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Correlates of Residents' Response to Crime in Nigerian Cities

Adigun, Folasade Oyenike [α] & Prof Adedibu A. Afolabi [σ]

Abstract - The paper examines the socio economic attributes of residents (SEC); building and environmental features (BEF), residential crime magnitude, fear of crime events, fear of neighbourhood and households' safety measures in Ibadan, Zaria and Owerri with a view to establish a relationship between them. Four indices were developed. These are 'Residential Crime Magnitude' (RCM), 'Fear of Crime Events Index' (FCEI), 'Fear of Neighbourhood' (FNI) and 'Household Safety Measures Index' (HSMI). The study observed a significant relationship between low attributes of BEF, low attributes of SEC, low attributes of RCM and low attributes of HSMI, low attributes of FNI and low attributes of FCEI. Among SEC, BEF and RCM, BEF was identified as the strongest dependent variable informing residents' response to crime. Thus any meaningful intervention at crime control must first begin with decision on building and environmental features that discourages crime incidence and reduces fear of crime.

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I. Introduction

Human beings are created to respond to stimuli. The response could be internal or external. In the same vein residents respond to crime emotionally and physically. In this study fear is considered as the emotional response to crime while the use of household safety measures is taken as the physical response. Fear is the foremost response to experience or knowledge of crime incidence (Afon 2001), which under normal condition dictates the type as well as extent of household safety measures to be employed. It could also influence the preparation and the ardence of criminals thereafter. On the other hand the availability of targets in absence of capable guardian is a motivating factor for incidence of crime. Thus, crime incidence, fear of crime and physical response to crime together with other factors such as socio-economic and environmental features could constitute a cycle. Residents may build confidence on the strength of safety measures taken at household and neighbourhood levels; thus affecting their level of fear.

Four notable categories of response to crime were identified in the literature: control through the convectional justice system (Walklate, 1996; Shaftoe, 2002), social crime prevention (Aguda, 1994; Shaftoe, 2002), African Traditional Protective Devices, ATPDs (Agbola, 1997) and Crime Prevention through Environmental Design (CPTED). Criminal Justice System is the most commonly used crime control measures. Yongcho (1974) described this approach as one, which involves the entire array of government institution that functions as the instrument of a society in enforcing the standard of conduct needed for the protection, safety and freedom of individual citizens, and for the maintenance of order. The task involves detecting, apprehending, prosecuting, treating and sanctioning the deviants. This method has been referred to as offender-centered strategy (Walklate, 1996).

The second measure is the social crime prevention which in the words of Shaftoe (2002) consist of "an interlocking series of interventions that enable people to lead a life where they do not have the inclination, motivation or need to offend against others, whether for expressive or acquisitive reasons". The next strategy is Crime Prevention through Environmental Design (CPTED) which is an environment-centered strategy. It includes the specific targeting associated with situational crime prevention and the more general approach of designing out crime. The pioneers of this approach are Jacobs (1995) and Jeffery (1977) but its famous exponent is Newman (1995) though Coleman (1985) also worked extensively on it.

The manifestation of some these strategies in Nigeria are at different levels. Communities and individuals react to crime in Nigeria mostly from the ineffectiveness (or otherwise) of the criminal justice system in combating crime and insecurity in their areas (Agbola, 2002). Several studies have shown that residents' responses to crime in Nigeria are of various forms including crime reporting to police (though decreasing in use), individual preventive measure and collective activities against criminal occurrences (Agbola 1997; Afon, 2001, Agbola 2002; Abodunrin 2004; Oredein, 2006). Included among individuals' attempt at controlling crime are: construction of high walls around residences; construction of high fencing walls, massive gates and strong locks; use of Close Circuit Television CCTV; installation of lighting facilities at every corner of the residential environment; use of African power called "juju" or charm and total reliance on God Almighty for protection. Others include the use of dogs, guns, insurance schemes, special security door, burglar alarms, police patrol, window and door grills. On the community or collective level, night watchmen are

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employed to keep watch on neighbourhoods, gates are installed on streets, bumps or speed breakers are put on streets. Others include the use of warning signs to restrict movement and the use of community security check points. Vigilante groups (a variant of night watchmen) are used in some communities. These responses however vary among the three residential areas based on the diversity in social and economic characteristics of the residents as well as level of crime incidences. It has been argued that there are intricate connections and complex interrelationships between the environment in which urban dwellers live, incidence of crime and, by logical extension, their response to crime (Abodunrin 2004; Adeboyejo and Abodunrin 2005). Crimes occur not only within but are also influenced and may indeed be compounded by a wide ranging socio-economic and environmental context, summarized in urban residential patterns of various cultural settings.

