



CORRELATES OF CRIME IN URBAN MAKURDI, NIGERIA

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This study examined the social and physical correlates of crime in Makurdi town with a view to predicting their influence on the emerging crime pattern especially in a rapidly developing city in the global south. The study sought to provide insights on the pattern of crime and the key determinants of the distribution of opportunities for crime within the built environment, using Makurdi, Nigeria as the case study. To achieve this, the study utilized the survey research design to obtain data on social and physical attributes of the study area. Makurdi residential areas were divided into fifty-seven spatial units and a total of seven hundred and sixty-eight structured questionnaires were administered on household heads. The aggregated social and physical variables were regressed against the levels of victimization, theft, rape, assault, burglary and armed robbery so as to identify the major correlates of these crimes. The results suggest that age is a predictor of incidences of victimization and burglary while the age of buildings had a significant influence on incidences of victimization. Building density was linked to incidences of victimization and rape. Income and employment status were predictors of theft and assault while fences and houses with open frontages significantly influenced the occurrence of armed robbery and assault. The results of the analysis have given credence to the surveillance principle and the need for capable guardians as advanced by proponents of crime prevention through environmental design and the routine activities theory.

Keywords: crimes types, Makurdi town, physical factors, social factors, urban crime, victimization

INTRODUCTION

One of the major findings of crime and place studies is that crime is spatially clustered (Hewitt, Beauregard, Andresen and Brantingham, 2018). Thus, over the years, researchers have sought to understand why there is such a concentration of different types of crime in particular areas. Hillier and

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Sahbaz (2008) provide an explanation for this by arguing that different crimes are facilitated by different kinds of spaces. For instance, street robbery is easier where streets have fewer activities and pedestrian or low vehicular flows on the other hand, burglary thrives in isolated or secluded areas (Hillier, 2004; Groff, 2006). In some areas locating a school in close proximity to a shopping area has the likelihood of increasing incidences of shoplifting and vandalism (Felson and Clarke, 1998; Ligget, Loukaitou-Sideris and Iseki, 2001). This is because such crimes are often perpetrated by young adults especially where the physical layout of the shops hamper visibility.

Researchers in different disciplines tend to focus on different aspects of the problem. Sociologists and criminologists have tended to focus on the social components; geographers, architects and urban planners have given prominence to the physical characteristics of the environment in providing insights into the pattern and correlates of crime in cities across the globe. While acknowledging the contributions of the ecological approach mainly adopted by urban planners which focuses on the influence of the physical attributes of the environment on crime, there is the need to also consider the compositional attributes which emphasize the socio-economic and demographic characteristics of the urban dwellers. This is in recognition of the criticism of the one-sided approach termed 'environmental or architectural determinism' used by previous researchers. Critics of the focus on physical correlates argue that the social component has an equally important role in facilitating the occurrence of crime (Schweitzer, Kim and Mackin, 1999). They argue that crime opportunity structures can be determined by socio-economic conditions, demographic characteristics and the spatial configuration of the urban environment. For instance, Merry (1981) argued that the unstable social conditions of an area can undermine the defensibility of an area which was originally designed to be architecturally secure. Thus, the social composition of a neighbourhood or city can influence how the residents organize, use, perceive and act to guard or protect public and private spaces. Integrating both the ecological and compositional approaches is further strengthened by Soja's (1980) socio-spatial dialectic principle which stresses the interdependence of the physical and social components of the environment.

Besides the criticism of the approach adopted by urban planners, Hillier and Sahbaz (2008) observed that widespread beliefs on the correlates of crime abound but little empirical evidence is available to support a well-structured judgement. They noted that "in terms of compelling empirically based studies, the evidence-base is astonishingly poor; and mixed with anecdote and prejudice". For instance, Newman (1972) in a study of housing projects in New York, reported that flats were more susceptible to crime. However, in 1999, Budd subjected the British Crime Survey data to multivariate analysis and suggested that once social and economic factors were considered, flats were the safest dwelling type. Again, Hillier and Sahbaz (2008) noted that Newman's support for and promotion of cul-de-sacs as the safest street type is not backed by empirical evidence.

