among recent immigrants (Portes & Manning, 1986). Members of these groups can migrate outward more easily over time as socioeconomic status and language skills improve than can African–Americans. Therefore the portion Asian or Hispanic in a neighborhood should have a monotonic, negative impact on potential juror yield.

Class

The model anticipates a positive relationship between socioeconomic status and yield. Compositional, social psychological, or ecological processes may underlie the connection (Flanagan & Longmire, 1996; Fukurai, 1996; but cf. Boatright, 1999). These may or may not be mediated by class-linked levels of service received (Ackerman et al., 2001; Crenson, 1983; Logan & Molotch, 1987; Scaglion & Condon, 1980).⁴

Stability

Deliverability of summons depends on the jurisdiction's list updating processes and neighborhood stability (Losh et al., 2000, p. 306). Controlling for neighborhood stability in effect controls substantially, although probably not completely, for summons nondeliverability as an explanation of low yield.

Age

Previous work documents curvilinear impacts of age on summons response (Boatright, 2001; Losh & Boatright, 2002). Such a relationship, through a compositional effect, also may hold at the neighborhood level. Proportion of young potential jurors in the neighborhood will be controlled.

Summary statement

The current work tested whether neighborhood status and racial composition affected potential juror yield, controlling for stability, age composition, and surrounding juror turnout patterns. Neighborhood predictors were linked to an individual-level outcome: did the summoned juror appear at the courthouse? Focusing on neighborhood racial composition allowed specific theoretical predictions about the shape of the connection between race and yield for three ethnic groups. Monotonic, depressing effects of turnout were expected for Asian and Hispanic neighborhood composition, and

effects contingent on degree of integration for African–American neighborhood composition. Higher yield was expected in higher status neighborhoods. A spatial lag variable will be added to ensure that the results reflect endogenous dynamics only.

Methods and data

Preliminary data and background

In the summer of 2001, all jury commissioners (sixty courthouses for sixty-seven counties) in the Commonwealth of Pennsylvania received a mail survey requesting, under the auspices of a Pennsylvania Supreme Court working group, copies of all jury documents such as summons and juror information questionnaires. Commissioners or lead administrators answered questions about juror volume and available information by race. Following repeated mail and telephone follow-ups, fifty-two completed surveys (86.7 percent) were returned for analysis. In *all* cases, administrative data about racial makeup of the jury master list or of summoned jurors were not available. *All* responding jurisdictions indicated if jurors were not used to make up an actual jury juror information questionnaires completed in the courthouse were destroyed at the end of the day.

Philadelphia County

Treating White Hispanics, African–Americans, Native-American/Pacific Islanders, and Asians as populations of color confirmed these populations were most likely to be found in Philadelphia.⁵ Forty-five percent of Pennsylvania's statewide population of color was concentrated in Philadelphia County. The next largest group, 12 percent of the state's population of color, was found in Allegheny County which includes Pittsburgh. Two suburbs adjoining Philadelphia, Delaware and Montgomery County, contained 5 percent each. All the remaining jurisdictions had 3 percent or less of the state's populations of color; the numbers were above 1 percent in only thirteen counties.⁶

Data request and geocoding

In January of 2002, the lead administrator and President Judge of the Philadelphia County municipal court system were contacted. The authors requested for all of calendar year 2001 the addresses of summoned jurors, and the outcomes of the request for service.⁷ The addresses of contacted potential jurors were geocoded, and then each potential juror's outcome was linked with

the attributes of the juror's residential census block group (Forde-Mazrui, 1999). The geocoding hit rate was 89 percent (see Table 1). This exceeded the minimum acceptable hit rate of 85 percent (Ratcliffe, 2004).

Dependent variable

The binary dependent variable (YIELD) indicated whether the summoned juror appeared for duty on the day requested (1) or not (0). The overall proportion turning out was 30 percent.

Multiple cases in a census block group were needed to obtain meaningful proportions on YIELD. The analyses shown below had at least three potential jurors per neighborhood and were based on 1,792 neighborhoods (see Table 1).⁸ ANOVA models via HGLM (see below) showed significant ecological variation for this outcome. Whether a summoned potential juror did turn out for service *did* vary by neighborhood. Results also showed substantial within-neighborhood, between-neighbor consistency on yield (reliability = .78).