Therefore any study aiming at providing sufficient information to enable a solid conclusion useful for decision making must take cognisance of the complexities between residents' socio-economic attributes, building and environmental features typical of each residential area, crime incidence and residents' responses. Isolating a single variable for any substantive explanation may be a minor task out of the whole gamut because of the complexity of the relationship between these variables. Against this background this study examines the socio economic attributes of residents; building and environmental features, residential crime magnitude, fear of crime events, fear of neighbourhood and households' safety measures in Ibadan, Zaria and Owerri with a view to establish the relationship between them. This is done with the aid of canonical correlation statistic- a statistical tool which allows multiple dependent and independent variables in a single analysis. The three selected cities are traditional urban centres with phenomena growth in population and area extent, increasing level of urbanization and industrialization, as well as political and socio-economic prestige in the area. Zaria, Ibadan and Owerri (see Fig 1) are respectively one of the major Hausa-Fulani, Yoruba and Igbo cities and as such, they are capable of reflecting the socio-economic and cultural attributes of the three regions selected.

II. Research Methodology

The study utilized primary data obtained through questionnaire administered to residents. Information obtained includes residents' socioeconomic characteristics (SEC); building and environmental features (BEF); residential area crime experienced within six months (RCM); level of fear of crime events; level of fear of neighbourhood and level of usage of household safety measures (or residents' physical response to crime). Five, two and three local government areas in Ibadan, Zaria and Owerri respectively formed the sampling frame (see appendix 1). Localities within the three distinct residential areas were identified. All the low density residential areas surveyed in Owerri were selected from Owerri Municipal because areas that could be identified as low density areas fall under the jurisdiction of Owerri Municipal Local Government area.

Previous research efforts identified three major categories of residential areas which are distinct in social as well as physical attributes (Onokerhoraye & Omuta, 1986; Afon 2004). These are: low quality residential area usually (high density residential zone); medium quality residential area (medium density residential zone) and high quality residential area (low density residential zone). In modern urban centres residential density is described in terms of floor area ratio and population. In traditional urban centre traditional/core, transitional and suburban residential areas represent the three residential areas highlighted above (Onibokun 1972). According to Okewole (1977) historically, the traditional core area is a pre-colonial development occupied by indigenous population and or the early settlers. This area is often found in the heart of the city (Onerkerhoraye & Omuta, 1985). The transitional residential area developed during the colonial era forms the next layer of development. The sub- urban/low density residential area could be pre and post independence developments. In cities of this nature socio-economic characteristics (such as level of education, occupation and income) and environmental quality are considered to vary inversely with density. These features were used in identifying the three residential areas.

The study employed a multi stage sampling technique. The random and systematic sampling techniques were used within the context of already stratified local government areas and the three residential zones. The first level of stratification was done on the basis of the delineated local government areas. The second level of stratification was based on identified residential areas. Localities with the features of the three residential areas were identified in each local government area and purposively selected for the study.

The first building in each randomly selected street was chosen at the discretion of the researcher. Subsequent selection was done at an interval of ten buildings. To cater for residents in landlocked portions of the core area where buildings are not accessible by roads, buildings were selected at uniform interval of every five building off the roads. The target population are the residents. A household was selected from each chosen building from where a resident not less than 18 years either male or female was sampled. The selected residents were investigated using a structured questionnaire. The structured questionnaire was distributed using a ratio of 3:2:1 in the high, medium

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and low density residential zones in each selected city (see table 1). This is in line with the generally believed pattern of population distribution among residential areas (Adeboyejo and Onyeonoru, 2003). A total of 1164 copies of the questionnaire out of the 1220 scheduled for distribution were considered useful for the analysis. This represent 95.4 percent questionnaire recovery rate

Table 1 : Summary of Questionnaire Distribution

Cities	Residential Areas for analysis			Total	Retrieved
	Low	Medium	High		
Ibadan	111	224	336	669	654
Zaria	58	116	174	348	319
Owerri	33	67	101	201	191
Total	202	407	611	122 0	1164

Source : Author's 2010.

Data analysis was both descriptive and inferential. Four indices were developed in this study. These are 'Residential Crime Magnitude' (RCM), 'Fear of Crime Events Index' (FCEI), 'Fear of Neighbourhood' (FNI) and 'Household Safety Measures Index' (HSMI). The first is the aggregate of crime experienced by households while the second was used in measuring what residents fear most in criminal attack and public disorder. The third: FNI was used in measuring fear of likelihood of crime incidences at certain period of time within the residential neighbourhood. The fourth index was developed to assess residents' level of usage of household safety measures HSMI (or residents' physical response to crime). Variables indicating FCEI and FNI were measured in the ranking scale of Likert as "very high" (5), "high"(4), "moderate (3)", "low"(2) and "very low"(1). The FCEI and FNI were obtained by dividing the summation of weighted value (SWV) by the total number of responses. The SWV of each variable is the addition of the product of the proportion of responses to it and the weighted value attached to each rating. This is done for each residential area. The mathematically expression is as follows:

FCEI = SWV/Ni.....1
FNI=SWV/Ni.....2
SWV=NiVi.....3
Where: FCEI = 'Fear of Crime Events Index'
FNI = 'Fear of Neighbourhood Index'
SWV = Summation of weight value
Ni = Number of Respondents rating variable i; and
Vi = weight assigned to variable i