In a developing country like Nigeria, one of the challenges of controlling crime in urban areas using design or surveillance is the dearth of empirical evidence on the physical and social characteristics that create opportunities for the occurrence of crime. Few, if any studies interrogate the pattern and correlates of crime in African cities generally and Nigeria in particular. The available studies also tend to utilise police records which are aggregated at larger scales (state) and not helpful for micro (street) or macro (neighbourhood) levels of analysis that take into account the context of crime. For instance, Kunnuji (2016) used police crime records for all the states in Nigeria in a study of the influence of population density on armed robbery. Though relevant, the study fails to recognise that even within individual states, there may be variations in the distribution of both population density and incidences of armed robbery across cities and neighbourhoods. The adoption of a large scale of analysis leads to generalisations that limit the utility of the findings of the study; especially in regards to allocation of resources and the design of crime control measures for specific crime hotspots. Thus, the prospects of enhancing safety through effective urban planning have remained untapped largely due to a lack of awareness propelled by inadequate research. Consequently, studies that unravel the different correlates of crime are necessary for understanding crime occurrence and distribution; in addition to providing guidance to urban planners for the design of safe neighbourhoods by avoiding environmental conditions that could facilitate crime. The knowledge generated could also contribute to effective policing and allocation of limited resources in promoting the safety of urban residential environments and the inhabitants. This paper therefore fills these gaps and contributes to the environmental criminology literature by combining both the physical and social dimensions to provide a more balanced understanding of the correlates of crime in urban areas in Nigeria using Makurdi as the case study.

Makurdi town serves a dual role as the capital of Benue State and the headquarters of Makurdi Local Government Area. The contiguous built-up area constituted the study area. Makurdi is the most populated and urbanized settlement in the Benue State, Nigeria. Its status as the state capital and invariably the hub of economic activities also makes it attractive to those seeking opportunities for better livelihoods and living conditions. In recent times, Makurdi is witnessing rapid population increase, accompanied by physical growth and expansion. The increase has been due largely to the influx of displaced persons from rural communities in Benue State that are currently engulfed by the farmer-herder conflicts. The concentration of people and activities in Makurdi town is likely to generate social vices such as crime; making it a suitable research site. Specifically, this study sought to address these questions: what is the pattern of crime in Makurdi? What are the social and physical correlates of crime in Makurdi urban area?

LITERATURE REVIEW

Researchers in the global north have expressed views on the relationship between crime and the environment. The findings from some of these studies

are highlighted in this section. Newman, an Architect and one of the pioneers of crime prevention through urban design linked certain factors such as building heights and orientation of houses to the volume of crime (Newman, 1972). Block and Block (1995) observed that land uses such as liquor stores, taverns, pawn shops, pool halls, vacant lots and abandoned buildings act as crime generators. Ackerman (1998) suggests that urban crime occurs mostly in areas with disproportional concentration of poverty, unemployment and minority populations. Other researchers including Schweitzer, Kim and Mackin (1999); Nubani and Wineman, (2005) and Wang, Dhiman, Eck and Russell, (2008) concluded that socio-economic status, youth concentration, racial composition or ethnicity, level of education, social class, tenure, environmental factors such as street configuration, land use types and arrangement of buildings are positively correlated with crime rates. The UN-HABITAT (2007) noted that land use juxtaposition, street layout, building and site design, transportation systems, infrastructure improvement especially lighting and landscape maintenance and the use of public spaces have different levels of influence on the occurrence and fear of different types of crime. Loukaitou-Sideris et al (2002) found that crime rates in Los Angeles were higher at bus stops in areas with alleys and mid-block passages and near multifamily housing, liquor stores, vacant buildings and buildings marked by graffiti and litter. It has also been suggested that multifamily housing areas are more susceptible to crime than single family housing areas. Commercial and industrial areas have been identified as the land use types that are most attractive to crime while residential areas are considered the least attractive to crime and victimization (Ligget, Louikatou-Sideris and Iseki, 2001).

Uittenbogaard (2013) reported that mixed land uses, low guardianship and poor visibility at rail stations in Stockholm led to increases in crime rates. In a study in Mozambique, Barslund, Chiconela, Rand and Tarp (2005) observed that larger families and individuals living in areas with high levels of unemployment have higher chances of being victimized. The study in Mozambique also found that young, unmarried males with low income have higher risks of victimization because they are active in the public domain. Barslund et al (2005) argue further that the probability of being a victim of crime can be a function of indicators relating to income, level of education and employment status. The effect of income on victimization risk is highly dependent on the type of crime. Higher income lowers the chances of being assaulted but could heighten the risk of burglary or armed robbery. This suggests that income is a better predictor of property crime than it is of crime against persons or contact crimes.

