SPECIAL ISSUE ARTICLE

THE IMPACT OF COVID-19 ON CRIME AND JUSTICE

Gang-related crime in Los Angeles remained stable following COVID-19 social distancing orders

Paul Jeffrey Brantingham[1] ⓘ | **George E. Tita**[2] ⓘ | **George Mohler**[3] ⓘ

[1] Department of Anthropology, University of California, Los Angeles, Los Angeles, California, USA

[2] Department of Criminology Law and Society, University of California, Irvine, Irvine, California, USA

[3] Department of Computer and Information Science, Indiana University–Purdue University Indianapolis, Indianapolis, Indiana, USA

Correspondence
Paul Jeffrey Brantingham, Department of Anthropology, University of California, Los Angeles, 341 Haines Hall UCLA, Los Angeles, CA 90095, USA.
Email: branting@ucla.edu

Research Summary: The onset of extreme social distancing measures is expected to have a dramatic impact on crime. Here, we examine the impact of mandated, city-wide social distancing orders aimed at limiting the spread of COVID-19 on gang-related crime in Los Angeles. We hypothesize that the unique subcultural processes surrounding gangs may supersede calls to shelter in place and allow gang-related crime to persist. If the normal guardianship of people and property is also disrupted by social distancing, then we expect gang violence to increase. Using autoregressive time series models, we show that gang-related crime remained stable and crime hot spots largely stationary following the onset of shelter in place.

Policy Implications: In responding to disruptions to social and economic life on the scale of the present pandemic, both police and civilian organizations need to anticipate continued demand, all while managing potential reductions to workforce. Police are faced with this challenge across a wide array of crime types. Civilian interventionists tasked with responding to gang-related crime need to be prepared for continued peacekeeping and violence interruption activities, but also an expansion of responsibilities to deal with "frontline" or "street-level" management of public health needs.

1 | INTRODUCTION

The global COVID-19 pandemic has brought substantial disruption to the normal social and economic activities of daily life (Haleem et al., 2020). Although the response has been varied from one geographic location to another, the most extreme actions taken have been to impose "shelter in place" orders meant to dramatically slow the spread of the virus and take pressure off of strained healthcare systems (Lewnard & Lo, 2020; Reluga, 2010). Shelter in place orders, and social distancing in general, also have a variety of secondary impacts. Demand has collapsed in tourism (Gössling et al., 2020) and entertainment sectors (Lang & Maddaus, 2020), elective medical procedures were cancelled or delayed (Stahel, 2020), and major capital purchases slowed or stopped (EAMA, 2020). There have been some positive externalities associated with the pandemic in relation to the environment (Callaway et al., 2020).

A growing number of studies chart the secondary impacts of COVID-19 on police calls-for-service and reported crime from around the globe (Ashby, 2020; de la Miyar et al., 2020; Felson et al., 2020; Halford et al., 2020; Hodgkinson and Andresen, 2020; Mohler et al., 2020; Piquero et al., 2020). Mohler et al. (2020) posited that an increase or decrease in a specific call or crime type, following the onset of social distancing, can be explained via routine activities theory (RAT) (Cohen & Felson, 1979). RAT posits that for a crime to occur a motivated offender must encounter a suitable target in the absence of a capable guardian that would otherwise disrupt the crime (Eck, 1994; Felson, 1986). RAT posits that the sufficient conditions for crime to occur are generated by people going about their normal daily routines. That is, crime is a natural by-product of the normal ebb and flow of daily life.

The disruption of routine activities brought on by shelter in place orders is expected to drive down crimes if the "new normal" decreases opportunities for motivated offenders and suitable victims to encounter one another (e.g., street-based robbery and assault) or increases guardianship of person or property in ways that deter offenders from taking action (e.g., residential burglary) (Ashby, 2020; Felson et al., 2020). Shelter in place is expected to drive up crime where it either increases the exposure of suitable victims to motivated offenders (e.g., domestic violence) (Bowman et al. 2014; Kaukinen, 2020) or decreases guardianship of person or property (e.g., commercial burglary, car theft from street-based locations) (Hodgkinson and Andresen, 2020). These expectations are reflected in analyses by Mohler et al. (2020), who report that residential burglary calls-for-service and both robbery calls and reported robberies declined significantly in Los Angeles in the several weeks following the city-wide shelter in place order, starting on March 20, 2020. Domestic violence calls increased in both Los Angeles and Indianapolis, and vehicle theft calls and reported crimes increased in Los Angeles. However, the overall change was not nearly as large as might have been expected. As more studies appear, it is also clear that there is significant regional variability in outcomes. For example, although Mohler et al. (2020) found an increase in domestic violence calls-for-service in both Indianapolis and Los Angeles, Piquero et al. (2020) found an initial increase in reported domestic violence incidents in Dallas that then dampened quickly. Similarly, Mohler et al. (2020) found a substantial increase in car theft in Los Angeles, but not in Indianapolis, whereas Hodgkinson and Andresen, (2020) recorded no substantive change

in car thefts in Vancouver. There appears to be some important variation across jurisdictions and crime types that we cannot completely explain.

Here, we turn our attention to gang-related crimes in Los Angeles occurring between January 1, 2016 and recent data extracted on September 28, 2020. Our central question concerns the impact of shelter in place orders on gang-related crime. We expect gang-related crime to persist, or even increase, based on the twin ideas that gang subculture may override concerns about COVID-19, whereas social distancing by other community members (including police) may increase unique opportunities to commit crimes.