Predictor variables

All demographic indicators were based on 2000 census block group data. Table 2 provides descriptive information. A four-item *status* index (Cronbach's alpha = .79) averaged after z-scoring: median owner occupied house value; median household income; percent of the population with a four-year college degree or better; and percent of the population not in poverty. A two-item *stability* index (Cronbach's alpha = .79) averaged percent of owner occupied households and percent of occupied housing units occupied by the same household five years earlier. For *age*, percent of the adult population in the neighborhood between eighteen and twenty-nine was included since it seemed (Boatright, 2001) to be the one age group most consistently underrepresented.⁹

For *race*, the 2000 percentages of the adult population African–American, Asian, and Hispanic were included for each neighborhood. Given the theoretical expectation described above for African–American racial composition, the cubic transformation was applied to this variable, allowing the two expected "curves" in the relationship with the outcome.¹⁰ Percentages Hispanic and Asian were transformed to reduce skewness and reduce impacts of outliers.^{11,12}

To control for *spatial autocorrelation* and insure that the final coefficients reflected only endogenous processes, a spatially lagged outcome variable was introduced (Cliff & Ord, 1973), based on the average yield in

Table 1
Potential jurors summoned and turnout (yield) in Philadelphia, 2001

<i>Descriptives</i>	
Original N of contacted potential jurors	287,558
Geocoded and outcome known: N	256,204
Geocoded and outcome known: percent	89.10%
N yield=0 (did not appear for service)	179,296
N yield=1 (did appear for service)	76,908
Percent yield=1	30.02%
<i>Number of neighborhoods with:</i>	
>=three summoned and geocoded/neighborhood	1,792
>=six summoned and geocoded/neighborhood	1,786
>=nine summoned and geocoded/neighborhood	1,780
<i>Outcome variance decomposition</i>	
Level 2 variance	0.172
<i>Within-neighborhood agreement</i>	
Reliability	0.78
<i>Statistical test of between-neighborhood variance</i>	
Chi square	9,567.01
df	1,791
p<	.001
Statistically significant?	Yes
γ 00	-0.87
Odds (yield = 1/yield = 0)	0.417

Note: N geocoded and outcome known excluded cases where service was postponed. Statistical tests are from two-level, hierarchical generalized linear model for binary outcome. Neighborhood defined as the census block group.

immediately surrounding neighborhoods. Whether this variable had a significant impact was also of theoretical interest. If it was, it would suggest a broader ecological patterning of outcome dynamics at a larger level of spatial aggregation.

Model choice

Given the binary outcome and clustering of citizens within neighborhoods, generalized hierarchical linear models were used (HGLM) (Raudenbush & Bryk, 2002). With an individual-level outcome and only neighborhood level predictors, the means-as-outcomes regression (MAOR) sub-model in HGLM was appropriate. These multilevel models recognized when different potential jurors lived in the same or different neighborhoods, and how average yield in that locale compared to the jurisdiction-wide average. Multilevel models understood how the observations were arranged both within and between groups of neighbors, thus, they placed the neighborhood-to-neighborhood differences in context.¹³ This was the only form of analysis that fully and appropriately considered both the within and between group features of the data.

Summoned but outcome not known

In Philadelphia County, approved jurors who did not receive an excuse but who failed to show on the first date requested were labeled “postponed” and automatically rescheduled for a jury duty some eight to twelve weeks hence.¹⁴ Only if an approved juror failed to appear on the second scheduled date was he/she classified as a summoned juror who failed to appear. The analysis was completed with postponed jurors excluded.¹⁵ In essence, the ultimate outcome of the request that they appear was not known because the summoning process continued past the cutoff date.