Perkins, Meeks and Taylor (1992) observed that areas with vacant lots or buildings, public parks and schools are attractive to youth and gang related crimes. Nubani and Wineman (2005) studied geographical patterns of four types of crime (burglary, larceny, vehicle theft and robbery) using space syntax measures of accessibility. The study found that lower crime levels were associated with high youth concentration and home ownership in the neighbourhoods in Ypsilanti, Michigan. Zhong, Yin, Wu, Yao, Wang, Lv and

Yu (2011) examined the relationship between land use types, population (permanent and transient) and crime rates in Shanghai, China. The study reported that crime rates were higher in residential areas while both property and violent crimes are closely related to permanent and transient population. Shu (2009) found that road types, the dwellings' front door to front door inter-visibility and the degree of road accessibility had a highly significant influence on the distribution of burglary. The study further indicated that segregated areas allowing fewer passers-by are more vulnerable to burglary as compared to integrated areas where there are more pedestrian and vehicular flows. This finding justifies Jacobs' (1961) assertion that pedestrian flows provide informal surveillance necessary for safe streets. Unlike Newman (1972) who suggested that cul-de-sacs are safer, Shu (2009) reported that cul-de-sac complexes had a higher disposition to burglary than through grid systems. Employment deprivation and housing types have also been associated with the incidences of residential burglary. Based on studies in the United Kingdom, Hillier and Sahbaz (2008) reported that detached houses were more vulnerable to residential burglary whereas flats were safer. The study also found that higher housing and population densities were associated with lower rates of residential burglary. This finding appears to contradict widespread beliefs and other studies that link crime with higher densities.

Miethe and Meier (1994) analysed rates of rape in cities across the United States and found that it was concentrated in areas characterised by high levels of population mobility, ethnic heterogeneity, single-parent-households and unemployment. Hewitt et al (2018) investigated the determinants of sexual crime in Canada and found that socio-demographic and ecological factors were significant predictors of the crime. Specifically, females aged fifteen or older, males aged fifteen to thirty-four, single individuals, renters, liquor establishments, schools and population had positive relationship with sexual crime. This implies that an increase in the percentage of these variables was associated with an increase in the number of sexual crimes. On the other hand, post-secondary education, increase in median income and percentage of individuals who moved into each dissemination area within the past year (transiency) had a negative influence on sexual crimes. This suggests that where these factors increased, there were lower counts of reported sexual crime.

In Africa, Mokhuwa (2014) reported that population density and percentage of female-headed households had a positive relationship with aggravated robbery, theft, assault and burglary in Tshwane Municipality, South Africa. The study also found a negative association between percentage of owner-occupied homes, residential stability and all crime types investigated. These results suggest that areas with higher population densities and female-headed households were more vulnerable to crime while areas with more home owners and less residential mobility/transiency had lower proclivity to crime. Median income had a weak negative relationship with assault; implying that there were lower incidences of assault in the more affluent areas of the municipality. This finding is similar to the position held by

Barslund et al (2005) that high income lowers the probability of being assaulted. Unemployment had a weak positive relationship with contact crimes and a weak negative relationship with property related crimes. This means that unemployment contributed in creating areas in Tshwane Municipality that were susceptible to contact crimes such as assault. Using the 2006 nationwide crime data, Kunnuji (2016) interrogated the relationship between population density and armed robbery in Nigeria. The study found that there were higher rates of crime in the southern states as compared to the northern states. The study further reported that population density was a predictor of the volume of crime but it had no significant influence on the rate of crime. As mentioned earlier, the scale of analysis used in this study was large and as Brantingham and Brantingham (1975) rightly observed, large spatial aggregations could conceal important patterns that may exist within smaller spatial units'. Umar (2017) in a study of the pattern of crime in Kaduna state, Nigeria found that neighbourhoods with lower estimated socio-economic status were more likely to experience higher rates of theft. Relatedly, residential mobility and residential stability had a statistically significant positive relationship with breaking and entering (burglary). This finding indicates that areas with high population turn-over and stable communities were more predisposed to breaking and entering.

From the findings of previous studies, it can be seen that some studies have aligned specific social and physical environments with specific types of crime. However, there is a disproportionate representation of studies from the global south. This study therefore, attempts to bridge that knowledge gap by providing insights on the factors that contribute to creating opportunities for crime to thrive from the perspective and context of cities in the global south.

Theoretical Underpinnings

This study derives its theoretical underpinning primarily from three theories; the social disorganization theory postulated by Shaw and McKay in 1942; the routine activities theory of Cohen and Felson (1981) and the defensible space theory of Newman (1972). Let us briefly consider the main features of these theories.

Shaw and McKay's social disorganization theory postulated in 1942 was centred around three sets of variables namely, physical status, economic status and population status. They enumerated the main sources of social disorganization to include low socio-economic status, high residential mobility or population turnover, family disruption and high racial or ethnic heterogeneity. In their study in Chicago, they found that areas with high crime and delinquency rates tended to be physically deteriorated, geographically close to areas of heavy industry and populated with highly transient residents; these areas were also inhabited by people with low economic status and low home ownership (Walker, 2009). In Shaw and McKay's opinion, areas with low affluence produced an environment conducive to delinquency and crime because of the heterogeneous nature of the population which resulted in weak social cohesion.