Numerous prior studies have demonstrated differences in the dynamics underlying gang-related crime compared with nongang crime (Brantingham et al., 2012, 2020; Maxson et al., 1985; Papachristos, 2007; Rosenfeld et al., 1999). Gang-related crime is more likely to occur in public, involve guns, and trigger retaliations (Bjerregaard & Lizotte, 1995; Brantingham et al., 2020; Decker, 1996). More fundamentally, unique gang motives may drive substantially different routine activities from average offenders (Taylor et al., 2008). We posit a special role for the "reputation economy" in structuring gang routine activities (Brantingham et al., 2019; Katz, 1988; Klein, 1995; Seabrook & Stewart, 2014). Gang-involved individuals commit certain types of crimes, such as homicide and aggravated assaults, at greater frequency specifically to build or defend reputation (Decker, 1996). Offending at a greater frequency may necessitate actively searching for targets as a routine activity. It may also be a by-product of a greater willingness to turn chance encounters into reputation-building opportunities. Our supposition is that the gang "reputation economy," and the behavioral routines built around it, cannot be shut down in the same way as the mainstream, licit economy. As a result, social distancing recommendations and shelter in place orders may have a limited effect on how motivated gang-involved offenders and suitable targets (e.g., gang-involved rivals) move and mix.

Gangs may also affect the distribution and efficacy of capable guardians. Gangs reinforce strong taboos against "snitching"—a characteristic of street codes in general (Anderson, 1999)—and increase fear of the consequences from intervening. These effects may decrease incentives for informal guardianship (e.g., collective efficacy). People may voluntarily withdraw from public places, where they might be witness to (or an inadvertent victim of) a gang crime. This helps gangs to establish control of space. Indeed, gangs concentrate their activity around a limited number of "set spaces" that they tend to exclusively control (Tita & Ridgeway, 2007). Our supposition is that gang routine activities naturally suppress collective efficacy, which cedes control of space to the gangs, creating ideal conditions for gang-related crime. Social distancing recommendations and shelter in place orders, by encouraging people to further withdraw from public spaces, may in fact cede even more space to gang control and create more opportunities for gang-related crime.

Given the above differences in gang subcultures and corresponding gang routine activities, we expect social distancing and shelter in place orders to have a substantially different impact on gang-related compared to nongang crime. To summarize, we expect that gangs to be more likely to (1) ignore or resist social distancing norms and shelter in place orders imposed by city- and state-level actors and (2) take advantage of reduced formal and informal social controls (i.e., guardianship) to commit crimes that further the goals of the gang. If only condition (1) holds, then we expect gang-related crime to remain stable after a shelter in place order takes effect. If both conditions (1) and (2) hold, then we expect gang-related crime to increase after shelter in place.

The remainder of this paper proceeds as follows. We first introduce the context and data used in this study. We then describe our analytic methods, which generally align with interrupted time series approaches to spatiotemporal crime data. Following the presentation of results, we turn to a discussion of implications for theory and public policy.

2 | METHODS

2.1 | Location and data

We examine reported gang-related crimes from Los Angeles, CA, to evaluate the above hypotheses. Los Angeles is a large and diverse coastal city with a resident population of approximately 3.9 million people spread out over 469 square miles. The population is approximately 48.6% Hispanic or Latino (of any race), 28.5% White, and 8.9% African American. Gangs have a long history in Los Angeles, stretching back into the 1940s (Valasik et al., 2017). There has not been a recent gang census in the city. Estimates from 2005 identified as many as 439 active gangs and 39,000 active gang members in the city overall. The number of gangs and active gang members may have come down in the intervening 15 years. However, gang-related crime remains a persistent problem (see below).

Reported crime data from Los Angeles were extracted for the period from January 1, 2016 to September 28, 2020. The data include crime events reported to the Los Angeles Police Department (LAPD). Reported crimes originate primarily when a member of the public calls the police. Unlike calls-for-service, reported crime has gone through an official verification procedure (Klinger & Bridges, 1997; LAPD, 2019). Reported crime is thus less noisy than calls-for-service data. However, reported crime is not free of error and typically captures only a fraction of the crime actually occurring in the environment. We do not seek to correct for crime underreporting due to the general stability of underreporting over time (Xie, 2012).

We concentrate on gang-related aggravated assaults (including homicides), gang-related robberies, gang-related violent crimes involving guns, and all gang-related violent crime types combined. We also include analyses of nongang crimes for each of these crime types. Crimes were labeled as gang related by the LAPD following internal policy guidelines. Specifically, a crime is labeled gang related only after review by an Area Gang Intelligence Officer, or Bureau Gang Coordinator, and such determinations are based on the "totality of the circumstances" (LAPD, 2019). Criteria that may play a role in identifying a crime as gang related include a suspect's or victim's known or suspected affiliation with a gang (e.g., via distinctive tattoos), the occurrence of the crime in a gang territorial area, the crime follows a common gang *modus operandi* such as a drive-by shooting, or gang motives are indicated. The use of multiple criteria in classifying gang-related crimes contradicts the widely held view that LAPD only uses gang affiliation to identify gang-related crimes (Rosenfeld et al., 1999). Studies have supported the general statistical validity of gang-related crime classifications using a range of comparative data sources (Decker & Pyrooz, 2010).

The crime event data we use record the crime type and include a date of occurrence and crime location. We therefore test for changes in the volume of gang-related crime over time in response to the COVID-19 pandemic and related public health and social distancing measures. We also test for changes in the spatial distribution of gang-related crime.

We analyze these data in the context of mandated school and business closures, starting on March 16, 2020, and a comprehensive shelter in place order, issued by the Los Angeles Mayor's office, starting on March 20, 2020.[1] These actions were taken with the goal of slowing the community transmission of COVID-19.

