J Quant Criminol (2016) 32:471–488
DOI 10.1007/s10940-016-9294-9

ORIGINAL PAPER

# The Role of Immigration: Race/Ethnicity and San Diego Homicides Since 1970

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Published online: 21 March 2016


**Abstract**
*Objectives* The temporal variation in homicide is examined by studying trends in race/ethnic specific killings (e.g. Blacks, Latinos and Whites). Two substantively important issues are also addressed—a closer examination of the role community heterogeneity plays in homicide levels and the treatment of immigration as an endogenous social process.
*Methods* Data are reported homicides in the city of San Diego, California over the period 1960–2010. The address of each killing is geocoded into 341 census tracts.
*Results* We find that neighborhoods experiencing increases in the foreign-born population tend to be less violent. White and Latino homicide victimization was reduced significantly as a product of increases in the neighborhood concentration of foreign-born individuals. Supplementary analyses did not find empirical evidence that the influx of foreign-born individuals could (or should) be considered a disruptive social process. Over the past five decennial census periods, the exponential increase in immigration in this border city is not associated with an increase in homicide victimization.
*Conclusions* When examined through a wider temporal lens than is typically employed, and accounting for the endogeneity of immigrant residential settlement, we find no support for the claims that immigration is a crime generating social process.

**Keywords** Communities and crime · Crime trends · Immigration and crime · Longitudinal studies · Racial and ethnic disparities

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## Introduction

Recent research findings informs contemporary knowledge of Latino crime and violence (Martinez 2015; Sampson et al. 2005; Velez 2009). This work focused on racial/ethnic variations in crime/delinquency drawn from national or local surveys or explorations of Latino crime across macro-level units (Desmond and Kubrin 2009; Sampson et al. 2005; Martinez and Stowell 2012). Almost without exception this body of research is dominated by cross-sectional studies reporting a negative or null relationship between immigration and crime. The handful of existing longitudinal studies report changes in immigration over time contribute to less violent crime in general and even decreases Latino violence specifically (MacDonald et al. 2013; Martinez et al. 2010; Ousey and Kubrin 2009, 2014). That issue is the crux of this paper.

In this article we argue that incorporating temporal change is an important element in advancing the study of immigration and crime. Put another way, while overall homicide rates have declined dramatically in recent decades questions still remain about the variation in homicide trends (Monkkonen 2001; Rosenfeld et al. 2013). Most criminological studies exclude past periods of social change (Vietnam War), varying societal reactions to immigration (Hart-Cellar Act of 1965, IRCA of 1986, Proposition 187 among others), the crack cocaine epidemic, and periods of economic decline including the recent Great Recession (Lauritsen et al. 2013; Lauritsen and Heimer 2010; Lee 2013). While we cannot systematically assess how these larger historical and social forces shape local context we recognize that these larger macro forces overlap with community level forces and help explain how contemporary crime interacts with race/ethnicity in urban America (Sampson and Lauritsen 1997).

Another purpose of this paper is to provide additional evidence regarding the connection of immigration to homicides disaggregated by race/ethnicity. We contend that long-term changes in White, Black and Latino homicides are not influenced in the same manner overtime. Lauritsen et al. (2013) claim changes in social and economic conditions contribute to increases in violence, and in turn, impact racial and ethnic minorities since they are most susceptible to changes in disadvantage, stability and presumably immigration. Another benefit of disaggregation is distinguishing Latinos from non-Latino whites or blacks since a "crime trend that do not exclude Latinos from non-Latinos could mask important differences since such trends are dominated by the experiences of the majority group-non-Latino Whites". One advantage of this paper over others is its unique ability to perform analyses of a racial/ethnic group over an extended period of time that has remained largely inaccessible in current criminological studies.

The inclusion of a community racial/ethnic heterogeneity measure is also examined. Substantively, we argue that this is an important consideration in this context, as the share of both Latinos and Asians has grown significantly across neighborhoods during the period under investigation.[1] The presence of these groups across neighborhoods coupled with the reduction in homicide levels over time raises a related question. To what degree it is appropriate to conceive of immigration as an exogenous social process? A number of studies have found support for the fact that there is an element of selectivity influencing

[1] Between 1970 to 2010, the percent Latino in the average community increased by roughly 122 % (13–29 %) and the size of the Asian population increased by approximately the same amount, growing over 119 % (7–16 %), increases driven primarily by increases in the size of the foreign-born populations for both groups. The size of the foreign-born in the average neighborhood also experienced a significant increase over this period, increasing by 225 % (7.5–25.5 %).

immigrant residential settlement patterns, which may have implications for understanding the immigration and violent crime relationship (see MacDonald et al. 2013; Ousey and Kubrin 2014). These studies still find that immigration to be inversely related to criminal deviance, however, none are able to examine this question over a sustained period of time at the community level.

In this paper we assess the over-time relationship between immigration and homicide in 341 census tracts over five time points and killings spanning over the 1960 through 2010 period. Many southwestern cities contained long-standing Mexican–American (Latino) communities that experienced social and political change in the sixties and seventies. Thus, the story of our research setting reflects changes playing out in other border or urban cities in border-states. By going back to the past we hope to inform the present by considering periods capturing immigration waves, military mobilization and economic stress. Clearly the effects of social and economic factors including immigration require examination over time and over extended periods of time.

Our analysis builds on the current research literature of trends in violent crime in several ways. Specifically this study borrows from and contributes to criminological research especially trends in violence, race/ethnic specific homicides, the immigration and violence nexus, and communities and crime studies (Desmond and Kubrin 2009; Vélez and Lyons 2012). Thus, we begin by drawing from each theme whenever possible but begin the following section with theoretical background and research setting. We follow that with information on the research setting, data sources, measures, and analytic methods used in this study. Next, we present and discuss the results. We close with a section that highlights the results and suggestions for further inquiry.