Sequence of models

The following sequence of models was completed subsequent to the ANOVA via HGLM. Models A, B, and C controlled for age composition and investigated effects of Asian, Hispanic, and African–American neighborhood racial composition, respectively. This provided an age-controlled estimate of each separate racial composition impact. Model D looked at the impacts of all three racial compositions jointly, controlling for age structure. Model E added impacts of status and stability. Model E-spatial added the spatial lag control variable. Thus, the results in the last model reflected only endogenous dynamics.¹⁶

Results

Racial composition

Asian

After controlling for age, percent Asian had a significant (B = -.03; p < .001; Table 3, Model A) negative impact on average yield. The bivariate, neighborhood-level scatterplot with the un-transformed race variable showed yield started out at around 30 percent for neighborhoods with no appreciable Asian population.¹⁷ From there, it decreased steadily to an average yield of around 15 percent for neighborhoods around 60 percent Asian. In a handful of almost completely Asian neighborhoods, the average yield was around 10 to 12 percent. The shape of this relationship was consistent with Charles’ (2003) discussion of settlement patterns and acculturation.

When all three race variables entered the model (Model D), the Asian composition impact remained significant. Controlling for status and stability together, and for other racial groups (Model E) reduced the coefficient somewhat in size from Model D. Controlling

Table 2
Philadelphia 2000 neighborhood predictors and component variables

	Mean	Median	Sd	Min.	Max.
<i>Status</i>					
Median owner occupied house value	–	\$51,050	\$63,061	\$0	\$1,000,001
Median household income	–	\$29,146	\$16,991	\$0	\$200,001
% adult population: four-year college degree or better	16	10	18	0	100
100- % of population below poverty line	75	79	18	0	100
Status index	0.01	–0.05	0.79	–1.95	6.96
<i>Stability</i>					
% owner-occupied housing units	60	63	23	0	100
% housing units same occupant last five years	60	63	18	0	100
Stability index	60.36	62.73	18.29	0.00	100
<i>Age</i>					
% eighteen to twenty-nine	18	16	11	0	100
% > fifty	28	26	12	0	100
<i>Race (of population in percent)</i>					
African–American	46.7	37.1	39.9	0.0	100
Hispanic	8.3	2.0	16.8	0.0	100
Asian	3.7	0.0	8.2	0.0	100
African–American (transformed)	49.5	46.4	39.1	0.0	98.3
Hispanic (transformed)	350.5	4.5	1,211.0	0.0	10,000
Asian (transformed)	0.8	0.0	1.1	0.0	4.6

Note: Neighborhood defined as the census block group. Results shown after eliminating census block groups with 2000 populations of less than fifty, or more than 50 percent of population in group quarters. See text for more details on specific variables, and on transformations.

for adjoining dynamics reduced the coefficient to about half its original size (Model A), but it remained significant. In short, increasing Asian composition significantly reduced potential juror yield. The reduction in the size of its impact from Model E to E-spatial suggested there were spatially exogenous as well as endogenous processes at work.

Hispanic

Turning to Hispanic neighborhood composition, a significant impact in the expected direction emerged after controlling for age ($B = -.0002$; $p < .001$; Table 3, Model B); a higher proportion Hispanic depressed yield. The bivariate, neighborhood-level scatterplot with the un-transformed race variable showed an almost linear relationship between the two variables. In neighborhoods with no Hispanic population, average yield was around 30 percent. At around 3 to 4 percent Hispanic, average yield started decreasing steadily as proportion Hispanic increased. For neighborhoods almost exclusively Hispanic, average yield was around 8 percent.

When estimating all three race effects simultaneously (Model D), the effect of portion Hispanic remained significant and about the same size. Adding additional controls for status and stability (Model E) reduced the size of the effect, but it remained significant. Controlling

for spatial lag further diminished the effect, but again, it remained significant and in the expected direction. Yield was lower, after controlling for other factors, in more predominantly Hispanic neighborhoods.

African–American

The initial model examining the effect of percent African–American, after controlling for age composition, suggested increasing underrepresentation: as proportion African–American increased, yield decreased ($B = -.0007$; $p < .01$; Table 3, Model C). The neighborhood-level, bivariate scatterplot with the un-transformed race variable showed this to be a complex relationship, but one whose shape generally agreed with the foregoing theoretical discussion.