The Los Angeles County Department of Public Health ordered selective business closures targeting establishments that allowed gatherings of 50 or more people. Notably, restaurants were
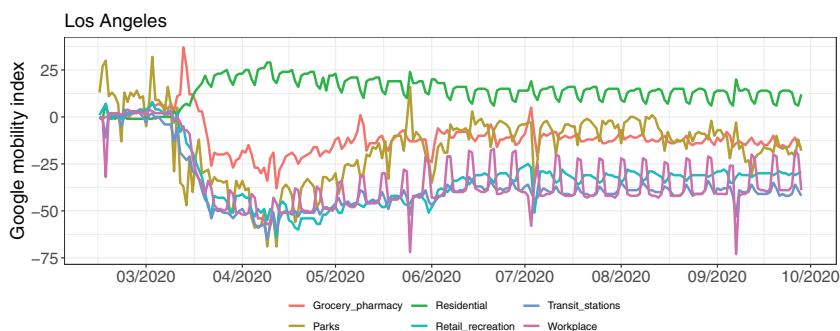
FIGURE 1 Temporal trends in the Google Mobility Index from January 1, 2020 to September 28, 2020 [Color figure can be viewed at wileyonlinelibrary.com]

ordered closed for all indoor dining. All public schools were ordered closed at the same time by the Los Angeles County Department of Education. Universities immediately followed suit.

The shelter in place order issued by the Los Angeles Mayor's Office, starting March 20, 2020, was comprehensive. The order mandated that all City residents isolate themselves in their residences wherever feasible. All businesses within the City of Los Angeles were ordered to cease all operations that required in-person attendance by workers at a workplace. Furthermore, all public and private gatherings of any number of people occurring outside a residence were prohibited. Travel was severely restricted. People were exempted from the order's restrictions only if they were essential workers (e.g., police, fire, EMS) or were themselves seeking essential services (e.g., medical treatment, grocery shopping). Importantly, community intervention workers responding to gang violence were classified as essential workers by the order (see Section 4). Exemptions were also made for outdoor exercise, but major recreation areas (e.g., beaches) we closed. The order's restrictions remained largely in place over the period studied here. Restaurants re-opened for outdoor dining and the list of businesses allowed to open for reduced capacity services expanded in early June 2020.

The impact on routine mobility was both immediate and substantial, however. Figure 1 shows Google mobility indices for Los Angeles County from January 1, 2020 to September 28, 2020 (Google, 2020). The indices are based on anonymized cell phone location history, normalized by a baseline level of activity. Google publishes the mobility index in PDF-form reports, which we parsed using an open-source python tool (PDF Reader, 2020). With the onset of shelter in place, aggregate mobility fell sharply at transit stations, work locations, grocery stores, parks, and retail locations, but increased at residential locations. Mobility rebounded somewhat in early June 2020, but at levels lower than prepandemic mobility. These data provide a good indication that the shelter in place order was widely heeded across the county (Mohler et al., 2020).

2.2 | Methods

We take a time series forecasting approach to detecting changes in the volume of crime, following the recent work in (Glober et al., 2020; Halford et al., 2020). In particular, we fit an autoregressive integrated moving average (ARIMA) model using automatic model selection implemented in the R package "forecast" (Hyndman & Khandakar, 2007) up to March 16, 2020 (see Table 1 for the order parameters of the ARIMA transfer function). The ARIMA model captures correlated errors in

TABLE 1 Order parameters of the best fit ARIMA model corresponding to each crime category

Crime category	ARIMA(p,d,q)
Gang all violent crime	(2,1,1)
Gang aggravated assault	(2,1,1)
Gang robbery	(1,1,1)
Gang gun violent crime	(1,1,1)
Nongang aggravated assault	(2,0,1)
Nongang robbery	(1,1,1)
Nongang gun violent crime	(1,1,1)

time, temporal trends, and seasonality in the data. We then forecast forward in time to September 28, 2020, determining 95% and 99% confidence intervals for the weekly rate of crime. We then look for deviations from the expected rate of crime during the pandemic time period.

Gang crime displays a statistical dependence on the position of gang territorial boundaries, being more common near where gang territories meet (Brantingham et al., 2012; Papachristos, 2007). Using gang territory maps compiled by the LAPD in 2015, we measure the distance in meters between the location where each crime event occurred and the closest known gang territorial boundary. We then compute the mean distance per week of events to the closest boundary to test for a change in the average distance before/after the shelter in place order in Los Angeles.

We also examine changes in gang crime spatial autocorrelation before/after March 16, 2020 in Los Angeles using Moran's I^2 (Moran, 1950). We compare Moran's I spatial autocorrelation index before and after March 16 and use bootstrapping to quantify uncertainty.[3]

3 | RESULTS

Figure 2 shows gang-related crime counts per week from January 1, 2016 to September 28, 2020, along with the ARIMA forecast 95% and 99% confidence intervals after March, 16 2020. In Figure 3, we present similar weekly crime counts and ARIMA forecasts for nongang-related crime. In all plots, the first day of school and business closures on March 16, 2020 is marked with a vertical blue line. The first day of shelter in place occurred 4 days later on March 20, 2020. It is visually apparent that there is little difference in the mean crime volume per week before March 16 and after March 20, suggesting limited impact of shelter in place orders on gang-related crime. There are discrete spikes above the 95% confidence interval for all violent crime, aggravated assaults and gun violent crime. Similar results are observed for nongang-related crime, with the exception of aggravated assault that showed two discrete spikes above both the 95% and 99% confidence interval in late June and late August 2020 and two spikes in gun violent crime about the 95% confidence interval in late June (Figure 3). We also conduct a post hoc power analysis based on simulating fitted ARIMA models with synthetic effect sizes from 10% to 50% for 4 or 8 weeks after the onset of school and business closures. The results are shown in Figure 4. For reasonable synthetic effect sizes, the ARIMA models generally have low statistical power. There is insufficient evidence to reject the null hypothesis, noting that the methods employed in the present paper are not able to detect smaller effects that last for shorter duration.