The routine activities theory by Cohen and Felson (1981) considered the interaction between three variables: the availability of attractive targets, the absence of guardians and the presence of motivated offenders. Attractive targets could be persons or objects while capable guardians could be neighbours, watchful parents, lighting, dogs, patrol officers, guards or security cameras. According to the theory, the timing of work, shopping and recreation creates regular patterns of human behaviour which in turn produce regular patterns of criminal opportunity that influence the spatial and temporal behaviour of criminal offenders (van Nes and Lopez, 2010). The routine activities of people place them in social spaces with higher or lower risks of victimization. For instance, people who spend time in public places at night have a higher risk of being robbed or assaulted than do people who spend most of their evenings at home (Linden, 2007). This provides a probable explanation for the high rates of victimization (particularly for contact crimes) among males between the ages of fifteen to thirty-five. This subset of the population belongs to the upward and mobile class who spend more time in public places including an active nightlife (van Dijk, 2007). Thus, differential exposure to risks is a function of the demographic and socio-economic characteristics of the population which in turn influence the kinds of activities they engage in and the locations they visit. This implies that both the social and physical characteristics of the people and the environment are important in understanding the distribution of crime and victimization.

Cohen and Felson (1981) who proposed the theory presumed that a person's risk of being victimized can be reduced if they alter their patterns of activity. Cohen and Felson argue that increased exposure, lower levels of guardianship especially in areas with single person households, fewer physical guards like locks, gates, dogs and the presence of valuable targets will result in increased risks of victimization. The areas people visit to carry out their routine activities is a function of the spatial organization of land uses within urban spaces. Therefore, it can be inferred that changes in the routine activities of city residents alone is not enough to reduce the exposure to crime; changes in the location of activity areas is equally needed to minimize the opportunities for crime. Against this background, it is expected that where there are more home based work areas, incidences of crime and victimization will be lower. The routine activities theory assumes that areas with land use mix can guarantee the presence of capable guardians when other residents are away at work. Areas with single land use types like residential areas are exposed to crime especially when the residents work away from home. This leaves the residential areas deserted and unguarded during the day. Areas designated as commercial districts are also prone to crime particularly at night after businesses close for the day and the presence of capable guardians is greatly diminished. These illustrations show how opportunities for crime manifest through the presence of attractive targets and the absence of capable guardians.

The defensible space theory is the most central in the link between design and crime. Newman (1972) posited that the physical design of the residential

Figure 1: Makurdi town showing the subdivision of Residential Areas
Source: Author's Fieldwork, 2015

The specific social variables used in this study include age (0-14years; 15-44years and ≥ 45 years), household size, level of education (none; basic = primary or secondary school certificate; and tertiary = above secondary school certificate), income (lower, middle and higher), employment (none, formal or informal), marital status, length of stay in an area, sex of household head, home ownership (home owner or renter) and place of birth (used to identify migrant populations). The physical variables include the percentage of mixed use buildings, size of dwellings which was an indicator for building density, types of dwellings (single or multi-family dwellings), age of the buildings which was used to distinguish between old and recently occupied areas, vacant plots, liquor shops, fences and houses with inter-visibility (front-door-to-front-door visibility). These are variables which have been generally identified in previous studies and by theorists like Shaw and McKay, Newman and Cohen and Felson as major correlates of crime in cities across the globe. They were used in this study to determine whether or not such factors had an impact on criminal victimization and crimes such as theft, burglary, assault, rape and armed robbery in Makurdi town.

Data were also collected on the frequency of victimization as an indicator of the intensity of crime in the communities and the types of crime experienced by residents. Victimization surveys were preferred because the available police records were not disaggregated according to residential areas; making it difficult to establish the concentration of different types of crime. Thus, the police records were unsuitable for the kind of analysis required in this study. The social variables and the crime data were sourced from residents while the environmental components were obtained through physical inventories. A multi-stage sampling design was adopted for data collection. First, a proportionate sampling technique was used in the ratio 50: 30: 20 for high, medium and low building density areas respectively. The ratio was adopted to ensure inclusion and representativeness in the data collection process. Secondly, a point sampling technique was employed to select the households that participated in the study. The target respondents were household heads who had lived in the area for a minimum of six months. This duration was adopted from the annual victimization surveys conducted by the CLEEN Foundation (Alemika, 2013). The questionnaire was administered directly (face-to-face) to the respondents. Out of the eight hundred copies of questionnaire that were administered, seven hundred and sixty-eight were completed and returned.