## Background

The Chicago School of Sociology was founded out of concern over the consequences of immigration (Bursik 2006). Much of this pioneering research was illustrated in Shaw and McKay's (1942/1969) research contributions studying distressed community conditions on levels of crime. They noted how variations in the rates of delinquency across nativity, nationality, or racial groups corresponded to the structural composition of communities. They also argued that when exposed to the same types of areas, boys of native parentage and boys of foreign parentage have similar rates of delinquency (Bursik 2006). Because of this underlying logic, the direct effect of immigration was not a focus in the initial tests of the theory. Although social disorganization theory posits that "changes in the nationality composition of a population are not accompanied by appreciable changes in relative rates of delinquency," this assumed temporal influence has not yet been examined fully in particular over long periods of time (Bursik 2006, 26).

Moreover, contemporary studies have documented the importance of social structural factors in observed levels of crime and deviance. This finding is hardly controversial in the communities and crime literature (see Lee et al. 2001; Lyons et al. 2013; Martinez et al. 2004; Stowell 2007; Velez 2009). But social disorganization theory goes further, positing that crime is a "relatively constant" condition of a specific type of urban neighborhood, independent of the characteristics of its residents (Shaw and McKay 1942/1969). In advancing this argument, disorganization theorists make two assumptions about neighborhood processes over time. The theory takes for granted the structural stability of such neighborhoods, which in turn suggests the relative intractability of their levels of criminal deviance overtime. But the traditional assumption of ecological stability has been

questioned in studies of social disorganization (Bursik 1988, 2006; Bursik and Webb 1982). The conclusion of this literature is that the stability, so carefully documented by Shaw and McKay in the first half of the twentieth century, has attenuated somewhat after World War II, which is a process Bursik (1986: 402) referred to as increased "ecological differentiation."

Thus ecological structures will vary over some time. Perhaps most remain relatively stable despite the population changes in Chicago. But undoubtedly some communities are constantly redefined or undergoing redefinition of their role in the ecological system. Cross-sectional work takes for granted that communities do not change over time relative to each other or in terms of overall structural conditions. Although longitudinal studies are costly and difficult to conduct, they are necessary to accurately assess if changes in crime are related to changes in structural conditions over time. Bursik and Webb (1982, 28) pointed out that the dynamic changes associated with the "invasion and succession of new demographic groups is at the heart" of the ecological approach to crime.

At the same time, national and bi-national factors along the U.S.-Mexican border shape local context. Since annexation, the city of San Diego simultaneously accommodated internal migrants from other parts of the southwestern United States joining migrants moving in from various interior and border Mexican states. Most enter via the Mexican gateway city of Tijuana, a staging ground for a disproportionate number of border crossers (legality aside) entering into the United States (see Nevins 2002). Until recently thousands of Mexican citizens annually move across Mexican regions before entering the United States signifying wide scale and long-term displacement on both sides of the border (Rodríguez et al. 2008; Sáenz and Morales 2015; Samora 1971). Traditionally, internal movement followed a path from rural to urban areas and then to the states at the Mexican border facing the southwestern United States. Central and South America migrants now take a similar trail moving through Mexico on their way to the United States. Unlike non-border U.S. cities, for the past half of century these dynamic social processes influence everyday life across border communities (Nevins 2002).

The traditional breakdown and disruption associated with immigration in socially disorganized neighborhoods should be seen across U.S.-Mexican border communities. For example the city of San Diego doubled in population size and the percent foreign-born tripled over the time period between 1970 and 2010 and undoubtedly some communities bore the brunt of population changes more than others. In keeping with traditional tenets of social disorganization theory, this population surge across time exacerbates social and economic conditions leading us to expect increases in local crime. Since the majority of unauthorized entries over time facilitate dislocation and disorganization, the effects of population turnover appear throughout time in the urban border region (Nevins 2002: 3). However, this long held notion has not been largely supported empirically and it remains a somewhat open question.

## The Current Setting

Long ignored by mainstream society, Ngai (2004) argues that as far back as the fifties, immigration policy created a complicated migratory Mexican-worker population consisting of Mexican Americans, legal immigrants, undocumented migrants, and braceros or imported contract workers (Ngai 2004: 150). Likewise "border crosser" variations exist including the "illegal alien, braceros, commuters" and other undocumented migrants

searching for work (Samora 1971: 6–8). Some were braceros or temporary farm workers. Others green cardholders that live in Mexico and commute to the United States on a "legal resident alien" visa permitting a daily commute. Still others had a temporary border crossing form that permitted them to cross for 72 h to visit, shop, or engage in business-related activity. In many cases these crossers worked as domestics or in the farm fields (Samora 1971). Eventually the bracero program ended, but the need for labor remained so the undocumented population rose amidst calls for greater border enforcement and immigration restrictions.

We recognize that census definitions captured roughly by percent Latino or percent immigrant proxies prevent us from capturing the complex distinctions within the Latino and immigrant community. But this information is presented to serve as a reminder that variations within the immigration experience exist and that this consistent crossing is unique to the border. Still, a central question to studies of this kind is whether such dynamic changes (particularly with respect to community compositional qualities) render a neighborhood more vulnerable to violence?