The distribution of gang-related crimes in relation to gang territorial boundaries similarly exhibits no significant change with the onset of shelter in place (Figure 5). To the extent that gang
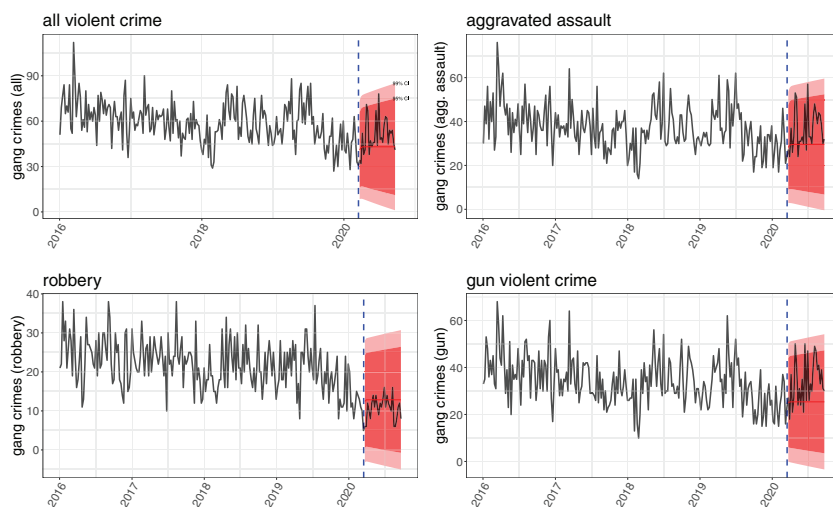
FIGURE 2 Reported gang-related crime events per week for different types. The onset of school and business closures on March 16, 2020 is marked by a blue vertical line. The ARIMA model 95% and 99% confidence intervals are shown in dark and light red, respectively [Color figure can be viewed at wileyonlinelibrary.com]

territorial boundaries influence where gang-related crimes occur, there appear to be no interaction effects with shelter in place orders. To test this empirically, we compare the measures of spatial autocorrelation before and after the enactment of the shelter in place order.

Figure 6 shows box–whisker plots for the distribution of bootstrapped Moran's *I* values before and after the shelter in place order. Spatial events are more clustered prior to shelter in place (higher Moran's *I*), but the difference is not statistically different (the boxplot whiskers provide a 95% confidence interval for the Moran's *I* estimator and there is significant overlap between the two confidence intervals). In other words, the spatial distribution of gang-related crimes after shelter in place is no more spread out than what would be expected by chance.

4 | DISCUSSION

The impression provided by the analysis of crime event data is that criminal street gangs have not been impacted substantially by shelter in place orders related to COVID-19. There is no statistically significant change in the volume of gang-related violent crimes overall, gang-related robberies or assaults, or gang-related gun violent crimes. Although there is some indication of more diffuse gang-related crime hot spots, after shelter in place, this change is not statistically significant. Moreover, the spatial positioning of gang-related crimes with respect to gang territorial boundaries is unchanged. With the exception of a few unusual, but brief spikes in late June and late August 2020, the temporal trends in both gang and nongang violent crime are within expected bounds. The statistical power of the models is low, however.

We note a potential secular change in the frequency of gang-related robberies beginning in July 2019. Gang-related robberies decline consistently over the next 6 months and stabilize at a lower level before the onset of shelter in place in mid-March 2020. This secular shift is not seen in gang-related aggravated assaults or gun violent crimes. There is a slight increase in nongang robberies at roughly the same time. The cause of the shift in gang-related robberies is unknown,
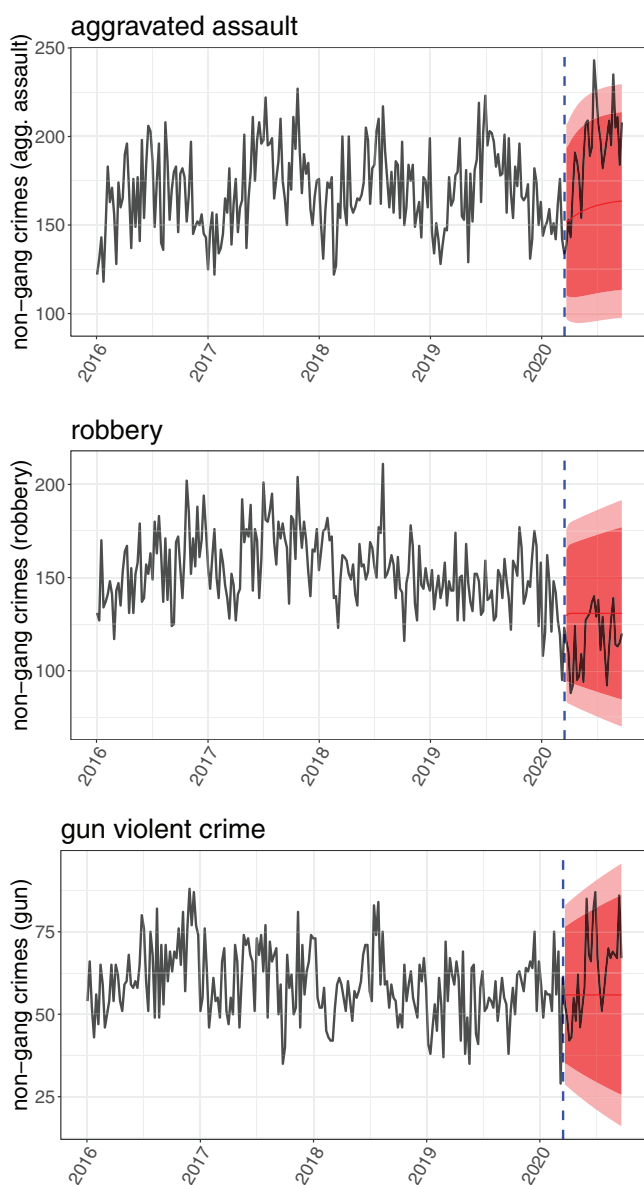
FIGURE 3 Reported crime events per week for different nongang related crime types. The onset of school and business closures on March 16, 2020 is marked by a blue vertical line. The ARIMA model 95% and 99% confidence intervals are shown in dark and light red, respectively [Color figure can be viewed at wileyonlinelibrary.com]