In the first stage of data analysis, descriptive statistics such as frequency, percentages and the mean were used. Incidences of crime in any residential area that fell between seventy-one and hundred percent were categorized as high intensity; forty to seventy percent was described as moderate intensity while incidences of crime that were from one to thirty-nine percent were said to be relatively low in intensity. Nil or zero was recorded against areas with no incidences of crime. At the second stage of analysis, the aggregated social

and physical variables collected in the fifty-seven spatial units were subjected to the stepwise multiple regression technique using Makurdi town as a single unit of analysis. This was done to identify the operative variables in the dataset with strong associations to incidences and types of crime. The independent variables employed were the social and physical variables. These were regressed against the levels of victimization, theft, rape, assault, burglary and armed robbery which served as the dependent variables. The stepwise regression procedure sifts the variables and removes those that are not important, leaving behind the combinations of independent variables that best predict the dependent variable.

In interpreting the results of the regression analysis, if the p-value is less than 0.05, then the correlation is considered statistically significant. This implies that at 95% confidence level, the relationship between the variables is not due to chance but that the predictor variables have a significant effect on the dependent variable. Such results suggest that the predictors (independent variables) can influence the behaviour or pattern of the dependent variable. On the other hand, if the p-value is greater than 0.05, then at 95% confidence interval, the relationship between the variables is not statistically significant and due to chance. The coefficients of determination (R^2) were useful in understanding the percentage of the variance or fluctuations in the dependent variable (crime) that can be accounted for by the predictor variables (social and physical characteristics). The coefficient of determination is computed as a percentage and it gives the ratio of the explained variation to the total variation. This is useful in determining the level of certainty in making predictions from a regression model. Three levels were defined to aid in the interpretation of the results. When the R^2 values were between seventy to one hundred percent, it meant that the predictor variable strongly explained the occurrence of the incidences and types of crime. The coefficients of determination between forty to sixty-nine percent moderately accounted for the variations in crime while R^2 values from one to thirty-nine percent were weak in explaining the occurrence of crime. The unstandardized coefficients (B) provided insights into the direction of the relationships. A positive relationship is an indicator that crime increases as the predictor variable increases while a negative relationship suggests that crime decreases as the predictor variable increases.

RESULTS AND DISCUSSION

Social and Physical Characteristics of Residents and Residential Areas

The results of the descriptive analysis of the social characteristics of the residents of Makurdi town and the physical attributes of residential areas indicates that fourteen spatial units had a significantly high percentage ($\geq 50\%$) of older adults aged forty-five and above. Some of the spatial units include Old G.R.A, Judges' Quarters, Low Cost Housing Estate North Bank, Idye I and HUDCO Quarters North Bank. Between sixty to hundred percent of the residents in Angwan-Jukun, North Bank I, Wadata and Akpehe had relatively lower incomes while those in Judges' Quarters and HUDCO North

Bank had higher incomes. The percentage of residents engaged in the informal sector was significantly higher in Wadata, Ifan, North Bank I and Angwan-Jukun. A concentration of formal sectors employees was found in Low Cost Estate North Bank, HUDCO North Bank and Idye I. Low Cost Estate Naka road and Akpehe II had the highest percentage of residents born outside Makurdi (migrant populations). Residential areas such as Kanshio, Villa Suites, Mission Ward, Logo I, Akpehe I and Modern Market area had a high concentration of small dwellings which was used as a measure of building density. Some of the older residential areas were Federal Housing Estate, Ankpa Ward I, Lobi Quarters, Nyiman/Achusa and Benue Crescent Area. Judges' Quarters, Federal Housing Estate, New G.R.A and Lobi Quarters were residential areas with a high percentage of wall fences around homes while Wadata III, Benue Crescent Area and Terwase Agbadu II had a high percentage ($\geq 80\%$) of houses with front doors that were visible from houses across the street (inter-visibility). As mentioned in the methodology section, these characteristics were subjected to statistical analysis along with the data on incidences and types of crime to tease out the correlates. The distribution of crime in Makurdi town and the corresponding correlates are presented in the following subsections.

Criminal Victimization in Makurdi Town

The study found that an average of forty two percent of the residents in Makurdi town had experienced crime. Lobi Quarters, HUDCO North Bank, Judges' Quarters, New G.R.A I, Sule settlement and North Bank I were some of the residential areas where over sixty percent of the residents had reportedly been a victim of crime. The regression analysis combined both the social and physical characteristics to see how they reinforce one another to influence the distribution of crime within Makurdi town. In determining the correlates of the incidences of crime (victimization) in Makurdi town, the results of the stepwise regression (Table 1) showed that three characteristics namely age, building density and older residential areas satisfied the statistical criteria for inclusion in the regression model.