The 1970–2010 period that we investigate in this paper represents a strategic era of transformation in which to test our hypotheses because (as we will show) San Diego experienced a surge in the foreign-born population during this time. But again unraveling the immigration–crime link in San Diego is complicated by the reality that the city's Mexican- and smaller Asian-origin populations are a study in contrasts ranging between old native-born, new arrivals and both touched by immigration. Members of the two dominant ethnic/immigrant groups also generally reside in neighborhoods with varying levels of community disadvantage, affluence, and violence. While much of this information is not directly tested in the analyses this section provides some historical context to clarify how immigration changed over a 50 year period. Although heavily Mexican-origin, the immigration story here is not exclusively Latino but it is shaped by economic immigrant and political refugee origins (Martinez 2015).

San Diego communities are prominent features in the local immigrant destination story and resemble many other southwestern cities such as Denver, El Paso, Los Angeles, and San Antonio among others. Latinos are the largest racial/ethnic minority group in the city but half of the Mexican-origin population is foreign-born (47 %). While overrepresented in service sector jobs Latinos and Asians are now present in professional occupations a factor that along with the concentration of immigrants might help to buffer neighborhoods against crime and delinquency (see Sampson and Bean 2006). As Sampson (2008) argues, that the beneficial effects of economic affluence and immigration as a social process reduce crime for nonimmigrant groups as well.

## Data and Methods

The current study brings together neighborhood-level and homicide data for five decennial census periods (1970, 1980, 1990, 2000 and 2010). These data are unique in studies on this subject in part because they cover such a wide time frame. To our knowledge, no other examination of the effect of immigration on crime includes more than three census periods (Martinez et al. 2010; Ousey and Kubrin 2009). In addition, our data are also unique in that they extend the period under investigation in both directions by introducing indicators for an earlier decade (1970) and the most recent period (2010), neither of which have yet been included in criminological studies of immigration. As a consequence, the present study is

able to place the immigration/crime relationship in a wider context than has been possible in previous studies.

The data used in this study are collected from two sources. The homicide victimization data, the dependent variable, were compiled from the homicide investigation unit of the San Diego Police Department. Information on each homicide incident was gathered directly from reports written by investigators (see Martinez et al. 2010 for a detailed description of the collection process). The reports include many important characteristics regarding the homicide event, including victim characteristics, offender information and the homicide narrative. More importantly, the address for the incident location and the race/ethnicity of the victim were key elements for the purposes of this study. The geographic information was necessary for the purposes of geocoding the events using the most recent street configuration for the city of San Diego.[2] The victim's race/ethnicity allows for tests of whether the effect of immigration on levels of homicide varies across groups, a practice that is common among studies on this topic (Martinez et al. 2008; Martinez and Stowell 2012; Stowell 2007; Stowell et al. 2012).

The homicide events for each of the time periods were aggregated into census tracts based on the 2010 boundary definitions. To enhance the stability of our findings, all homicide events as well as the count of victims by race/ethnicity (non-Latino White, non-Latino Black, and Latino) were aggregated over the 10-year period preceding the decennial census year. For example, the number of homicides in 2010 are the killings that took place from 2001 to 2010.[3] The pooling of data to ensure estimates are robust against annual fluctuations is a frequent practice for neighborhood-level studies generally and research on immigration and crime specifically (Lee 2003; Lee et al. 2001; Martinez and Stowell 2012).

These aggregated homicide counts were matched to tract-level data files provided by Neighborhood Change Data Base (NCDB) (Geolytics 2013). The NCDB is an ideal source for the purposes of this study because they offer consistently measured indicators and an identical boundary definition for each time point. In this case, all of the tracts have been normalized to the 2010 tract definitions as identified by the U.S. Census Bureau. Using a uniform boundary across the period under investigation eliminates the possibility that our findings may be spurious—an artifact of temporal shifts in boundary definition—rather than substantively meaningful.

The independent variables included in the analytical models follow closely those that have been used in previous research. The neighborhood-level indicators are consistent with those employed in studies based on social disorganization theory and specifically those included in the most recent study over a shorter period for the city of San Diego (see Martinez et al. 2010; Sampson and Morenoff 2004 for city of Chicago). Specifically, the

[2] Across the five time periods, we were able to match geographically approximately 94 % of the homicides, well above the recommended minimum of 85 % (Ratcliffe 2004). This high "hit rate" and the fact unmatched cases were dispersed across all time periods, suggests that the missing cases will not influence our findings.

[3] Aggregation over these periods was necessitated by the relatively low homicide rate (and low number of homicides) in the city, particularly in the first and last time points. An anonymous reviewer suggested that we run additional analyses in order to verify that the aggregation for the earliest period did not generate anomalous findings. Specifically, it was suggested that we (a) run the models excluding the 1970 time point; and (b) run the models with homicides aggregated over a shorter period (1965–1969). In a separate series of analyses, we ran all regression models (both primary and supplemental analyses) following both suggestions—in all cases the results were substantively similar, particularly for the effect of immigration on homicide. For this reason, all of the results include the earliest time period.

key predictor in this study is immigration, which we define here as the percent of the population born outside of the United States.[4]

It is also necessary to control for neighborhood levels of socioeconomic disadvantage, as this has been found to be a consistent and robust predictor of lethal violence (Lee et al. 2001; Martinez and Stowell 2012; Sampson et al. 2005). The construct used to capture this structural characteristic of communities is an index composed of three variables: the percent of the population living in poverty; the percent of families headed by females who reside with minor children (those under the age of 18); and the percent of households receiving public assistance. The disadvantage index is the sum of standardized scores for each of the three indicators. It is also important to control for community affluence, as has been shown to be inversely related to levels of violence. For this reason, we include a measure of professional employment, operationalized as the percent of the population aged 16 and older who are employed in a professional or managerial occupation.