In slightly African–American neighborhoods (0 to 30 percent African–American), as this proportion increased, neighborhood average yield decreased from about 34 percent down to about 24 percent. In integrated neighborhoods (from 30 percent to 70 to 80 percent African–American), as the proportion African–American increased, average yield increased somewhat as well, rising from 24 percent up to about 31 percent. In predominantly African–American neighborhoods with over 70 to 80 percent African–American, as percent African–American increased, average yield flattened

Table 3
Hierarchical generalized linear models predicting yield

Model	A	B	C	D	E	E-spatial
Intercept	-.7307 (.0262)	-.6911 (.0251)	-.6996 (.0297)	-.5384 (.0282)	-1.1446 (.0577)	-1.1155 (.0404)
% eighteen to twenty-nine	-.0065*** (.0014)	-.0070*** (.0014)	-.0078*** (.0014)	-.0066*** (.0014)	-.0030* (.0014)	-0.0009 (.0008)
% African American			-.0007** (.0002)	-.0020*** (.0002)	.0009*** (.0002)	.0004* (.0002)
% Hispanic		-.0002*** (.00001)		-.0002*** (.00001)	-.0001*** (.00001)	-.00005*** (.000008)
% Asian	-.0344*** (.0092)			-.0703*** (.0084)	-.0513*** (.0074)	-.0145* (.0067)
Stability index					.0056*** (.0006)	.0038*** (.0004)
Status index					.2806*** (.0222)	.1193*** (.0120)
Spatial lag- yield						.8988*** (.0351)

Notes: Unstandardized coefficients, standard errors in parentheses. All results were based on CBG's with three or more cases. Status (socio-economic status) = socioeconomic standing index based on z-scored 2000 items: median owner occupied house value, median household income, percent of the population with a four-year college degree or better, percent of the population below the poverty line (reversed). Stability = stability index based on percent owner-occupied housing units, and percent of occupied housing units occupied for at least five years, both variables were from 2000 and were averaged for the index value. Higher scores indicated greater stability. Hispanic variable = percent of the population 18+ that was Hispanic, 1 added to the value, then logged, then squared. African American variable = percent of the population 18+ declaring themselves African American, a value of 1 was added, then the variable was logged, and then cubed. Asian = percent of the population that was Asian, a value of 1 was added, and then the variable was logged.

* = $p < .05$.

** = $p < .01$.

*** = $p < .001$.

out and then started to drop slightly, ending up around 28 percent average yield for almost completely African–American neighborhoods.¹⁸

After controlling for both status and stability, however, the racial composition effect was reversed and significant ($B = .0009$; $p < .001$; Table 3, Model E). Increasing African–American representation linked to higher average yield. The change in sign was due to the race-status connection.¹⁹ The race effect remained significant and in the positive direction, albeit smaller, after introducing the spatial lag control variable ($B = .0004$; $p < .05$, Model E-spatial).

Looking at the neighborhood-level, bivariate scatterplot of percent African–American and the status index showed that sign flip was not just an example of beta bounce due to multicollinearity (Gordon, 1968). Variance inflation factors and tolerance levels were acceptable. Rather, it emerged because of the nonlinear relationships between race and yield and race and status. Variations in status partialled out the race effect in slightly and predominantly African–American neighborhoods, but not in integrating African–American neighborhoods, where an increasing proportion African–American linked to slightly higher yield. In effect, what emerged after controlling for status was the positive

impact of increasing percent African–American on yield emerging largely from integrated neighborhoods.²⁰

Status

Status demonstrated a strong impact on yield in the expected direction ($B = .2806$, $p < .001$ in Model E). Average yield was higher in higher SES neighborhoods. Those from a neighborhood one standard deviation higher than another on the SES index had an average relative odds of turnout about 30 percent higher ($\exp(b) = 1.32$) after controlling for the other factors in the model. This impact remained significant, but was sharply reduced, after introducing the spatial lag control variable ($B = .1193$; $\exp(b) = 1.127$). This last point suggested some extra-neighborhood dynamics linking status and yield also were operating.

Stability

Controlling for other factors in the model, more stable neighborhoods, as expected, had higher yield ($B = .0056$, $p < .001$). For each percentage point increase in the stability index, the relative odds of turnout increasing versus decreasing went up by about

.5 percent. All else equal, a neighborhood with a homeownership rate of 75 percent and five-year tenure rate of 75 percent, compared to a neighborhood where those numbers were 25 percent, would have a relative odds of turnout about 50 percent higher. Stability remained significant but somewhat reduced after adding in the spatial lag control variable. The most plausible explanation of this result was that neighborhood stability differences drove differences in the proportions of nondeliverable summonses, which Boatright (1999) has suggested are a significant problem.

