Chicago data

Our analysis utilizes detailed information collected and brought together from various sources. In this section, we discuss characteristics of incidents and offenders, characteristics of census blocks, and the construction of distance measures and spatially lagged census block variables.

3.1. Incidents and offenders The Chicago Police Department recorded 75,065 street robberies from 1996 through 1998 (for an analysis of total robbery counts per census tract, see Bernasco and Block, 2011). Not all these cases result in an arrest. In fact, in the large majority of cases (82.8%), the offenders escape arrest. The present analyses include the 12,938 cleared cases (17.2%) where at least one person was arrested who was a resident of Chicago.

For this study, street robbery included all incidents that occurred in an outdoor public location. The data on these incidents include the date, the time, the number of arrested offenders involved, and the nearest address to where the robbery was committed. About 98.5% of these addresses were successfully geo-coded. Using longitude and latitude, each incident was assigned to 1 of 24,594 census blocks in the city of Chicago. Our sample excludes the robberies that Chicago residents committed outside the city boundaries. In note 5, we demonstrate that this selection does not result in biased estimates. Of the 12,938 cleared robberies, 72% were committed by offenders without accomplices, 20% were committed by a pair of co-offenders, 5% were committed by a group of three offenders, 2% by groups of four offenders and 1% by groups of five of more co-offending robbers. Without doubt, situations occurred where some offenders involved in a cleared robbery were arrested but others were not. This necessarily results in an underestimation of the number of offenders involved in a robbery. Because the discrete choice modeling framework assumes a single decision-making agent, and because we do not have information on the decision-making dynamics in pairs and groups of co-offenders, multioffender groups were treated as single decision-making agents.2 This decision was legitimate given the fact that additional analyses (presented in Supplementary Table S1 of the Supplementary Appendix) showed no statistically significant differences between the parameter estimates of co-offending offenders and those of single offenders. The data also contains information on the 18,114 offenders who have been arrested for committing these street robberies, including gender, racial and ethnic background, age and residential address at the time of the robbery. These addresses were also geo-coded. Offenders who lived outside the city or whose given address did not match a residential address (using property tax rolls) in the city were excluded from geo-coding. Of all the offenders who gave an address in Chicago 95% fit the geo-coding criteria (the remaining addresses did not exist or were nonresidential). The demographic composition of the offender sample in terms of age, gender and racial or ethnic background is displayed in Table 1. Unfortunately, the data did not allow us to identify offenders across multiple robberies. More generally, it did not contain information on prior crimes or past residential addresses of the offenders. Therefore, we must treat robbery location choice as a decision somewhat isolated from the offender’s past experiences.

.2. Census blocks The data further include detailed information on land use, population and activities in all census blocks in the city of Chicago. In 2000, there were 24,736 census blocks in Chicago. The 142 blocks that had no land were excluded from the analysis. The remaining 24,594 blocks have a median size of 19,680 m2 (140 m 140 m). There are 5867 blocks that have no residential function and thus no residents. These blocks include parkways, parks, beaches, cemeteries, factories and other areas that may be surrounded by populated blocks. Since robberies can be committed in blocks without a residential function, they are included in the analyses. A wide range of variables was collected to measure the attractiveness of census blocks for street robbery (see Table 2). To measure the presence of legal cash economies and small scale retail activities in the block, we used marketing information collected by Claritas (www.claritas.com) on businesses in the city. A subset of nine types of shops and businesses was selected for which the proportion of cash transactions is likely to be high, and which had less than 11 employees. They include (1) bars and clubs, (2) restaurants, fast-food outlets and food stands, (3) barber shops and beauty salons, (4) liquor stores, (5) grocery stores, (6) general merchandise shops, (7) gas stations, (8) laundromats and (9) pawn shops, currency exchange and check-cashing services. To measure the local presence of illegal cash economies in the form of drugs, prostitution and gambling transactions, geocoded incident files of the Chicago Police Department of the Years 1996–1998 were aggregated to the census block level. The variables measure numbers of (10) drug-related incidents, which are arrests for soliciting or selling drugs, (11) prostitution-related incidents, which are arrests for soliciting paid sexual services by prostitutes or their customers, and (12) gambling-related incidents, which are arrests for organizing or participating in illegal gambling. All three types of incidents can take place on the streets, in public buildings or private residences. The accessibility of a block is measured by two indicator variables, namely (13) whether the block is located along at least one main street (rather than only minor streets), and (14) whether the block contains a station of the El, the Chicago elevated railway system. Data on (15) the presence of private and public high schools in a census block were based on lists compiled by the Chicago Public Schools. Table 3 presents the correlations between the above 15 variables. Note that most correlations are positive and small to medium in size, indicating a slight tendency for small legal and illegal businesses to be co-located in the same blocks. Information on block population was obtained from the US 2000 Census. It includes (16) the total number of residents in the census block and the racial and ethnic composition of the population. The population size and the racial and ethnic composition (17) were used to create a five-category classification of each block, i.e. (a) population 20 or less (b) majority African-American, (c) majority White, (d) majority Hispanic and (e) mixed racial and ethnic composition. The majority threshold was defined as 75%.

3.3. Geographic measures For each offender the Euclidian distance was calculated between their home and the midpoints of each of the 24,594 census blocks. The typical distance decay pattern of the distances between the offender’s home and the block where they perpetrated the robbery is displayed in Figure 1. To measure characteristics of the local environment of a census block, a GIS system was used to define for each block the sets of first- and second-order adjacent blocks. Two blocks were defined to be mutually first-order adjacent if they shared a border or a single point. For example, each of the four blocks around an intersection is adjacent to the other three. Two blocks were defined second-order adjacent if they were not first-order adjacent and if both were adjacent to a third block. Subsequently, for each of these 24,594 blocks the values of each of the first 16 variables defined above were summed across the first-order adjacent blocks and across the second-order adjacent blocks. The 2 16 new first- and second-order spatially lagged variables defined potential crime attraction in the local environment of a block, excluding the focal block itself.