Some variables indicating HSMI were obtained in ranking scale of Likert as "very often", "quite often", "often", "seldom" and "not at all". These include use of special door locks, alarm system, burglar proofs on doors and windows, use of security dogs, sword/axe/club/stick, juju, gun and security guard(s). HSMI was obtained by dividing the summation of weighted value (SWV) by the total number of responses. The SWV of each variable is the addition of the product of the proportion of responses to it and the weighted value attached to each rating. This is done for each residential area. The mathematically expression is as follows:

HSMI = SWV/Ni.....4
SWV=NiVi
Where: HSMI = 'Household Safety Measure Index'
SWV = Summation of weight value
Ni = Number of Respondents rating variable i; and
Vi = weight assigned to variable i

Other safety measures assessed as nominal data include material used for door, window, fence and tip of fence; and body responsible for neighbourhood security surveillance.

The variables in each of the groups highlighted above were summarized using factor analysis and their linear composites were extracted. Nineteen factors emerged from the analysis out of which six were selected and others regarded as residual because of their loading values and the fact that they are repetition of the selected ones (see appendix 2). The loadings of the variables under each group are listed in the descending order of loadings attached to them.

There after the relationship between all the groups was verified using canonical correlation analysis.

1. Residential Crime Incidence (RCM): This factor extracts 73.529% of the total variance of the data set. The crime categories (with their loadings) included here are: assaults .978; white collar .978; stealth/pretence .973; against morality .961; against property .944; against public law .929; aggression .927; public disorderliness .652; acquisition .629; unnatural crime .367.
2. Fear of Crime events Index (FCEI): This component accounts for 62.457% of the total variance. The variables measuring fear of crime events loaded thus: female member of household raped .926; female household member tortured or beaten .909; destruction of car .894; self tortured or beaten .872; kidnapping .871; self raped .862; burning of cars .839; loss of one's life .833; burning of houses and properties .799; contacting HIV AID or venereal disease .754; killing of household member .698; money stolen .653; destruction of window/door locks/ burglary proof .647; shock or psycho imbalance .616; property carted away .554.
3. Fear of Neighbourhood Index (FNI): This component extracts 51.889% of the total variance of the data set. The loadings of the variables used to measure feelings of fear in the residential neighbourhood are as follows: worried going out in the dark .935; risk for women going alone in the dark .930; raping of women/girls in the dark .814;

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one who goes out before dawn likely to be attacked .803; risk of attack when out in the area in dark .779; afraid being alone anytime at home .721; afraid being alone in the night .717; afraid being alone in the morning .493; afraid being alone in the afternoon .423; afraid being alone in the evenings .279.

4. Building and Environmental Features (BEF): This factor extracts 43.377% of the total variance of the data set. The variables concerned and their loadings is as follows: percentage residential use .835; percentage street lights .829; percentage flats .657; percentage duplex/bungalow .619; percentage access road .541; percentage security checking points .330; percentage first-floor .079; percentage restriction signs -.103; percentage ground-floor -.110; percentage street-bumps -.703; percentage residential/commercial uses -.889; percentage accessed by footpath -.902; percentage traditional/roomy building -.954.
5. Household Safety Measures Index (HSMI): This factor extracts 42.741% of the total variance of the data set. The loading of the variables under this component is thus: percentage barb wire 0.082; percentage burglar proof on doors 0.080; alarm system 0.079; iron/steel window 0.076; percentage iron/steel door 0.071; security dogs 0.063; security guard 0.061; barbwire fence 0.056; percentage burglar present 0.055; door locks 0.052; vigilante responsible for neighbourhood 0.051; percentage hedges as fence 0.048; percentage police responsible for neighbourhood security 0.033; sword/axe/club/stick 0.032; percentage glass panes/flush doors 0.022; burglar proof on windows 0.022; percentage concrete fence 0.020; percentage broken bottles on fence -0.084; percentage wooden window -0.78; percentage wooden doors -0.075; percentage hired security guard responsible for neighbourhood security -0.074; gun -0.064; percentage no fence -0.061; juju -0.052; percentage no burglar -0.012; percentage louver blades glass -0.007.
6. Socio-economic Characteristics (SEC): This component extracts 37.550% of the total variance of the data set. The loading of the variables under it is as follows: percentage monthly income between #25,000:00 – #70,000:00 .929; percentage 1 – 4 persons .916; percentage monthly income greater than #70,000:00 .856; percentage public service .837; percentage having 1 – 2 vehicles .829; percentage married .655; percentage 31 – 55 years old 638; percentage having more than 2 vehicles .628; percentage of non-indigene .621; percentage male .606; percentage post-graduate .601; percentage greater than 10 years .229; percentage more than 55 years .197; percentage tenant .136; percentage NCE/OND holder .114; percentage organized private sector .101; percentage landlord -.097; percentage less than 10 years -.230; percentage unemployed -.461; percentage with no formal education -.473; percentage single -.491; percentage 18 – 30 years -.598; percentage female -.606; percentage indigene -.616; percentage less than #6,000:00 -.763; percentage no vehicle -.794; percentage greater than 10 persons/building -.882;.