Another key neighborhood feature, which is important to control, is the level of residential stability. This factor taps into a dimension of communities argued to be an important predictor on levels of criminal violence (Shaw and McKay 1942/1969). Included in our models is an index on the percent of owner occupied housing units and the percent of the population that has lived in the same residence for the past 5 years. Similar to the disadvantage index, this indicator was constructed as the sum of standardized scores for both variables. Another theoretically important neighborhood condition for which we control is racial/ethnic heterogeneity. The specific measure we employ is the Neighborhood Diversity Index, a measure which is computed using the size of the four largest racial/ethnic groups in each community (non-Latino whites, non-Latino blacks, Latinos and Asians) (see Manly 2000).[5] This measure is ideal for our purposes, because it provides more comprehensive information regarding "the nature of racial settlement patterns" than single racial/ethnic indicators (Manly 2000, p. 38).[6] The final control variable in our models is a proxy for the presence of networks of informal social control in communities. To address this aspect of communities, we construct an indicator that is the ratio of the number of adults (those aged 18 years and older) to children (those aged 17 years and younger).

## Model Estimation

In order to make best use of the panel structure of these data, the analytical models will be run using a fixed-effects regression technique. This procedure is well suited in the present study for several reasons. First, it allows for the examination of the effect of immigration

[4] Of course we are not able to determine variations within immigration status or even types unique to the border. But use this global measure as a rough proxy for immigration.

[5] The Neighborhood Diversity Index is computed using the following equation:

$$ND = \frac{1}{2}(|C_w - T_w| + |C_B - T_B| + |C_H - T_H| + |C_A - T_A|)$$

where C is the city-wide percentage for a given racial/ethnic group (Non-Hispanic white; Non-Hispanic Black; Hispanic; or Asian) and T is the percentage for a racial group in a tract (see pp. 40–41).

[6] Interpreting the Neighborhood Diversity Index, Higher values indicate more homogenous (i.e., segregated) neighborhoods. Note that because we were not able to obtain reliable measure for the Asian population in 1970, we impose a linear interpolation of the Neighborhood Diversity Index for the earliest time point. The results from the analyses do not differ substantively when similar analyses are run that do not include the 1970 period. See Appendix 1.

on homicide temporally, that is, these models capture the degree to which changes in immigration are associated with changes in neighborhood-levels of homicide over time. Studies that examine this aspect of the relationship are scarce in the research literature (for exceptions see Martinez et al. 2010; Ousey and Kubrin 2009; Stowell et al. 2009). An added benefit to the fixed effects modeling is that it focuses exclusively on within-unit change, a procedure that controls for temporally stable community characteristics, even without explicitly including them in the regression models. This is important because the implicit (and non-parametrized) statistical controls can reduce the generation of biased estimates that often accompany misspecified models (Allison 2005). Thus, we believe that the fixed effects estimation technique is ideally suited for the present study since it addresses the primary research question, while increasing the likelihood of making valid causal inference from the findings.[7]

With the dependent variable defined as the number of homicides committed in a community, the models are estimated using an event-count regression technique. Specifically, because there is evidence of overdispersion in these data, we will estimate negative binomial regression models (Long and Freese 2006; Osgood and Chambers 2000). In each of the models, the size of the population (either total or race/ethnic specific) is included as the exposure variable. It is important to include this variable in the regression statement because it controls for the size of the population at risk, without estimating a parameter for the effect. Finally, we also conduct a series of analyses in which the percent foreign-born is included as an endogenous predictor of lethal violence. To do this, we estimate our models using a variety of instrumental variable techniques in an effort to capture the dynamic nature of immigration as a social process and to quantify accurately its temporal influence on homicide levels.

## Descriptive Analysis

As noted by Martinez et al. (2010), a longitudinal analytical design is predicated on the notion that neighborhoods experienced notable compositional and social structural changes during the time period under investigation. This is particularly relevant given that it is an examination of the relationship between immigration and crime using the 2010 neighborhood census boundaries. Table 1 contains descriptive statistics for the city of San Diego by decade. The results confirm this expectation, since 1970 the average tract population has nearly doubled. At the same time, the size of the foreign-born population in the average neighborhood has nearly tripled, growing from 7.5 to 24.5 %. Community structural characteristics have also transitioned, where we see that by 2010 neighborhoods tended to have a larger share of the working aged population working in a professional capacity. It is also clear that the neighborhoods in the city, on average, were somewhat more socioeconomically distressed, somewhat more racially/ethnically homogeneous, and a bit more residentially unstable in 1970 than they are currently.

With respect to the rates of lethal violence, we also observe notable fluctuations over time and across groups. The rates for each group follow city (and national) trends for this time period. Also, the homicide rates overall and for each group followed city (and

[7] The fixed effects regression models drop observations for which there is no variation over time. The most common source is communities that experienced zero homicides in any of the time periods. We do not believe that omission of these neighborhoods is problematic because the focus of this analysis is on quantifying changes in homicide as a result of structural changes in communities (see Martinez et al. 2010, 815).