The results showed that the combined relationship between incidences of crime and older adults, size of dwelling and age of buildings was strong ($R = 0.568$). Thirty-two percent (R^2) of the variation in incidences of crime was explained by the combined forces of these three predictors. Sixty-eight percent (68%) of the variation in incidences of crime that was unaccounted for could be explained by other factors that were not captured in the current study. Since the order of entry into the equation can be used as a measure of relative importance, it means that comparatively, age (older adults: ≥ 45 years old) had a stronger influence (17.6%) over incidences of crime while older residential areas had the least level of influence (7%) in the hierarchy. These results further imply that age (older adults), building density (smaller dwellings) and older residential areas are the predictors of the level of victimization in the study area. However, judging by the values of the coefficient of determination (R^2), they can be described as weak determinants of criminal victimization in the study area.

From Table 1, it can be seen that all the significant F change values (also called p values) were below 0.05, indicating that age, building density and older residential areas have a statistically significant relationship with incidences of crime. These three predictors of the level of victimization had a positive relationship (B=0.605, 0.727 and 0.274) with incidences of crime. This implies that the level of victimization is likely to increase with increasing density, the concentration of older adults and in older residential areas. Mokhuwa (2014) also found an association between higher densities and crime in a study conducted in Tshwane Municipality, South Africa. On the contrary, Hillier and Sahbaz (2008) found what they termed an ‘unexpected’ situation where higher housing and population densities were associated with lower rates of residential burglary. Cahill (2004) observed that the relationship between crime and density is ambiguous. On one hand, more people can translate to more control while on the other, more people or buildings could mean more anonymity or refuge/concealment which creates ample opportunities for the convergence of attractive targets and motivated offenders.

Table 1: Stepwise Regression Model Summary (e) for Incidences of Crime in Makurdi

Dependent Variable	Predictor (s)	R	R Square	Sig. F Change	B
Incidences of Crime	Age	.420	.176	.001	.605
	Building Density				.727
	Older Residential Areas	.568	.323	.023	.274
Rape	Building Density	.305	.093	.021	.229
Armed Robbery	Houses with Fences	.450	.203	.001	.489
Burglary	Age	.399	.159	.002	.371
Theft	Income	.350	.123	.008	-.527
Assault	Houses with Inter-visibility	.551	.303	.028	-.294
	Household Heads in Formal Employment				-.583
	Migrant Population				.438

Source: Author’s Analysis (2015)

In considering age as a correlate of victimization, Nubani and Wineman (2005) found lower levels of crime in areas with a high concentration of youths in Ypsilanti, Michigan. In the current study, there were higher incidences of victimization in areas with a concentration of older adults aged forty-five and above. A probable explanation for the high levels of victimization in areas with a concentration of older adults could be that they are not active in public spaces like the younger adults and they are engaged in employment away from their homes. This situation is likely to increase the

vulnerability of public spaces within their residential environments and their homes. In Makurdi town, areas like Low Cost North Bank, Idye I and HUDCO North Bank had significantly high percentages of older adults, people employed in the formal sector and high incidences of victimization.

The relationship between older residential areas and incidences of victimization could be explained by the concept of “awareness spaces” introduced by Brantingham and Brantingham (1984). Awareness spaces simply refer to areas within the environment that potential offenders and victims are familiar with. These awareness spaces are found at the intersection of pathways individuals commute on to get to their activity areas or nodes. Higher incidences in the older residential areas could mean that offenders are more familiar with these areas having developed cognitive maps of the environment; thereby, finding it more convenient to select targets from such areas.

Correlates of Rape in Makurdi Town

Incidences of rape were higher in Angwan-Jukun, Kanshio and Owner Occupier Quarters II. The mean for incidences of rape in Makurdi town was four percent. This may be misconstrued as an indication that rape is not prevalent in the study area. However, it is pertinent to note that rape is one of the least reported crimes across the globe. In addition, the nature of sexual crimes such as rape is quite different from burglary or robbery and lower rates of occurrence should not be considered as insignificant. The stepwise regression analysis was applied to identify the components that best explain the distribution of incidences of rape in Makurdi town. Only small dwellings, symbolising building density entered the regression equation as a possible predictor of rape. The results of the analysis suggest that only nine percent of the variation in the incidences of rape is accounted for by small dwellings (building density). This implies that 90.7% of the incidences of rape are influenced by other factors. Though the model accounts for only a small percentage of the variation in the incidences of rape, the relationship between building density and rape in Makurdi was positive ($B=0.229$) and statistically significant ($p=0.021$) as presented in Table 1. This implies that in areas with high building densities, the incidences of rape are likely to increase. Thus, the analysis suggested that the physical component was the best and only predictor for rape in Makurdi town. In Canada, Hewitt et al (2018) found higher incidences of sexual crimes in areas with a number of characteristics including increase in population count. High building densities may help to provide the level of concealment that is needed to perpetuate sexual crimes.