Age

As expected by the work of Boatright (2001), an increasing portion of young adults in the neighborhood linked to decreasing average yield. This significant impact was rendered nonsignificant, however, when the spatial lag control variable was added. Thus there was no *endogenous* relationship between neighborhood age structure and yield.

Spatial adjacency

Including the spatially lagged outcome variable noticeably reduced the net impacts of the three racial composition coefficients, but each remained significant and in the same direction as in the immediately preceding model. Therefore the racially-linked processes considered here were endogenous and noteworthy, but may have had an exogenous component as well. The shifts in model parameter estimates from Model E to Model E-Spatial suggested additional localized dynamics operating in different regions of the city.

Summary

Results showed robust, monotonic, detrimental impacts of both Hispanic and Asian neighborhood racial composition on yield, after controlling for age, status, stability, and surrounding dynamics. The shape of these relationships was theoretically consonant, as will be explained below. The effects of African–American racial composition, however, although in the expected direction initially, suggested *increasing* responsiveness to calls for jury duty as African–American racial composition increased, after controlling for other factors. The lack of a connection between neighborhood status and African–American racial composition in integrated neighborhoods, and increasing yield of potential jurors as proportion African–American increased in *this* group of neighborhoods, appeared to underlie this relationship.

Status and stability showed significant, sizable, and durable partial effects in the expected direction. Age composition proved nonsignificant after controlling for adjoining dynamics. The spatial lag variable itself suggested yield-related dynamics also were operating at a level of aggregation above the neighborhood.

Discussion

These results implied several points more generally about the middle stages of juror selection processes. At least in the largest and most racially diverse jurisdiction in Pennsylvania, the likelihood that your neighbors would, when summoned, appear for jury service, did vary by neighborhood. Potential juror turnout or yield *did* have an ecological component. Second, turnout depended not only on the racial composition of the neighborhood, but also on the status and stability of its residents. Underrepresentation of potential jurors along class lines did increase in this stage of the juror selection process, and, confirming Fukurai (1996), was a concern. Third, whether underrepresentation of potential jurors worsened as neighborhoods were increasingly populated by non-Whites depended on the racial group in question. Finally, in addition to the within-neighborhood dynamics illustrated in these results, the impacts of the spatial lag variable suggested additional localized dynamics taking place in the city at a higher level of spatial aggregation.

Focusing more specifically on race, and turning first to the racial group most widely researched in this area, African–Americans, results showed the following. In largely non-African–American neighborhoods, and in largely African–American neighborhoods, as the relative predominance of this group increased, potential juror yield declined. By contrast, in integrated neighborhoods, higher yield linked to a greater prevalence of this group. This supported suggestions made by others (Ellen, 2000) that community-related dynamics could operate quite differently in integrated neighborhoods. Since status differences linked to race differences in slightly African–American and in largely African–American neighborhoods, but not in integrated neighborhoods, results showed a positive link between yield and percent African–American after controlling for status. In short, putting status and other factors aside, Philadelphians from more predominantly African–American neighborhoods did *not* become more underrepresented in these middle stages; they became slightly better represented.

By contrast, underrepresentation *did* become more severe in this stage for those from predominantly Hispanic or Asian neighborhoods. The effect of racial

composition on yield was monotonic, as expected by the theoretical model built on Charles' (2003) work on acculturation and settlement patterns. Those in neighborhoods more predominantly Asian or Hispanic were, according to this model, blocked from fuller societal integration because of cultural barriers including language. These language and cultural barriers may interfere with understanding jury summoning processes and/or having confidence in the system.