but may be related to growing recognition among the LAPD rank-and-file of alleged misconduct by LAPD Metropolitan Division officers in filing gang field interview cards in 2018 and early 2019 (LAPD, 2020; Winton & Puente, 2020). The decline may reflect growing reluctance of LAPD officers to label crimes as gang related. Gang-related robberies therefore decrease, whereas nongang robberies increase. We speculate that this effect applies to robberies, but not aggravated assaults, because there is more discretion involved with labeling the former crime type. However, we are unable to confirm this speculation.

Our analyses also cover a period of widespread, recurring protests against police violence following the killing of George Floyd on May 25, 2020, by a Minneapolis police officer. Based on data from the Armed Conflict Location Data (ACLED) project (Raleigh et al., 2010), Los Angeles saw weekly protests with particular spikes in violence and looting during the weeks of May 24,
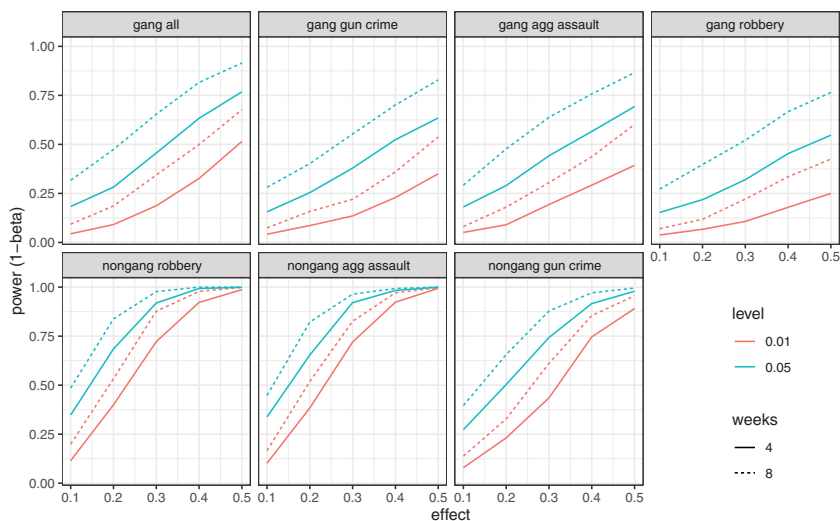
FIGURE 4 Power analysis for fitted ARIMA models. Variable effect size of 10%–50% simulated for 4 or 8 weeks with power (probability of detecting effect) shown on the *y*-axis [Color figure can be viewed at wileyonlinelibrary.com]
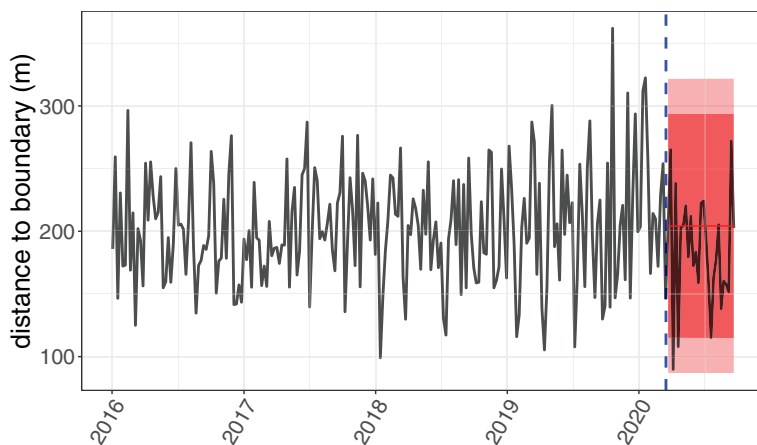

FIGURE 5 The mean distance in meters per week between event locations and the closest gang territorial boundary. The mean is computed over all gang-related crimes occurring each week. The onset of school and business closures on March 16, 2020 is marked by a blue vertical line. The ARIMA model 95% and 99% confidence intervals are shown in dark and light red, respectively [Color figure can be viewed at wileyonlinelibrary.com]

August 9, and September 6. Allowing for temporal lags of up to 3 weeks, we find no significant correlations between the number of protests and gang-related violence. However, more nuanced models may be needed to examine whether declining attitudes toward police generate feedback loops that impact crime.