Using Statistical Package for Social Scientist the study employs canonical correlation analysis to explain the relationship between the linear composites of socio-economic characteristics (SEC), building and environmental features (BEF), residential crime magnitude (RCM), indices of fear of crime events (FCEI), fear of neighbourhood (FNI) and households' safety measures (HSMI).

The linearity of the relationship between .....

The general canonical model is given as:

$R = R\text{-}1_{yy} R_{yx} R\text{-}1_{xx} R_{xy}$.....5

where:

R = Canonical correlation

$R\text{-}1_{yy}$ = Inverse of correlation among composites of fear of crime events (FCEI), fear of neighbourhood (FNI) and households' safety measures (HSMI) (Dependent Variables DVs)

R_{yx} R_{xy} = Correlation among independent and dependent variables

$R\text{-}1_{xx}$ = Inverse of correlation among composites of residential crime incidence (RCM), residents' socio economic characteristics (SEC) and building and environmental features (BEF) (Independent Variables IVs)

III. Result and Discussion

The result of the correlation analysis is documented appendix 3. The correlation of set 1 (Ryy) comprises the correlations between variables of fear of criminals events (FCEI), fear of Neighbourhood (FNI) and households' safety measures (HSMI). These variables have positive correlation coefficients. This indicates that the correlation is uni-directional. The higher the attributes of the composites the higher the scores they obtain. In this context the higher the positive value of variables of fear of crime events index (FCEI), fear of neighbourhood index (FNI) and households' safety measures index (HSMI), the higher their attributes in the model. Considering the loadings in set 1, the absolute values of fear of neighbourhood FNI (.5804, .5737) is greater than fear of crime events FCEI (.5804, .3330). The index with the least absolute values is household safety measures HSMI (.3330, .5737). In order of importance the implication of this is that fear of neighbourhood is more crucial in the canonical correlation analysis performed than fear of crime events and household safety measures. The relationship between incidence of crime, socio-economic

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characteristics and, building and environmental features on one side, and residents' response to crime (fear of neighbourhood, fear of crime events and households' safety measures) on the other side places fear of neighbourhood as the prime response to residential area crime incidence. In other words, residents' response to crime is first and majorly emotional in respect of fear of the likelihood of crime occurring at certain period of time within the residential neighbourhood (measured as FNI). The fear of crime events i. e. fear of what one could suffer during crime incidences is the second foremost emotional response to crime. Finally these emotional responses manifested in physical household safety measures employed.

The correlation for set 2 comprises of the correlation between the factors of residential area crime incidence (RCM), building and environmental features (BEF) and residents' socio-economic characteristics (SEC). The correlation coefficients of these are both positive and negative that is bidirectional. This implies that the higher the attributes of the factors the higher the scores they obtain. In this regard the higher the positive value of the composites of fear of crime events (FCEI), fear of neighbourhood (FNI) and households' safety measures (HSMI), the higher their attributes in the model. Among the loadings of factors in set 2, the absolute value of building and environmental features BEF (-.6842, .5500) is greater than that of residential crime magnitude RCM (-.3593, -.6842) while the least is socio-economic characteristics SEC (-.3593, .5500). This implies that residents' response to crime is first influenced by building and environmental features then residential crime magnitude and socio-economic characteristics.

The analysis produced three canonical variates. The correlation of the first pair of canonical variate (Root 1) is .995 (see Fig 2). The eigen value for the correlation is therefore .990. Eigen value is the square of correlation r2=ƛ1. The first pair of canonical variate have .995 correlation and overlap with .990 or 99.0% variance. The correlation of the second pair of canonical variate (Root 2) is .695 (see Fig 3). Similar to the procedure used for Root 1, the eigen value for Root 2 is .482. This connotes that the second pair of canonical variate have .695 correlation and overlaps with .482 or 48.2% variance.

Table 2 : Bartlet's Test of Significance

Root	X2	P value	R
Root 1	70.455	0.000	.995
Root 2	9.346	0.053	.695
Root 3	0.448	0.503	.181

Source : Author's, 2010

In order to know whether the remaining correlations are truly zero the Bartlet's test of significance was computed and documented in table 2. For Root 1, X2 is 70.455 with P value of 0.000 at 99.99 % confidence limit. There is a significant overlap in the variability between variables concerned. This indicates that there is a significant relationship between variables of residential crime magnitude RCM, socio-economic characteristics SEC and building and environmental features BEF; and fear of crime events FCEI, fear of neighbourhood FNI and households' safety measures HSMI. The X2 for Root 2 is 9.346 with P value of 0.053 at 99.99 % confidence limit. The P value for Root 2 is significantly different from zero. This implies that there is significant overlap in the variability between the second pair of the canonical variates (Root 2). The X2 for Root 3 is 0.448 with P value of 0.503 at 99.99% confidence limit. This indicates that there is no significant overlap in the variability of the variables concerned. In canonical analysis the first pair of canonical variate is the first canonical extract and the strongest to be considered in the interpretation of the model (Tabachnick and Fidell, 2001) moreover the third pair of canonical variate had no significant overlap in the variability between the variables concerned. Thus the first and second will be interpreted in this study.