Turning to status, results confirmed earlier suggestions that class may be as important and perhaps more important than race (Fukurai, 1996). Lower SES neighborhoods linked to lower yield. The status parameter estimates were sizable. It was harder to get those living in lower income locales to serve as jurors. Several possible processes may underlie this impact: group differences in attitudes toward the criminal justice system; higher average difficulties in reorganizing one's daily round of activities; increased challenges of getting to the courthouse due to greater reliance on public transport; economic necessities prohibiting time off; or disqualification by the courthouse. Specifying the responsible processes awaits future studies. The important point here, however, is that underrepresentation of those from lower status neighborhoods *did* increase during these middle stages of potential juror selection, thus making final jury representativeness along class lines more difficult.

Turning to age, previous work has raised concerns about underrepresentation of younger adults on juries (Boatright, 2001). At the neighborhood level, after controlling for stability, status, and adjoining dynamics, these results suggested age composition was not significant. It could be that the age-turnout ecological relationship was jurisdiction-dependent.

Finally, the spatial autocorrelation control itself was significant. Ecologically patterned dynamics influencing potential juror yield appeared to be operating above the neighborhood level. These complement but do not replace the endogenous impacts shown in the final, spatially-aware model.

Insights from the current study should be embedded in the broader context of its strengths and weaknesses. The current study of course had weaknesses. First, the predictors were neighborhood-level only. It was impossible anywhere in Pennsylvania, as verified by the preliminary inquiry, to access *both* individual-level yield information and individual-level demographic information. Using neighborhood level predictors did *not* mean the study committed the ecological fallacy. The study related impacts of neighborhood context on the results of jury summoning. Inferences from these

results to impacts of *juror* race were not made and would be inappropriate. Separating impacts of juror race from juror neighborhood racial composition should be explored in future work. Finally, although the analyses did control for spatial dependencies, the variable used was not as comprehensive as some have recommended.

Potentially offsetting these weaknesses were several strengths. (1) Multilevel statistical models took into account the nested, multilevel nature of these data and correctly modeled correlated errors. (2) Attitudes and experiences were excluded, thus, there was no potential confusion about causal ordering (confusions which have arisen in several cross-sectional studies on this topic). (3) Models attended to and controlled for three critical determinants of potential juror responsiveness at least at the neighborhood level: age, race, and socioeconomic status. Prior work had suggested that all three might prove relevant (Boatright, 2001; Fukurai, 1996). Numerous studies had failed to simultaneously control for all of these. (4) Impacts of more than one type of racial composition were investigated, as had been suggested by researchers in this area. (5) A variety of models confirmed the robustness of the patterns observed. Models were run with two different age controls and using different cutoffs for the minimum number of potential jurors per neighborhood. (6) Spatial adjacency effects were controlled.

In summary, a full year of geocoded summoned juror data from the country's fourth largest urban jurisdiction were used to explore whether neighborhood context affected "losing" potential jurors in the middle stages of juror selection, between being summoned and showing up on service day. Results showed neighborhood context mattered. Underrepresentation worsened in these middle stages for those from lower status, less stable, more predominantly Asian, or more predominantly Hispanic neighborhoods. Due to race-yield connections in integrated neighborhoods, after controlling for status, an *increasing* percentage of African-Americans linked to higher yield. Varying relationships between different types of racial composition and potential juror yield aligned theoretically with recent work explaining varying settlement patterns for different ethnicities.

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Notes

1. The areal unit used was the census block group. These units typically are comprised of four census blocks, where a census block is typically the area within the four streetfaces which enclose the residences. Census block groups probably correspond more closely to micro-neighborhoods than neighborhoods. Nonetheless, the term “neighborhood” is used throughout for simplicity in describing the context.
2. In making a “Batson challenge” to a preemptory challenge the party “must establish a prima facie case of discrimination...the party making the strike...then must provide a race neutral explanation...and the trial judge decides whether the party opposing the strike has proved purposeful racial discrimination” (Leipold, 1998, p. 948).
3. “African-Americans are almost three times more *proportionally* plentiful in the jury—eligible segment of Allegheny County than they are in the jury sample” (Karns, 2001, p. 5).
4. The above discussion refers primarily to potential jurors dropping out of the selection process in these middle stages. Of course, potential jurors also can be dropped out; they can be disqualified or surplus. Surplus happens if the courthouse needs fewer jury panels than originally anticipated. The jurisdiction studied here did not surplus jurors through a call-in-the-night-before system.
5. At the time these numbers were examined, in late 2001, the more detailed race categories of the 2000 census separating out non-White Hispanics and African-Americans were not available.
6. The proportion of the state’s population of color found in one county is different from the portion of *that* county’s population that is of color, i.e., the percent non-White in each county.
7. Data were released only after “scrubbing” the last two digits of the addresses, making it impossible to know on which side of the street the juror lived. Cases were randomly assigned to one side of the street or another. In cases where the two sides of the street represented different census block groups, these cases may have been put in the wrong neighborhood. This is a non-biasing source of error and most likely means the impacts shown were somewhat attenuated.
8. These analyses were repeated using cutoffs of at least six and at least nine potential jurors per neighborhood. Those results (not shown) were substantively identical to the ones shown. Since HLM models “know” about the size of each group, and use both Bayesian