Correlates of Armed Robbery in Makurdi Town

On average, thirty two percent of the residents of Makurdi town had experienced armed robbery. Ankpa Ward, Lobi Quarters, Villa Suites, HUDCO North Bank and Low Cost Naka road were some of the residential areas with a high percentage of armed robbery. The results of the regression analysis suggest that houses with fences explained twenty percent (R^2) of the variation in the incidences of armed robbery within residential areas in Makurdi (Table 1). This relationship is positive ($B=0.489$) and statistically

significant ($p=0.001$), meaning that where majority of the houses are fenced all round, the incidences of armed robbery may increase. Residential areas such as Judges' Quarters and Lobi Quarters had high percentages of fenced houses and incidences of armed robbery. While some of the incidences of armed robbery reportedly took place on the streets, other residents were robbed within their homes. Thus, while providing a cover for armed robbery to occur within homes, wall fences also shield residents from providing informal surveillance or watching the streets from their homes. This may likely increase the risks of victimization both within homes and on the streets. Quintal (2006) also reported high incidences of robbery in gated communities in Sydney, Australia. Though Newman (1996) advocated for territorial markers and target hardening measures such as fences and gates to reduce the ease of access to potential targets, it is evident that fences play a limited role in inhibiting armed robbery in the study area. This finding should however, not undermine the potential value of fences in curbing other types of crime.

Correlates of Burglary in Makurdi Town

Twenty seven percent (mean for Makurdi town) of the residents had been victims of burglary. High incidences of burglary were reported by the residents of Low Cost Estate North Bank, Welfare Quarters, Old G.R.A, Akpehe I and High Level I during the crime survey. In determining the correlates of burglary, only age (older adults: ≥ 45 years old) had a significant relationship with incidences of burglary. A close examination of the results indicates that the variable explained only sixteen percent of the variation in the occurrence of burglary in Makurdi town (Table 1). This means that eighty-four percent of the incidences of burglary occurring in Makurdi town are unaccounted for by this model. This further implies that there are other factors besides age that are responsible for the distribution of burglary in the study area but which are not captured in the current study. However, the relationship between older adults and burglary was statistically significant at 95% confidence level ($p < 0.05$), suggesting that it was not by chance. Thus, age had a predictive influence on the occurrence of burglary in Makurdi town. The relationship between older adults and burglary was positive ($B=0.371$); implying that incidences of burglary will tend to be higher in residential areas with a concentration of older adults. As discussed in the section on theoretical underpinnings, Cohen and Felson (1981) argued that opportunities for crime are created in the absence of capable guardians. Consequently, areas with lower levels of guardianship have a higher propensity to crime. This is more noticeable in areas with predominantly single land use types such as residential areas and in areas where majority of the residents work away from their homes. Low Cost Estate North Bank and Old G.R.A had a high concentration of older adults and significantly high incidences of burglary. Brantingham and Brantingham (1975) outlined some reasons why burglars prefer certain targets. These include apparent affluence, absence of security patrol or surveillance, ease of access and visible signs of isolation in neighbourhoods.

Correlates of Theft in Makurdi Town

In Makurdi town, an average of thirty two percent of the residents had been victims of theft. The highest incidences of theft were found in Akpehe II, Sule settlement, North Bank I, Wadata III, Low Level, Idye II and Owner Occupier Quarters I. For incidences of theft, only higher income entered the regression equation; accounting for twelve percent of the variance in incidences of thefts. Again, like the other crime types, there are other factors contributing to the occurrence of theft which will need to be explored in further studies. Because the p value (0.008) is less than 0.05, the relationship is adjudged to be statistically significant (Table 1) and not due to chance. However, the unstandardized coefficient ($B = -0.527$) suggests that it is an inverse relationship. This implies that within high income areas, incidences of theft are lower but with decreasing income levels, there is a probability that the incidences of theft will increase. In other words, lower income areas are more susceptible to higher levels of thefts than higher income areas. This finding aligns with the outcome of the study conducted in Kaduna, Nigeria by Umar (2017). The study also reported a link between lower socio-economic status and higher incidences of theft. In Makurdi, areas such as North Bank I, Akpehe II and Wadata III had a concentration of residents in the lower income category and high incidences of theft. In these residential areas, residents reported the loss of household items and other valuables which were left outside their homes during the day and at night.