Focusing on the general pattern in gang-related crimes, a parsimonious conclusion is that the gang routine activities remained largely unchanged in spite of the large-scale disruptions to other social and economic activity brought on by shelter in place. We may conclude that motivated offenders were still able to find suitable targets, at the same rates and at approximately the same
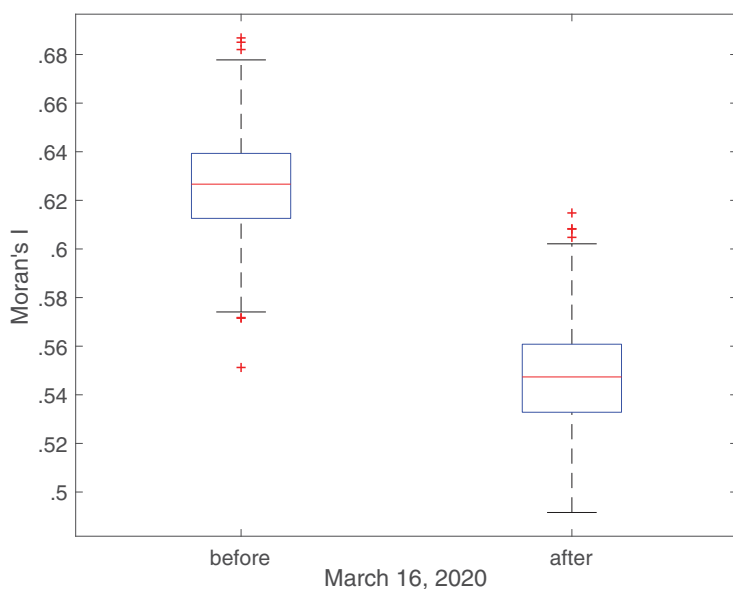
FIGURE 6 Box plots of the bootstrapped distribution of Moran's *I* before and after March 16, 2020. Lower and upper hinges of each box correspond to the 25% and 75% percentiles, whereas the whiskers extend to a 95% confidence interval (outliers beyond the whiskers are marked in red) [Color figure can be viewed at wileyonlinelibrary.com]

locations, after shelter in place order took effect as before. The same conclusion holds for nongang violent crime (Ashby, 2020; Mohler et al., 2020). Indeed, the temporal trends in gang-related crime following shelter in place are unremarkable compared with nongang violent crimes.

That gang-related crime is not down may be cause for alarm. However, we might also be relieved that gang-related crime is not up under the circumstances. We argued at the outset that the uniqueness of gang motives might make compliance with shelter in place orders less likely among gang-involved youth. Additionally, compliance among the public at large could create conditions where gangs actually have much greater freedom to act. We suggested that these two factors combined could lead to an increase in gang-related violent crime. The absence of any substantive change may suggest a lack of compliance with shelter in place orders by the gangs, but provides no reason to believe that gangs were taking additional advantage of conditions. However, we do not have any direct evidence of gang behavior beyond the occurrence of gang-related crime to assess these conclusions.

To explain our findings, we must also consider the impact of policing and civilian gang intervention efforts. There is some evidence that discretionary traffic stops by the LAPD declined quickly with the onset of social distancing practices in early March 2020. Specifically, Mohler et al. (2020) found that LAPD traffic stops were cut in half from approximately 400 per day city-wide, prior to the shelter in place order, to approximately 200 per day after. Other types of proactive patrol may have been similarly impacted. Thus, it is possible that reductions in formal social controls may in part underlie the stability of gang-related (and nongang) crime following the shelter in place order. That is, gang-related crime *would have* declined had it not been for reductions in policing activity. In this case, what we do observe is the product of gangs taking advantage of new opportunities, but only up to a level consistent with activity prior to shelter in place. However, without more information on policing efforts over the course of the pandemic, it is impossible to say more.

Conversely, increased formal/informal social control by civilian gang intervention workers could be partially responsible for keeping gang-related crime from increasing beyond normal levels. Media reports, from 1 month into shelter in place restrictions, noted expanded roles for community intervention workers in curbing the spread misinformation about the virus, distributing

personal protective equipment (PPE), and directly assisting families in managing the impact of COVID-19 infections (Santa Cruz, 2020). Such activities were added on top of their regular duties in responding to gang violence (Tremblay et al., 2020). Recognizing both roles, the Mayor of Los Angeles declared community intervention workers "emergency personnel" exempt from his shelter in place order (Garcetti, 2020). Community intervention workers may have provided continuity in formal social controls on gang activity through their continued gang intervention efforts. Informal social controls may have also emerged as a by-product of community intervention workers' greater engagement with the community in their public health efforts. We see both possibilities as influencing the distribution and intensity of guardianship of people and property.

4.1 | Policy implications

Changes in crime in response to unexpected, exogenous shocks can have many different policy implications. We focus on implications stemming from the COVID-19 pandemic for gang violence prevention, intervention, and suppression efforts that are most obvious to us. Although we lack empirical data on changes in staffing levels and whether or not the priorities of patrol were altered by the pandemic, it seems reasonable to infer that the stability of gang-related crime following the Los Angeles shelter in place order underscores the importance of protecting the capacity of law enforcement to be able to respond to public demand and pursue investigations in a timely manner. Police departments themselves face the potential challenges of a reduced workforce, if personnel fall ill, as has been documented in many large cities including New York (Holcombe, 2020), and more complex operational requirements to protect officers and the public in face-to-face interactions. Understandably, normal social distancing measures may be hard to accommodate in some police–public interactions. Our central point is that there appears to be little room for police to step back from normal duties surrounding gangs and gang-related crimes.

The findings also suggest that the capacity of civilian gang interventionists to deal with gang-related crime also needs to be protected, and possibly expanded given the novel public health roles they have assumed during the pandemic. Gang interventionists play a central role in the comprehensive violence reduction strategy spearheaded by the Los Angeles Mayor's Office of Gang Reduction Youth Development (GRYD) (Tremblay et al., 2020). GRYD's civilian intervention workers, many of whom grew up on the communities they serve, are responsible for day-to-day peacekeeping among rival gangs and responding to violent gang crimes as they happen to reduce the likelihood of tit-for-tat retaliation. Policy makers should be attentive to whether social distancing and shelter in place orders are impacting the capacity of interventionists to perform these essential functions. If it is "business as usual" for gangs, it is also important that "business as usual" is maintained for interventionists. If added to these regular functions are new responsibilities as frontline workers in the fight against COVID-19, then the same "street cred" that allows interventionists to insert themselves in a gang conflict also appears to underwrite their ability to intervene in response to social and healthcare challenges stemming from the coronavirus and shelter in place orders. In fact, interventionists are themselves referring to these efforts as "virus interruption" that parallels their main function in "violence interruption" (National Street Outreach Partnership, 2020). In the present crisis, community intervention workers have mostly been taking on these extra responsibilities by their own initiative. Policy makers should consider how to appropriately protect and possibly expand such capacities for the current as well as future crises such that they can perform these expanded duties without hampering their ability to intervene in gang conflicts.