**Table 1** Descriptive statistics, San Diego neighborhoods, 1970–2010

| | 1970 | 1980 | 1990 | 2000 | 2010 |
|---|---|---|---|---|---|
| Homicide rates | | | | | |
| Total | 4.51 | 10.77 | 9.25 | 3.88 | 1.87 |
| White | 3.30 | 6.80 | 4.61 | 1.92 | 1.21 |
| Black | 20.26 | 25.52 | 19.70 | 10.19 | 6.08 |
| Latino | 0.99 | 14.96 | 18.89 | 5.12 | 1.15 |
| Adult/child ratio | 4.46 | 5.19 | 8.35 | 6.02 | 7.03 |
| Disadvantage index | 0.34 | 0.34 | 0.39 | 0.40 | −0.11 |
| Stability index | −0.24 | −0.16 | −0.14 | −0.31 | −0.12 |
| Percent professional employment | 21.47 | 19.42 | 21.31 | 25.23 | 25.79 |
| Percent foreign-born | 7.50 | 15.44 | 19.83 | 23.95 | 24.47 |
| Neighborhood Diversity Index[a] | 19.75 | 21.71 | 26.57 | 29.38 | 29.58 |
| Total population | 2474 | 3076 | 4137 | 4552 | 4788 |
| N | 314 | 314 | 314 | 314 | 314 |

[a] 1970 values derived from linear interpolation

national) trends over this time period. Rates of lethal violence rose from 1970 through 1980, peaked in the 1990s and continued to decline through 2010 (see Blumstein and Wallman 2000). Consistent with previous findings, homicide victimization rates in the city were highest among Blacks, followed by Latinos, with Whites experiencing the lowest homicide risk (see Martinez 2015; Martinez et al. 2010). Taken together, the results from the descriptive analysis indicate that an analytical model, which takes into consideration temporal changes, is warranted.

## Multivariate Analyses

Turning now to our analysis of total homicide victims, the initial results can be largely viewed as an extension of the analyses presented in previous studies (Martinez et al. 2010). The baseline models are beneficial because they represent a starting point to verify that the general temporal association between immigration and crime holds when considering a broader period of time. Further, what is notable about these results is that we include a more inclusive measure of racial/ethnic heterogeneity, one which considers the distribution of the four primary racial/ethnic groups across communities. This is an important advancement, as such a measure has not yet been widely included in criminological studies on this subject.

In Table 2 we see that changes in neighborhood compositional and social structural factors have had an important, and consistent, impact on patterns of lethal violence over the past five decennial census periods. The findings presented in Table 2 shows support for prior research on this topic, as well as theoretical expectations. Indeed, increases in levels of economic disadvantage are associated with increases in the total number of homicide victims, a finding initially advanced by disorganization theorists, and one that has been confirmed repeatedly in the empirical literature (Lee 2003; Martinez et al. 2010; Shaw and McKay 1942/1969; Stowell et al. 2009). Similarly, we also observe the expected inverse association between stability and homicide, indicating that reductions in killings were

**Table 2** Fixed effects negative binomial regression of total homicide victims on neighborhood structural factors, San Diego, 1970–2010

| Variable | Total | |
|---|---|---|
| | B | se |
| Intercept | −8.577 | 0.277*** |
| Adult/child ratio | 0.001 | 0.002*** |
| Disadvantage index | 0.116 | 0.024*** |
| Stability index | −0.195 | 0.031*** |
| Percent professional employment | −0.010 | 0.006 |
| Percent foreign-born | −0.018 | 0.005*** |
| Neighborhood Diversity Index | 0.016 | 0.004*** |
| N | | 1520 |

Total populations included as regression exposure variable

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

associated with growth in neighborhood residential stability. This latter finding is also one hypothesized as a key indicator of disorganization, although it has received mixed empirical support. One hypothesis for the mixed findings is owing to the fact that it that it is difficult for the theory to generalize to specific local contexts (see Martinez et al. 2008). While we believe there is merit to such an argument, we posit that perhaps previous studies have been unable to quantify this effect because most have relied on cross sectional analytical models. Or, perhaps this effect is more difficult to detect without data collected for a longer period of time, which is a strength in the present study.

Our results also indicate a consistent positive effect of neighborhood diversity on total homicide victimization.[8] However, what we find here is a positive association between homogeneity and homicide; that is, communities that experienced increases in racial/ethnic isolation have more homicides, on average. Although not consistent with theoretical expectations, this finding is not entirely unexpected, as previous research has documented a similar association (see Warner and Pierce 1993). Unlike the findings in previous studies, we find marginal support for the suppressive effect of affluence, measured here as the percent employed in professional occupations, on total homicide victimization ($p < 0.10$ in each case) (Martinez et al. 2010; Sampson and Bean 2006). That is, increases in levels of affluence do not predict fewer homicide incidents, net of other neighborhood structural characteristics. The null finding with respect to our measure of informal social control, the adult/child ratio is not entirely surprising, as this indicator has received limited support in previous studies (see Martinez et al. 2008, 2010). The indicator of central interest for our purposes, the percent of the neighborhood population born outside of the United States also has a negative impact on homicide victimization, a finding that has shown to be robust across an array of various research settings (Lee et al. 2001; Martinez 2015; Martinez and Stowell 2012; Ousey and Kubrin 2009; Sampson and Bean 2006; Sampson et al. 2005; Stowell 2007; Stowell et al. 2009).

Although the impact of immigration is consistent with the body of research on immigration and crime, our results should not be seen as merely confirmatory. We agree that, as Sampson and Bean (2006, 21) argue, "it is no longer tenable to assume that immigration and diversity automatically lead social disorganization and consequently crime." However, what is unique about these findings is that they are the first to include a more comprehensive and theoretically informed measure of diversity. In addition, these results are the first to document the impact of immigration on lethal violence over such a long period of

[8] 1970 values for Neighborhood Diversity Index have been interpolated linearly.

examination. By doing so, that is, by both considering the most recent decade and extending farther back in time, we are able to contextualize this relationship in ways that have not been done previously.

The results from the racially/ethnically disaggregated models are included in Table 3. Generally, there is a high degree of consistency between these models and that for total homicides. For each group, neighborhood disadvantage, residential stability, and neighborhood diversity are significantly associated with homicide victimization, as they were above. Similarly, in none of these models did the percent of the population employed in professional occupations or ratio of the size of the adult population to that of children emerge as significant predictors of the number of killings.