Table 3 : Loading Matrix for Canonical Correlation

Sets	Variable set	Canonical Variate Pairs		
		First	Second	Third
Set 1	FCEI	-.225	-.021	.974
	FNI	-.722	-.552	.417
	HSMI	-.946	.296	.130
Set 2	RCM	-.046	-.984	.174
	SEC	-.386	.518	.763
	BEF	-.697	.708	-.112

Source : Author's, 2010

Documented in table 3 is the loading matrix of canonical correlation. For the first pair of canonical variate, fear of crime events (FCEI) correlates -.225; fear of neighbourhood (FNI) correlates -.722; households' safety measures (HSMI) correlates -.946 while residential crime magnitude (RCM) correlates -.046; socio-economic characteristics (SEC) correlates -.386; building and environmental features (BEF) -.697. The correlation of the first pair of canonical variate is unidirectional because the coefficients carry negative signs. This indicates that a low attributes of household safety measures (HSMI), a low attributes of fear of neighbourhood (FNI) and low attributes of fear of crime events (FCEI) is associated with a low attributes of building and environmental features (BEF), low attributes of socio-economic variables (SEC) and a very low attributes of residential crime magnitude (RCM). In other words variable of building and environmental features is stronger among the independent variable sets followed by socio-economic variables then residential crime magnitude. In this order they influence first level of installation and usage of household safety

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measures, residents' level of fear or dread of likelihood of crime incidence in their neighbourhood and lastly fear of events associated with magnitude of crime within residential areas.

With the second pair of canonical variate fear of crime events (FCEI) correlates -.021; fear of neighbourhood (FNI) correlates -.552; households' safety measures (HSMI) correlates -.296 while residential crime magnitude (RCM) correlates -.984; socio-economic characteristics (SEC) correlates .518; building and environmental features (BEF) .708. The correlation of the second pair of canonical variate is bidirectional because the coefficients carry either positive or negative signs. This indicates that a low attributes of fear of neighbourhood (FNI), high attributes of household safety measures (HSMI), and a very low or insignificant attributes of fear of crime events (FCEI) is associated with a very low attributes of residential crime magnitude (RCM), high attributes of building and environmental features (BEF) and, a high attributes of socio-economic characteristics (SEC). Variables of building and environmental features are stronger among the independent variable sets followed by variables of socio-economic variables then residential crime magnitude. In this order they influence first households' safety measures then fear of crime events and lastly fear of neighbourhood. This implies that households in the high socio-economic class with high building and environmental features employed a high usage of households' safety measures, inhibiting crime incidence (low residential crime magnitude) thus resulting in low fear of crime events and fear of likelihood of occurrence of crime in the neighbourhood. This implies that residents with high socioeconomic profile with high building and environmental features could afford the installation of more household safety measures. This acts as deterrence to crime thus inputting confidence in households evidenced in low fear of neighbourhood and crime events.

The implication of the results of the first variate pair is that households with low building and environmental features, low socio-economic attributes, had low experience of crime as a result of high usage of household safety measures dictating a low usage of household safety measures then low level of fear of likelihood of crime incidences in the neighbourhood and low fear of what to suffer if crime occurs. Further implication is that residents with low feelings of fear of crime in their neighbourhood had lower fear of crime events because they experience low crime incidences and are in the low socio-economic rung with low building and environmental features thus utilizes household safety measures minimally. Practically, when building and environmental features are poor and the residents are poor while crime magnitude in the area is relatively low, it follows that: household safety measures would be close to nil, fear of neighbourhood will be very low and the fear of crime events will be very low too.

It is important to interpret this correlation with the communalities which loads highly in each of these composite. A residential environment with low proportion of buildings used solely for residential purpose and low street lights with low proportion of residents with monthly income of #25,000: 00 - #70,000: 00; 1-4 persons per building, monthly income greater than #70,000:00, public service and vehicle ownership of 1-2 vehicles had low experience of crime of assaults, white collar crime and stealth/pretence. This scenario necessitated low use of barb wire on the fence, burglar proof on doors, alarm system etc. Then there is low worry of going out in the dark, risk of women going out in the dark and fear of women getting raped in the dark. Principal example of this scenario is the situation of the high density residential areas sampled in this study.