ORCID

Paul Jeffrey Brantingham https://orcid.org/0000-0003-1079-0053
George E. Tita https://orcid.org/0000-0001-5409-6763
George Mohler https://orcid.org/0000-0003-4293-5106

ENDNOTES

[1] The full orders may be viewed at http://www.publichealth.lacounty.gov/phcommon/public/media/mediapubhpdetail.cfm?prid=2269, https://www.tusd.org/district/news/1676600/school-closes-for-students-march-16-27-2020 and https://www.lamayor.org/COVID19Orders.

[2] Moran's *I* calculation: We first discretize Los Angeles into a 50×50 grid and count the number of events, n_i, in grid cell *i*. Moran's *I* is then defined as $I = \frac{N}{W} \frac{\sum_i^t \sum_j^t w_{ij}(n_i - \bar{n})(n_j - \bar{n})}{\sum_i (n_i - \bar{n})^2}$, where $\bar{n}$ is the average number of crimes across grid cells, w_{ij} is a spatial with that we choose as 1 or 0 depending on whether or not cell *i* and *j* are neighbors, *W* is the sum of w_{ij}, and *N* is the number of grid cells.

[3] Bootstrap analysis: We resample with replacement event coordinates from the data, tally the counts n_i over the sample, and compute Moran's *I*. We repeat this process 1000 times yielding a bootstrap distribution of Moran's *I* that allows us to quantify uncertainty in the estimate due to finite sample size.

CONFLICT OF INTEREST

Two of the authors serve on the board of PredPol.

REFERENCES

Anderson, E. (1999). *Code of the street: Decency violence and the moral life of the inner city*. Norton and Company.

Ashby, M. P. (2020). Initial evidence on the relationship between the coronavirus pandemic and crime in the United States. *Crime Science*, 9, 1–16.

Bjerregaard, B., & Lizotte, A. J. (1995). Gun ownership and gang membership. *The Journal of Criminal Law and Criminology*, 86(1), 37–58.

Bowman, J. H., IV, Young, J. T. N., Baldwin, J. M., & Meldrum, R. C. (2014). Specifying the Sources of Misperceptions of Peer Deviance. *Criminal Justice and Behavior*, 41(1), 91–113.

Brantingham, P. J., Tita, G. E., Short, M. B., & Reid, S. E. (2012). The ecology of gang territorial boundaries. *Criminology*, 50(3), 851–885.

Brantingham, P. J., Valasik, M., & Tita, G. E. (2019). Competitive dominance, gang size and the directionality of gang violence. *Crime Science*, 8(1), 7.

Brantingham, P. J., Yuan, B., & Herz, D. (2020). Is gang violent crime more contagious than non-gang violent crime? *Journal of Quantitative Criminology*. https://doi.org/10.1007/s10940-020-09479-1

Callaway, E., Cyranoski, D., Mallapaty, S., Stoye, E., & Tollefson, J. (2020). The coronavirus pandemic in five powerful charts. *Nature*, 579, 482–483.

Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American Sociological Review*, 44, 588–608.

Decker, S. (1996). Collective and normative features of gang violence. *Justice Quarterly*, 13, 243–264.

Decker, S. H., & Pyrooz, D. C. (2010). On the validity and reliability of gang homicide: A comparison of disparate sources. *Homicide Studies*, 14(4), 359–376.

European Automobile Manufacturers Association (EAMA). (2020). *Passenger car registrations: –38.5% four months into 2020; –76.3% in April*. European Automobile Manufacturers Association.

Eck, J. E. (1994). *Drug markets and drug places: A case-control study of the spatial structure of illicit drug dealing* (Unpublished PhD dissertation). University of Maryland.

Felson, M. (1986). Linking criminal choices, routine activities, informal control and criminal outcomes. In D. B. Cornish & R. V. Clarke (Eds.), *The reasoning criminal: Rational choice perspectives on offending* (pp. 119–128). Springer-Verlag.

Felson, M., Jiang, S., & Xu, Y. (2020). Routine activity effects of the COVID-19 pandemic on burglary in Detroit. *Crime Science*, *9*(1), 10.

Garcetti, E. (2020). *Public order under city of Los Angeles emergency authority*. Mayor Eric Garcetti.

Glober, N., Mohler, G., Huynh, P., Arkins, T., O'Donnell, D., Carter, J., & Ray, B. (2020). Impact of COVID-19 pandemic on drug overdoses in Indianapolis. *Journal of Urban Health*, *97*(6), 802–807.

Google. (2020). *Google COVID-19 community mobility reports.* https://www.google.com/covid19/mobility/

Gössling, S., Scott, D., & Hall, C. M. (2020). Pandemics, tourism and global change: A rapid assessment of COVID-19. *Journal of Sustainable Tourism*, *29*(1), 1–20.

Haleem, A., Javaid, M., & Vaishya, R. (2020). Effects of Covid 19 pandemic in daily life. *Current Medicine Research and Practice*, *10*(2), 78–79.

Halford, E., Dixon, A., Farrell, G., Malleson, N., & Tilley, N. (2020). Crime and coronavirus: Social distancing, lockdown, and the mobility elasticity of crime. *Crime Science*, *9*(1), 1–12.

Hodgkinson, T., & Andresen, M. A. (2020). Show me a man or a woman alone and I'll show you a saint: Changes in the frequency of criminal incidents during the COVID-19 pandemic. *Journal of Criminal Justice*, *69*, 101706.

Holcombe, M. (2020, April 7). 12 NYPD members have died from suspected cases of coronavirus and nearly 20% of its uniformed workforce is out sick. *CNN*.