We also find that neighborhoods experiencing increases in the concentration of foreign-born individuals tend to be less violent. More specifically, our results indicate that for each of the racial/ethnic groups, homicide victimization was reduced significantly as a product of increases in the neighborhood concentration of foreign-born individuals. On balance, a similar set of results were reported in a previous study of San Diego neighborhoods, but over a shorter period of investigation (see Martinez et al. 2010). In addition to the support we find for the inverse association between immigration and crime over an extended period of time, we also find similarly consistent support for the fact that neighborhood diversity, specifically homogeneity, is an important predictor of levels of lethal violence. It is the latter finding that helps to advance current knowledge on this topic.

## Supplemental Analyses

A second important contribution that the present study makes to the existing literature is in the way that we model the effect of immigration on levels of homicide. Traditionally, this relationship has been modeled as an exogenous, direct effect between immigration and lethal violence. Such a practice is limited in that it assumes that immigrant residential settlement patterns are independent and not influenced by other community characteristics. However, a more recent trend in the immigration and crime literature is the treatment of immigration as an endogenous cause of crime (MacDonald and Saunders 2012; Ousey and Kubrin 2014; Schapp 2015). This is an important consideration because prior studies have documented that it may not be appropriate to model the effect of immigration as an

**Table 3** Fixed effects negative binomial regression of racial/ethnic homicide victims on neighborhood structural factors, San Diego, 1970–2010

| Variable | Black | | White | | Latino | |
|---|---|---|---|---|---|---|
| | B | se | B | se | B | se |
| Intercept | −6.903 | 0.317*** | −8.577 | 0.277*** | −7.598 | 0.285*** |
| Adult/child ratio | 0.003 | 0.002 | 0.001 | 0.002 | 0.001 | 0.001 |
| Disadvantage index | 0.146 | 0.025*** | 0.116 | 0.024*** | 0.105 | 0.023*** |
| Stability index | −0.300 | 0.042*** | −0.195 | 0.031*** | −0.279 | 0.035*** |
| Percent professional employment | −0.011 | 0.008 | −0.010 | 0.006 | −0.009 | 0.007 |
| Percent foreign-born | −0.016 | 0.006*** | −0.018 | 0.005*** | −0.019 | 0.005** |
| Neighborhood Diversity Index | 0.020 | 0.005*** | 0.016 | 0.004*** | 0.016 | 0.005*** |
| N | | 1405 | | 1520 | | 1517 |

Total or race/ethnic specific populations included as regression exposure variable

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

exogenous process because, as Ousey and Kubrin (2014: 471) argue "immigration flows are selective and may be informed, in part, by crime rates" at least at the city-level. The concern is that findings from studies that do not consider this possibility may be overstating the effect of immigration on levels of criminal deviance (MacDonald et al. 2013). In a series of supplemental analyses, we follow methods used in previous studies in modeling the effect of immigration as an endogenous predictor of homicide.[9] In the interest of being thorough in our examination of this process, we employ two separate methods to control for the endogeneity of immigration. The first method represents a novel approach pioneered by MacDonald et al. (2013) to model selectivity at the neighborhood-level.[10] The second approach follows the more conventional modeling procedure used for panel data, such as those used in the initial analyses reported earlier. We report the results for both, with the idea that the consistency of results will add confidence to our findings. More substantively, we argue that these analyses will contribute to a broader understanding of this process over a substantial period of time in a city that has been an important context for examining the relationship between immigration and crime.

Table 4 includes the findings from the initial methodology, which are informed by the method employed by MacDonald et al. (2013),[11] in which changes in homicide rates are predicted using an array of structural factors taken from the decennial censuses and an instrumented indicator of percent foreign-born.[12] Specifically, the measure of immigration is a predicted value, derived from regressing percent foreign-born on the lagged value of foreign born and a series of social-structural indicators (disadvantage index, percent of professional employment, residential stability, and percent of foreign-born in 1970).[13] To control for within tract changes, we also run the initial models both with and without controls for fixed effects, which in our case are dummy variables for all of the tracts in the city minus one (i.e., J − 1 tract dummy variables) (see Ousey and Kubrin 2014). The results from these analyses are consistent with those discussed above and those reported in previous studies. In both cases of the model without fixed effects (Column 1) and when the fixed effects are introduced (Column 2), we see that immigration still emerges as a significant predictor of levels of homicide. That is, the percent foreign-born is associated with

[9] At present, there is no established protocol for estimating fixed effects negative binomial regression models including instrumental variables. Nor have the statistical properties for such analytical approaches been established. As such, the dependent variable in the following models is logged homicide rates. This is a similar approach to that used by MacDonald et al. (2013). Further, in the following models we focus on total homicide rates because endogeneity analyses for each group reveal a highly consistent set of results (see Appendix 1).

[10] The method of MacDonald et al. (2013) is particularly informative for the current study, as it is the first study of immigration and crime conducted at the neighborhood level to include instrumental variables for immigration.

[11] An anonymous reviewer suggested that we run the models using fully-standardized measures for our independent variables, as a means of capturing the effect of overall change on levels of lethal violence, rather than relative changes in structural characteristics between subsequent time points. The results from t these analyses are presented in Appendix 2. What we see I from these results is that overall increases in the size of the foreign-born population are associated with reductions in levels of homicide, net of other community characteristics. These findings underscore the robust effect of immigration, indicating that absolute changes in immigration, are linked to reductions in the number of killings. Note: the 2SLS models were run using the same analytical approach, which yielded similar effects as those reported in Table 5 (results available upon request).