Since the strongest of the independent composite in this relationship is building and environmental features, thus policies or programmes targeted at addressing criminality in areas of low socio-economic attributes with low residential crime incidences must pay careful attention to variables of building and environmental features. Such variables include use of buildings, use of street light in neighbourhoods, building type, access type, use of restriction signs within neighbourhood etc. Summarily a significant relationship has been established between socio economic attributes of residents; building and environmental features, residential crime magnitude, fear of crime events, fear of neighbourhood and households' safety measures. Thus, the third hypothesis set initially in this study is rejected.

a) Redundancy Analysis

The redundancy analysis reveals how much variance is extracted by each canonical variate from its own side and the other side of the equation.

Table 4 : Proportion of Variance Extracted

Canonic Variate Pairs	Proportion of Variate extracted from Independent side (%)		Proportion of Variate extracted from dependent side (%)	
Dependent Side	1 (48.9)	.484	(48.4)	.489
	2 (13.1)	.063	(6.3)	.131
	3 (38.0)	.012	(1.2)	.380
Independent side	1 (21.0)	.212	(21.2)	.210
	2 (28.0)	.579	(57.9)	.280
	3 (0.7)	.209	(20.9)	.007

Source : Author's, 2010

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The three canonical variates pairs were considered here in order to ascertain the extent of the variance extracted from both the dependent and independent sides of the equation. This is done in order to account for total (100%) variance. The proportion of variance extracted by variables used is documented in table 4. The first, second and third canonical variates pair from the dependent composites extracted 48.4%, 6.3% and 1.2% respectively of the independent composites. Thus the dependent composites extracted a total of 55.9% variance of the independent composites. Likewise from its own side i.e dependent composites the first, second and third canonical variates pairs extracted 48.9%, 13.1% and 38% variance respectively. This produced a total of 100% variance. From the independent composites, first, second and third canonical variates pairs extracted 21.2%, 57.9% and 20.9% (totalling 100%) of the variance in favour of the independent side. On the other hand the first, second and third canonical variates pair extracted 21.0%, 28.0% and 0.7% respectively from the dependent composites. The independent composite thus extracted 49.7% variance from the dependent composites. This implies that 49.7 percent of the variation observed in residents response to crime i.e. fear of crime events, fear of neighbourhood and households' safety measures is extracted by variables of residential crime magnitude, building and environmental features and socio-economic characteristics.

IV. Conclusion

The study employed the use of a robust statistical technique: canonical correlation analysis in determining the relationship between attributes of building and environmental features (BEF), socio-economic characteristics (SEC), residential crime magnitude (RCM) and household safety measures (HSMI), fear of neighbourhood (FNI) and fear of crime events (FCEI). The relationship between incidence of crime, socio-economic characteristics and, building and environmental features on one side, and residents' response to crime (fear of neighbourhood, fear of crime events and households' safety measures) on the other side places fear of neighbourhood as the prime response to residential area crime incidence. In other words, residents' response to crime is first and majorly emotional in respect of fear of the likelihood of crime occurring at certain period of time within the residential neighbourhood (measured as FNI). The fear of crime events i. e. fear of what one could suffer during crime incidences is the second foremost emotional response to crime. Finally these emotional responses manifested in physical household safety measures employed.

This study therefore posits that there is significant relationship between low attributes of BEF, low attributes of SEC, low attributes of RCM and low attributes of HSMI, low attributes of FNI and low attributes of FCEI. The confirmation of a significant relationship between these six indices is an indication that crime control cannot be properly handled until all these aspects are taken care of. However BEF was identified as the strongest dependent variable informing residents' response to crime thus any meaningful intervention at crime control must first begin with decision on building and environmental features that discourages crime incidence and reduces fear of crime. This is not to undermine other factors which show a relationship with response to crime. According to the result of this analysis when this is taken care of the feedback will be observed first on residents' perception of their vulnerability within their neighbourhood (FNI).

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Appendice

Appendix 1 : Selected Localities in Ibadan, Zaria and Owerri

S/N	Local Government Area	No of Questionnaire Scheduled	Residential Zones	Localities
1	Ibadan North	77	High	Yemetu, Oke Aremo, Oje, Itu Taba
		52	Medium	Mokola and Total Garden,
		25	Low	New Bodija
2	Ibadan North east	71	High	Ode Aje, Beyerunka and Ita Bale Labo
		47	Medium	Iwo Road and Orita Basorun
		24	Low	Agodi
3	Ibadan South east	83	High	Elekuro, Odinjo and Idi Arere
		55	Medium	Orita-Challenge and part of Yejide
		27	Low	Part of Felele
4	Ibadan South west	67	High	Foko, Gege, Bode and Popoyemoja
		44	Medium	Odo-Ona and Oke-Bola.
		22	Low	Oluyole Estate
5	Ibadan North west	38	High	Agbeni/Agbaje, Idikan and Abebi
		26	Medium	Eleyele

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		13	Low	Onireke GRA
	Total	671		
6	Zaria	72	High	Zaria City,
		48	Medium	Wusasa and Gaskia.
		24	Low	GRA
7	Sabon Gari	102	High	Sabon Gari and Samaru,
		68	Medium	Railway Authority Staff Quarters and Centre for Energy Development Staff Quarters,
		34	Low	School of Aviation Senior Staff Quarter, Ahmadu Bello University Staff Quarter and Nigeria Institute of Transport Technology
	Total	348		
8	Owerri Municipal	32	High	Douglas
		21	Medium	Ikenegbu and Works layout.
		11	Low	Prefab/Aladima and World Bank Estate
9	Owerri North	44	High	Orji and Amakoya
		30	Medium	Emekuku
		14	Low	
10	Owerri West	25	High	Nekede
		16	Medium	Ihagwa
		8	Low	
	Total	201		

Source : Author's, 2010.