estimation and precision weighting, different group sizes per neighborhood, and other data features, were taken into account. Therefore, mixing smaller and larger groups across different census block groups was not problematic. Put more prosaically, extremely small groups would not have had an undue influence on the overall analyses. Further, it was extremely unlikely that the results were “biased” by leaving out neighborhoods with only one or two respondents because (a) there were so few of these, (b) precision weighting was used in HLM, and (c) results were invariant to using different minimum Ns as the cutoff.

9. A series of models using the percent over fifty as an alternate age control (results not shown) also were completed. Impacts using 50+ rather than eighteen to twenty-nine were essentially identical to those presented here.

10. The two “curves” were expected when the focus shifts from largely non-African-American to integrated neighborhoods, and from integrated to largely African-American neighborhoods.

11. The percent Hispanic variable was logged after adding one, then squared; the percent Asian was logged after adding one.

12. Multicollinearity diagnostics included inspecting correlation matrices, looking at VIF and tolerance statistics. They suggested multicollinearity was not a problem.

13. See Raudenbush and Bryk (2002, pp. 3–10) for more details on the MAOR submodel. Multilevel models are superior to a “straight” ecological approach predicting neighborhood average yield for a large number of reasons. See, generally, Raudenbush and Bryk (2002), chapters 1 and 2.

14. Conversations with Lou Saulino, Court of Common Pleas, Philadelphia County on February 6, 2002 and April 9, 2002.

15. In Philadelphia, of the initial 287,558 summoned potential jurors in 2001, 16,925 or 5.9 percent were coded as postponed by December 31, 2001.

16. Models were examined where status and stability were entered separately (results not shown).

17. LOWESS was used to estimate the initial shape of each bivariate relationship in question (Cleveland, 1985). This approach drew the “regression” line searching for possible localized non-monotonicities and nonlinearities. Once the shape was outlined, the appropriate curvilinear form of the regression line was constructed.

18. The neighborhood-level cubic, bivariate relationship (R squared = .069) between race and average yield was significantly larger than the curvilinear, quadratic bivariate relationship (R squared = .039) ($F(1/1781)$ R squared change = 54.39; $p < .001$).

19. Additional exploratory models kept in the age control, with just the racial composition effect for African-American. Without the other two racial composition variables (results not shown), the effect of percent African-American remained significant and positive, and became larger ($B = .0024$; $p < .001$). Further, continuing with only the one race variable, when just stability and the percent eighteen to twenty-nine age control were entered, but not status, the African-American effect reverted to its original sign ($B = -.0004$; ns). Conversely, when status but not stability was entered the effect was positive and significant ($B = .002$; $p < .001$). In other words, it was the race connection with status that was causing the sign change.

20. In neighborhoods slightly African-American (0 to 30 percent African-American), as percent African-American increased, average scores on the status index dropped monotonically by about four-tenths of a standard deviation. Status also partialled out race in segregated neighborhoods, over 70 to 80 percent African-American. Going from 70 percent African-American to exclusively African-American, the status index also dropped by about four-tenths of a standard deviation. In integrated neighborhoods, from around 30 to 70 percent African-

American, however, the connection between racial composition and status was perfectly flat. In *this* range of neighborhoods, average yield increased as percent African–American increased. There was no status variation here, thus, controlling for status had no impact in this group.

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