[12] We include percent the 1970 percent foreign-born following Ousey and Kubrin (2014). The effect of the instrumented immigration measure is substantively identical when the 1970 percent foreign-born is omitted.

[13] See MacDonald et al. (2013, 201) equations 5 and 6.

**Table 4** Effect of immigrant concentration and social structural factors on changes in overall homicide rates, San Diego, 1980–2010

| | 1 | 2 |
|---|---|---|
| Predicted percent foreign-born | −0.011** | −0.036* |
| Disadvantage index | 0.098*** | 0.088*** |
| Residential stability | 0.094*** | 0.074 |
| Adult/child ratio | −0.010** | −0.009 |
| % Professional employment | −0.015*** | −0.056*** |
| Total population (ln) | −0.129* | −1.104 |
| Neighborhood Diversity Index | −0.012*** | 0.003 |
| Constant | 1.947*** | 3.417*** |
| Fixed effects | No | Yes |

Because the immigrant concentration measure includes lagged values, information from 1970 is not included in the analysis

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

significant reductions in total homicide rates, indicating that even when treated as an endogenous predictor, the effect of immigration does not attenuate.

In the next series of analyses, we estimate models that also predict changes in total homicide rates, but using a more traditional 2SLS technique. In the first two columns of Table 5, the measure of immigration is instrumented on social structural characteristics of communities and the temporal lag of percent foreign-born, as was done above. The indicator of immigration in the last two columns also includes the percent of foreign-born residing in the neighborhood in 1970 as an additional excluded instrument. In columns 2 and 4, we introduce fixed effects, to control for the unobserved, time-stable characteristics of communities.

The results from the 2SLS analyses share a high degree of consistency with those reported in the previous table. Of most interest for our purposes, we again see that our measure of immigration has a significant inverse association with homicide rates; both with and without controlling for fixed effects and introducing the percent of foreign-born living in a given neighborhood in 1970. These findings resonate closely with the only other existing community-level study on this topic, in that the effect of immigration is found to be an endogenous, and a statistically meaningful predictor of changes in rates (MacDonald et al. 2013). The regression diagnostics also suggest that it is appropriate to model the impact of immigration on crime as an endogenous process. More specifically, we find evidence that immigration is endogenous, as indicated by the fact that all of the tests in each of the models are significant (each to at least $p < 0.01$). The same is also true for the under-identification test, which confirms that the models are identified, or that the excluded instruments are associated with our endogenous measure of immigration. The results from the Stock-Yogo test indicate that the excluded instruments are more than weakly associated with the endogenous variable, as the test statistics exceed critical values for weak identification. In sum, we feel that the results from our supplemental analyses confirm the endogenous nature of the process of immigration. However, this does not obscure the larger picture that the present study finds that immigration is associated with significant reductions in community levels of lethal violence. Stated more succinctly, as Ousey and Kubrin argue (2014: 473), "the substantive pattern evident in these results is familiar."

**Table 5** Instrumental variable (2SLS) models predicting overall homicide rates, San Diego, 1980–2010

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Percent foreign-born | −0.013** | −0.034** | −0.012** | −0.104** |
| Disadvantage index | 0.100*** | 0.077*** | 0.093*** | 0.036 |
| Stability index | 0.093*** | 0.063 | 0.092*** | −0.122 |
| Adult/child ratio | −0.010** | 0.007 | −0.009** | 0.001 |
| Percent professional employment | −0.015*** | −0.038*** | −0.016*** | −0.053*** |
| Neighborhood Diversity Index | −0.011*** | 0.001 | −0.011*** | 0.023 |
| Total population (ln) | −0.091 | −1.153*** | −0.102 | −0.981*** |
| Constant | 1.625** | 11.300*** | 1.714*** | 10.870*** |
| Fixed effects | No | Yes | No | Yes |
| Instrumental variable tests | | | | |
| Endogeneity Chi square test | 6.318** | 12.73* | 6.607** | 12.07*** |
| Underidentification LM test | 273.2*** | 110.2*** | 308.9** | 22.13** |
| Weak identification *F* test | 158.3[a] | 13.44[b] | 174.9[a] | 3.278[b] |

*** $p < 0.01$; ** $p < 0.01$; * $p < 0.05$

[a] Test statistic exceeds Stock-Yago weak identification critical value (10 % of maximal IV size)

[b] Test statistic exceeds Stock-Yago weak identification critical value (15 % of maximal IV size)

Again, we feel that it is important to stress the uniqueness of our findings. With respect to the relationship between immigration and violence, our results show continued support for the notion that over time, "that more immigrants means less crime." In no case did we find empirical evidence that the influx of foreign-born individuals could (or should) be considered a disruptive social process. The weight of the evidence suggests that, over the past five decennial census periods, the exponential increase in immigration in this border city is not associated with an increase in homicide victimization. Our results indicate quite the opposite, that even when examined through a wider temporal lens than is typically employed, making use of a more comprehensive measure of neighborhood heterogeneity, and also accounting for the endogeneity of immigrant residential settlement, we find no support for the claims that immigration is a crime generating social process.

## Conclusions

Over the past 40 years the United States has experienced a steady influx of immigrants crossing into and through southwestern border cities such as San Diego (Montejano 2010). Our analysis sought to illuminate the temporal link in neighborhoods between crime and immigration while drawing from contemporary research revealing an inverse association between the presence of newcomers and lethal violence (see Lee et al. 2001; Martinez 2002; Martinez et al. 2008; Sampson 2008; Sampson and Bean 2006; Sampson et al. 2005; Stowell 2007). Traditional wisdom holds that the shifting population structure would contribute to higher levels of criminal violence (cf. Schuerman and Kobrin 1986). Contradicting that notion we found that since 1970 more immigration means fewer overall homicides.