Appendix 2 : Factor Analysis

Component Matrix[a]

	Component	
	1	2
RCM_acquisition	.629	.680
RCM_stealth/pretence	.973	-.064
RCM_aggression	.927	-.333
RCM_assaults	.978	-.058
RCM_against morality	.961	-.108
RCM_against property	.944	.001
RCM_public disorder	.652	.623
RCM_white collar	.978	.094
RCM_against public law	.929	-.162
RCM_unnatural crime	.367	-.665

Extraction Method : Principal Component Analysis.

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a. 2 components extracted.

Component Matrix[a]

	Component		
	1	2	3
FCEI_loss of one's life	.833	.368	.063
FCEI_killing of hsd memb	.698	.516	-.484
FCEI_female memb of hsd raped	.926	-.124	-.222
FCEI_self raped	.862	-.015	-.459
FCEI_kidnappg	.871	-.324	.082
FCEI_self tortured or beaten	.872	.145	.204
FCEI_female hsd memb tortured or beaten	.909	-.027	.132
FCEI_contactg HIV AD or venerable disease	.754	-.443	.152
FCEI_shock or pscyco imbalance	.616	.668	-.197
FCEI_ppty carted away	.554	.363	.683
FCEI_money stolen	.653	.022	.687
FCEI_destr of windoor locksburglar proof	.647	.519	-.044
FCEI_destr of car	.894	-.355	.153
FCEI_burng of houses & ppties	.799	-.403	-.392
FCEI_burng of cars	.839	-.416	-.117

Component Matrix[a]

	Component	
	1	2
RCM_acquisition	.629	.680
RCM_stealth/pretence	.973	-.064
RCM_aggression	.927	-.333
RCM_assaults	.978	-.058
RCM_against morality	.961	-.108
RCM_against property	.944	.001
RCM_public disorder	.652	.623
RCM_white collar	.978	.094
RCM_against public law	.929	-.162
RCM_unnatural crime	.367	-.665

Extraction Method : Principal Component Analysis.

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Component Matrix [a]

	Component				
	1	2	3	4	5
RR_sp door locks	.573	-.156	.400	-.188	.655
RR_burglar windows	.249	-.916	.150	-.138	.192
RR_burglar on doors	.884	-.354	-.187	.103	-.142
RR_securitydogs	.699	.558	.180	.106	.120
RR_gun	-.711	.314	.331	.453	.090
RR_swordaxeclubstick	.355	.803	-.218	.086	.187
RR_alarm syst	.874	.170	-.262	-.147	.148
RR_securityguard	.681	-.105	.601	.173	.162
RR_juju	-.580	.322	.583	-.233	.183
PER_WOODENDOORS	-.838	-.388	-.291	-.086	.236
PER_IRONSTELLDOOR	.786	.384	-.382	.145	-.109
PER_ GLASSPANESFLUSHDOORS	.249	-.061	-.508	.578	.024
PER_WOODENWINDOW	-.864	.188	-.385	-.093	-.094
PER_ IRONSTEELWINDOW	.843	.228	-.422	.067	-.013
PER_ LOUVREBLADESGLASSPANES	-.081	-.813	.127	.190	.157
PER_NOFENCE	-.679	.586	.051	-.413	-.107
PER_CONCRETEFENCE	.219	-.870	-.232	.335	.117
PER_BARBWIRE_FENCE	.622	.617	.258	-.086	.255
PER_HEDGESFENCE	.535	.157	.526	-.006	-.439
PER_ BROKENBOTTLES_ ONFENCE	-.936	-.097	.030	.254	.187
PER_SPIRALBARWIRE	.912	.149	.115	-.271	-.241
PER_BURGLAR_ PRESENT	.610	-.589	.424	.154	-.158
PER_NO_BURGLA	-.132	.715	-.574	.143	.302
PER_VIGILANTEE_ RESPON	.567	-.631	-.460	-.238	.019
PER_ HIREDSECURITYGUARD _RESPON	-.821	-.096	.219	.359	-.239
PER_POLICE_RESPON	.371	.564	.358	.632	.015

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Component Matrix [a]