Correlates of Assault in Makurdi Town

An average of fourteen percent of the residents of Makurdi town had experienced assault; particularly in Akpehe II, North Bank II and Modern Market area. Houses with open frontages allowing for front-door-to-front-door visibility, household heads in formal employment and household heads born outside Makurdi jointly accounted for 30.3% of the variance in the incidences of assault (Table 1). This suggests that they are weak predictors of assault. Houses with inter-visibility and percentage of household heads in formal sector employment displayed an inverse relationship ($B=-0.294$ and -0.583) with assault while percentage of household heads born outside Makurdi had a positive relationship ($B=0.438$) with incidences of assault. The inference drawn from this result is that with increasing levels of houses with inter-visibility/open frontages, incidences of assault are likely to decrease. This result further suggests that areas with fences and lower levels of front-door-to-front-door visibility may have a higher proclivity to assault. Majority of the assault incidences occurred on the streets. This means that houses with open frontages provide more opportunities for residents to watch the streets. Thus, residents' ability to provide informal surveillance within their residential environments could deter the occurrence of assault. This provides support for Jacobs' (1961) claim that 'eyes on the street' has the potential to deter the occurrence of crime on the streets.

The negative relationship between the percentage of household heads in formal employment and assault points to the probability of an increase in incidences of assault in areas with high percentages of informal sector household heads or unemployed household heads (both indicators of lower

socio-economic status in this study). Barslund et al (2005) and Mokhuwa (2014) found a link between income and assault; averring that incidences of assault are lower in middle to higher income areas. Low Cost Estate North Bank, New G.R.A and HUDCO Quarters North Bank had high percentages of household heads in formal employment and had no incidences of assault reported during the crime survey.

The individual relationship between the percentage of household heads born outside Makurdi (a measure for migrant populations) and the incidences of crime is positive. This suggests that with increases in the population of household heads born outside Makurdi, the incidences of assault will also increase. Therefore, residential areas within Makurdi town with high migrant populations have a higher risk of experiencing incidences of assault. Low Cost Estate Naka road and Akpehe II had the highest concentration of migrant populations and residents within these areas also experienced high incidences of assault. Shaw and McKay's social disorganization theory postulates that incidences of crime are higher in areas with ethnic/racial heterogeneity (a measure for migrant populations). They argue that the rate of residential mobility in such areas is usually high; thus, limiting the ability of residents to build strong social networks needed to curb crime. The relationship between the incidences of assault, houses with inter-visibility, household heads in formal sector employment and household heads born outside Makurdi is statistically significant ($p=0.028$), implying that they are better predictors of assault in the study area as compared to the other characteristics.

CONCLUSION

This study has demonstrated that both social and physical components influence the levels of criminal victimization and the occurrence of different types of crime within Makurdi town. A summary of the predictors of crime is presented in Table 2. These results therefore, reiterate the assertion by Hillier (2004) that different crime types have different social and physical 'logic' or correlates. As highlighted in the results section, there were some similarities between findings reported in previous studies in different cities and the study in Makurdi. However, most of the correlates of crime in Makurdi had a weak influence on the occurrence of crime. This suggests that the identified predictors work in combination with other factors not covered in this study to create opportunities within the built environment. Such opportunities, where they exist, facilitate the convergence of motivated offenders and attractive targets resulting in the occurrence of crime. This exploratory study is an attempt to contribute to the study of crime with perspectives from a middle sized city in the global south. The study was also predicated on the argument that place-based crime research initiatives are site, time and context-specific. Thus, superimposing predetermined solutions in cities without an adequate understanding of the local conditions is not only inappropriate but also misleading.

Table 2: Summary of the Correlates of Crime in Makurdi Town

Crime	Predictors	Attribute	Effect
Victimization			Positive
Rape	Building Density	Physical	Positive
Victimized			Positive
Burglary	Older Residential Areas	Physical	
	Age (Older Adults)	Social	Positive
Victimization			Positive
Armed Robbery	Fences	Physical	Positive
Assault	Employment Status (Formal Employment)	Social	Negative
	Houses with open frontages (Visibility)	Physical	Negative
	Migrant Household Heads	Social	Positive
Theft	High Income	Social	Negative

Source: Author's Analysis (2015)

Research findings are supposed to influence policy decisions and planning practice. It is therefore expected that the results presented in this study will provide insights that would be useful in designing appropriate interventions for crime prevention and control in the study area. Predictors such as building density, fences and houses with open frontages speak to the need for improved visibility in residential areas. Improved visibility could facilitate informal surveillance by residents as they go about their duties within the environment. Some of the ways through which visibility and by extension surveillance can be improved include lighting, the use of closed circuit television cameras and the use of short wall fences, railings or shrubbery. The predictors identified in this study could also act as pointers to Law Enforcement Agencies about the types of residential areas that may be at higher risks for different types of crimes. Other interventions that may be adopted include strengthening neighbourhood watch groups within high density areas, areas with a high percentage of residents with lower socio-economic status and migrant populations and in older residential areas. This will further increase the presence of capable guardians as advocated by Cohen and Felson's routine activities theory.

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