Furthermore, the results are relatively robust, as increases in immigration also correspond to fewer homicides in San Diego communities. The transformation of San Diego into an increasingly Latino (and Asian) immigrant city has contributed paradoxically to

lower levels of lethal violence. Over time, increasingly marginalized poor Latino (Chicano) communities across the southwestern United States since 1970 displayed more youth homicides as some young residents turned to crime rather than protecting turf (Montejano 2010). That too eventually ebbed. Not all groups, of course, shared the benefits equally, as the proportion of the foreign born was not as strongly related to reductions in levels of Black homicide (particularly when the endogenous process of immigrant settlement is controlled; results available upon request). A likely explanation for this result is the fact that newcomers from abroad are not settling into traditionally Black neighborhoods in numbers that would have a meaningful impact on levels of homicide (Sampson and Wilson 1995). Like many other southwestern cities, Blacks/African Americans are the fourth largest racial/ethnic group suggesting that perhaps relative deprivation or isolation contribute to this finding. We suggest that future research explore this question in more detail, with appropriate attention given to our finding that not all causes of crime are racially/ethnically invariant.

Temporal change is a central part of the suppressed crime story in communities that have experienced increases in immigration and has been missing from the largely cross-sectional research that has been conducted to date. Disorganization is still associated with increased homicide, as our findings for economic deprivation and instability indicate. But immigration does not seem to be central to the disorganization process in San Diego during the closing decades of the twentieth and start of the twenty-first century. If Shaw and McKay (1942/1969) were conducting research today in southwestern cities, then their inductive approach likely would have convinced them that perhaps various types of disorganization exist. Time matters and local context still matters, including in disorganized border cities reminding us that the early 1900s is different than early 2000s in many ways. By sensitizing researchers to this possibility, updating social disorganization theory can help point the way to a more complete understanding of urban crime. After all, the social disorganization approach focused on the intervening mechanism of social control in its explanation of crime. Although we cannot test this notion directly, our results suggest that scholars should consider seriously the possibility that immigration is not inhibiting social control, at least in border cities like San Diego.

Similarly, we believe that scholars should collect data for a wider array of cities in addition to those like San Diego, which are on or by the U.S.-Mexico border. Because perceptions about border issues color public discourse and, consequently, policy decisions, it is increasingly important to understand the impact of immigration on levels of violence in border communities. Conversely, we might find that local conditions continue to trump general predictions (Martinez et al. 2004). We are also aware that the unique border crossing experience is not adequately captured in a global measure of immigration. Regardless, we would hope that subsequent studies use longitudinal data to avoid the problems that we have identified with cross-sectional research.

Finally, we suggest that future longitudinal work explore types of crime other than homicide. Although lethal violence is an enduring public concern, some anti-immigrant rhetoric is addressed to nonlethal violence and property crime. We believe that it is important for research on immigration to continue to play an important role in a range of criminological- and social scientific research initiatives. Much like a century ago, movement from abroad is behind a dynamic transformation across the nation. With the changing demographic landscape, scholars are presented with an opportunity to deepen our understanding of patterns of crime in American communities and whether they are shaped by the arrival of immigrants. It is our hope that the current study not only contributes to the accumulated empirical evidence but also can be used to inform academic and public policy

discussions on the immigration and violent crime linkage as it unfolds over time. It is only by modeling the underlying dynamic relationships that we can draw conclusions about whether immigration, residential stability, and other structural characteristics of neighborhoods lead to disorganization or not. In this way, we will get to the heart of the community–crime connection, thereby continuing to do justice to the legacy of Shaw and McKay (1942/1969).

## Appendix 1

See Table 6.

**Table 6** Fixed effects negative binomial regression of racial/ethnic homicide victims on neighborhood structural factors, San Diego, 1980–2010

| | Total | White | Black | Latino |
|---|---|---|---|---|
| Disadvantage index | 0.100*** | 0.116*** | 0.133*** | 0.103*** |
| Adult/child ratio | 0.000 | 0.000 | 0.001 | 0.001 |
| Stability index | −0.260*** | −0.198*** | −0.295*** | −0.272*** |
| Percent professional employment | −0.036* | −0.015** | −0.010 | −0.010 |
| Percent foreign-born | −0.020*** | −0.020*** | −0.017** | −0.020*** |
| Neighborhood Diversity Index | 0.024*** | 0.018*** | 0.022*** | 0.016*** |
| Intercept | −7.008*** | −7.518*** | −6.536*** | −7.631*** |
| N | 1227 | 1227 | 1194 | 1225 |

*** $p < 0.01$; ** $p < 0.01$; * $p < 0.05$

Total or race/ethnic specific populations included as regression exposure variable

## Appendix 2

See Table 7.

**Table 7** Standardized effect of immigrant concentration and social structural factors on changes in overall homicide rates, San Diego, 1980–2010

| | 1 | 2 |
|---|---|---|
| Percent foreign-born | −0.164** | −0.636* |
| Disadvantage index | 0.315*** | 0.195*** |
| Stability index | 0.161*** | 0.062 |
| Adult/child ratio | −0.649** | −0.113 |
| Percent professional employment | −0.163*** | −0.539*** |
| Neighborhood Diversity Index | −0.099*** | −1.082 |
| Total population (ln) | −0.011* | 0.009 |
| Constant | 0.274*** | 0.560*** |
| Fixed effects | No | Yes |

*** $p < 0.01$; ** $p < 0.01$; * $p < 0.05$

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