Hyndman, R. J., & Khandakar, Y. (2007). *Automatic time series for forecasting: The forecast package for R. Number 6/07*. Monash University, Department of Econometrics and Business Statistics.

Katz, J. (1988). *The seductions of crime*. Basic Books.

Kaukinen, C. (2020). When stay-at-home orders leave victims unsafe at home: Exploring the risk and consequences of intimate partner violence during the COVID-19 pandemic. *American Journal of Criminal Justice*, *45*, 668–679.

Klein, M. W. (1995). *The American street gang: Its nature, prevalence, and control*. Oxford University Press.

Klinger, D. A., & Bridges, G. S. (1997). Measurement error in calls-for-service as an indicator of crime. *Criminology*, *35*(4), 705–726.

Lang, B., & Maddaus, G. (2020, April 29). Hollywood's great depression: Meet the entertainment workers left jobless by the coronavirus pandemic. *Variety*.

LAPD. (2019). Los Angeles Police Department Manual. http://www.lapdonline.org/lapd_manual/.

Los Angeles Police Department (LAPD). (2020). *LAPD statement on internal affairs investigation nr20005ml.* https://www.lapdonline.org/home/news_view/66155

Lewnard, J. A., & Lo, N. C. (2020). Scientific and ethical basis for social-distancing interventions against COVID-19. *The Lancet: Infectious Diseases*, *20*, 631–633.

Maxson, C. L., Gordon, M. A., & Klein, M. W. (1985). Differences between gang and nongang homicides. *Criminology*, *23*(2), 209–222.

Mohler, G., Bertozzi, A. L., Carter, J., Short, M. B., Sledge, D., Tita, G. E., Uchida, C. D., & Brantingham, P. J. (2020). Impact of social distancing during COVID-19 pandemic on crime in Los Angeles and Indianapolis. *Journal of Criminal Justice*, *68*, 1–7.

Moran, P. A. (1950). Notes on continuous stochastic phenomena. *Biometrika*, *37*(1/2), 17–23.

National Street Outreach Partnership. (2020). *Street outreach during COVID-19: The essential role of violence interruption virus interruption*. Urban Peace Institute.

Papachristos, A. V. (2007). *Murder by structure: A network theory of gang homicide* (Unpublished PhD dissertation). The University of Chicago.

Piquero, A. R., Riddell, J. R., Bishopp, S. A., Narvey, C., Reid, J. A., & Piquero, N. L. (2020). Staying Home, Staying Safe? A Short-Term Analysis of COVID19 on Dallas Domestic Violence. *American Journal of Criminal Justice*, *45*, 601–635.

Raleigh, C., Linke, A., Hegre, H., & Karlsen, J. (2010). Introducing ACLED: Armed conflict location and event data. *Journal of Peace Research*, *47*(5), 651–660.

Reluga, T. C. (2010). Game theory of social distancing in response to an epidemic. *PLoS Computational Biology*, *6*(5), 1–9.

Rosenfeld, R., Bray, T. M., & Egley, A. (1999). Facilitating violence: A comparison of gang-motivated, gang-affiliated, and nongang youth homicides. *Journal of Quantitative Criminology*, *15*(4), 495–516.

Santa Cruz, N. (2020, April 19). *Gang intervention workers helping keep residents indoors, safe during coronavirus crisis*. Los Angeles Times.

Seabrook, L. A., & Stewart, J. (2014). Snitches get stitches: Combating witness intimidation in gang- related prosecutions. *US Attorneys Bulletin*, *62*, 83.

Stahel, P. F. (2020). How to risk-stratify elective surgery during the COVID-19 pandemic? *Patient Safety in Surgery*, *14*(8), 1–4.

Taylor, T. J., Freng, A., Esbensen, F.-A., & Peterson, D. (2008). Youth gang membership and serious violent victimization: The importance of lifestyles and routine activities. *Journal of Interpersonal Violence*, *23*(10), 1441–1464.

Tita, G., & Ridgeway, G. (2007). The impact of gang formation on local patterns of crime. *Journal of Research in Crime and Delinquency*, *44*, 208–237.

Tremblay, A., Herz, D., Zachery, R., & Kraus, M. (2020). *The Los Angeles Mayor's Office of Gang Reduction and Youth Development comprehensive strategy*. GRYD Research Brief, No. 1.

Valasik, M., Barton, M. S., Reid, S. E., & Tita, G. E. (2017). Barriocide: Investigating the temporal and spatial influence of neighborhood structural characteristics on gang and non-gang homicides in east Los Angeles. *Homicide Studies*, *21*(4), 287–311.

Winton, R., & Puente, M. (2020, January 6). Officers falsely portrayed people as gang members, falsified records, LAPD says. *Los Angeles Times*.

Xie, M. (2012). Area differences and time trends in crime reporting: Comparing New York with other metropolitan areas. *Justice Quarterly*, *31*(1), 43–73.

AUTHOR BIOGRAPHIES

Jeff Brantingham is Professor of Anthropology at the University of California Los Angeles. His research interests lie in the study of human behavior in complex environments. He is member of the research and evaluation team for the Los Angeles Mayor's Office of Gang Prevention and Youth Development.

George Tita is a Professor in the Department of Criminology, Law and Society at the University of California–Irvine. His interests include the study of inter-personal violence with a focus of homicide, urban street gangs, and the community context of crime.

George Mohler is an Associate Professor of Computer and Information Science at Indiana University - Purdue University Indianapolis. His research focuses on the design of algorithms and software tools for studying social systems, estimating the probability of societally harmful events, and helping smart cities allocate resources in response. Mohler holds a Ph.D. in Mathematics from the University of California Santa Barbara and a B.S. in Mathematics from Indiana University.