	Component					
	1	2	3	4	5	6
PER_N_FEDU	-.473	.682	-.455	.176	-.261	.062
PER_NCE_OND	.114	.277	.716	-.079	-.036	.525
PER_PGRAD	.601	-.203	.156	.644	.194	-.162
PER_ORG_PRVSECT	.101	.171	.120	-.326	.792	.274
PER_PUBL	.837	-.336	-.225	-.119	-.259	-.209
PER_UNEMPL	-.461	.309	-.106	.685	.248	-.360
PER_GRT#70000	.856	-.220	-.290	.092	-.012	.160
PER_#25G_70G	.929	-.010	.218	-.147	-.161	-.128
PER_LESS#6G	-.763	-.490	.001	-.051	-.109	.347
PER_MORE2VEH	.628	-.241	.639	.186	-.059	.097
PER1_2VEHS	.829	-.367	.380	-.017	.026	-.116
PER_NOVEH	-.794	.337	-.497	-.059	.005	.042
PER_LANDL	-.097	.607	.305	.599	.079	.402
PER_TENA	.136	-.760	-.505	-.288	.058	.112
PER_18_30YRS	-.598	-.648	-.025	.431	.010	.063
PER_31_55YRS	.638	.251	-.170	-.652	-.193	.119
PER_MORETHAN_ 55YRS	.197	.833	.282	.133	.252	-.281
PER_MALE	.606	-.420	-.448	.431	.054	.227
PER_FEM	-.606	.420	.448	-.431	-.054	-.227
PER_SNG	-.491	-.833	.015	.136	.194	.072
PER_MAR	.655	.664	-.088	-.122	-.271	-.030
PER_1_4PERSONS	.916	.018	-.198	.214	-.171	.207
PER_GREATR_ 10PERSONS	-.882	.128	-.038	-.336	.287	.057
PER_LESS10YRS	-.230	-.895	.293	-.144	.073	-.175
PER_GREATR10YRS	.229	.893	-.301	.159	-.071	.157
PER_INDIGENE	-.616	-.140	.248	.129	-.679	.024
PER_NON_INDIGENE	.621	.134	-.238	-.145	.680	-.029

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

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Appendix 3 : Canonical Correlation Model

Run MATRIX procedure:

Correlations for Set-1

	FCI	FNI	HSI
FCI	1.0000	.5804	.3330
FNI	.5804	1.0000	.5737
HSI	.3330	.5737	1.0000

Correlations for Set-2

	RCM	SEC	BEF
RCM	1.0000	-.3593	-.6842
SEC	-.3593	1.0000	.5500
BEF	-.6842	.5500	1.0000

Correlations Between Set-1 and Set-2

	RCM	SEC	BEF
FCI	.0550	.2132	.1260
FNI	.4236	.1357	.2199
HSI	-.1547	.4875	.7988

Canonical Correlations

1	.995
2	.695
3	.181

Test that remaining correlations are zero:

	Wilk's	Chi-SQ	DF	Sig.
1	.005	70.455	9.000	.000
2	.500	9.346	4.000	.053
3	.967	.448	1.000	.503

Standardized Canonical Coefficients for Set-1

	1	2	3
FCI	.292	.452	1.104
FNI	-.436	-1.338	-.129
HSI	-.794	.913	-.164

Raw Canonical Coefficients for Set-1

	1	2	3
FCI	.292	.452	1.104
FNI	-.436	-1.338	-.129
HSI	-.794	.913	-.164

Standardized Canonical Coefficients for Set-2

	1	2	3
RCM	-.984	-.945	.144
SEC	.020	.207	1.180
BEF	-1.381	-.052	-.663

Raw Canonical Coefficients for Set-2

	1	2	3
RCM	-.984	-.945	.144
SEC	.020	.207	1.180
BEF	-1.381	-.052	-.663

Canonical Loadings for Set-1

	1	2	3
FCI	-.225	-.021	.974
FNI	-.722	-.552	.417
HSI	-.946	.296	.130

Cross Loadings for Set-1

	1	2	3
FCI	-.224	-.014	.176
FNI	-.718	-.384	.075
HSI	-.941	.206	.023

Canonical Loadings for Set-2

	1	2	3
RCM	-.046	-.984	.174
SEC	-.386	.518	.763
BEF	-.697	.708	-.112

Cross Loadings for Set-2

	1	2	3
RCM	-.046	-.683	.031
SEC	-.384	.360	.138
BEF	-.693	.492	-.020

Redundancy Analysis:

Proportion of Variance of Set-1 Explained by Its Own Can. Var.

	Prop Var
CV1-1	.489
CV1-2	.131
CV1-3	.380

Proportion of Variance of Set-1 Explained by Opposite Can.Var.

	Prop Var
CV2-1	.484
CV2-2	.063
CV2-3	.012

Proportion of Variance of Set-2 Explained by Its Own Can. Var.

	Prop Var
CV2-1	.212
CV2-2	.579
CV2-3	.209

Proportion of Variance of Set-2 Explained by Opposite Can. Var.

	Prop Var
CV1-1	.210
CV1-2	.280
CV1-3	.007

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