Crime Theories and Incidences of Crime in Kuala Lumpur: A Spatial Perspective

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INTRODUCTION

This article will examine the influence of geographical features over the incidences of crime. Geographical features have significantly characterized our physical environment. Spatial factors such as places, distributions of people and the locations of activities have clearly indicated the potentials for and possibilities of crime incidences. From the geographical perspective, aspects of place and location are thought to contribute significantly to the occurrences of crime. Further, the characteristics of places and locations are thought to define clearly the nature and contextual framework of crimes. This can be associated with Tobler’s first law of geography that can be summarized as ‘everything is related to everything else but near things are more related to the distant things’. For example, locations that are in close proximity to pubs and bars have a tendency towards higher incidences of crime than areas further away from the pubs and bars.

As a general rule, in any social science research, the applications of related theories are vital to explain and to strengthen the facts and findings of the study. Moreover, it will elaborate the nature of geographical phenomena. In other words, theories will guide and provide better insights to the researchers. This article will look at some of the relevant theories that are pertinent to the occurrences of crime with a focus on the crime theories that are related to the aspects of place and location.

Over the years, the deliberation of crime theories related to places and locations can also be displayed through maps and mapping techniques. The geographical aspects of place and location can be better explained by the visualization of maps and mapping by giving an overall context of the phenomena. In describing the relationship between spatial analysis and GIS, Kraak viewed that maps are important tools to visualize spatial data, to reveal and understand spatial distributions and relations (Kraak 2005). Hence, the introduction of Geographic Information System (GIS) applications have successfully provided a fresh alternative to explain and elaborate further the crime theories related to the places and locations.

THE APPLICATION OF GEOSPATIAL TOOLS

The advancement of the field of information technology has contributed to utilizing the various applications of Geographic Information Systems (GIS) in various fields. Moreover, GIS to date has been recognized widely as a successful tool to view various issues and problems particularly from the geographical perspective. There are various conceptual statements and definitions made on what actually constitutes the GIS. As a generally accepted notion, the GIS refers to a computer system for capturing, storing, querying, analyzing and displaying geospatial data (Chang 2008; Bernhardsen 2002; Rogerson & Fotheringham 2002; Masser 1998 and Longley et al 2005). Obviously, ‘geographical’ is referring to the geographical data on based events and location on earth, while the information system is associated with the computer hardware and software used for processing and analyzing data.
The terms and definitions of the GIS clearly provide the identities and characteristics of spatial features on earth. Fischer et al. (1996) explained that the ability of the GIS to handle and analyze spatial data is usually seen as the characteristic that most distinguish them from other information, the computer-aided design and map production system. Therefore, the significance of the GIS lies in providing for the integration of large numbers of different data sets from many application fields in various sectors.

In view of the importance of the GIS, Longley et al. (2005) and Goodchild (1992) pointed out that the GIS are now used extensively in the government, business and research for a wide range of applications including environmental resources analysis, land use planning, real estate analysis, locational analysis, tax appraisal, and demographic analysis. The rapid development of various GIS applications is not only for geography professionals but has also proven to be significantly important to non-geographers including surveyors, criminologists, urban and regional planners, marketing and business analysts, historians, etc. Thus, the next section will explore some of the various GIS applications and its benefit towards the analysis of crime.

AN OVERVIEW OF CRIME THEORIES FROM THE SPATIAL PERSPECTIVE

From the geographic perspective, crimes have often been associated with place and location, series of movement and event, and temporal change. It is observed that geographical factors such as the location of police stations, public facilities, schools, business and commercial premises, or residential areas, potentially have a great influence over the patterns of crime rates in that particular area (Abeeyie and Harries 1980; Felton and Clarke 1998). Additionally, in the geography-based analysis, the pattern and distribution of crimes are not evenly distributed whereby it can be concentrated in particular locations due to certain factors, and this phenomenon is normally identified by most researchers as a ‘hot spot’ for crime.

Crime theories related to assaults could be best explained by crime mapping. According to Ratcliffe (2000) and Chainey and Ratcliffe (2005), the number of crimes in a particular location will be indicated by mapping the symbol of points. Crime mapping is normally underpinned by the occurrences of crime at specific locations or places. At this point, the issues and questions might be directed to the questions as to which places tend to be common grounds for vandalism or robberies and at which places are they not occurring. Eck (2005) emphasizes that crime phenomena at this level occur as points, so the appropriate units of analysis are addresses, street corners, and other very small places, which are typically represented on maps as dots.

The occurrence of crime in specific places could be associated compatibly with the crime theories. It is believed that there are various types of crimes that tend to take place in different types of locations. Theories that fit the crime will provide appropriate guidance to further explain the occurrence of crime in certain places. For example, the Routine Activity Theory (RAT) provides a clear description of the nature of crime and place. This theory was developed by Lawrence Cohen and Marcus Felon in 1979, which has often been linked with the elements of place.

The theory states that a crime occurrence is to be anticipated when the following three elements come together in any given space and time, (a) an accessible target (b) the absence of capable guardians that could intervene, and (c) the presence of motivated offenders. According to the NSW Attorney General’s Department (www.crimeprevention.nsw.gov.au), RAT has also listed 3 categories of crime target which is a person, an object, and a place. Eck (2005) stresses that RAT helps to explain why crime is often concentrated at specific places. Figure 1 shows the concentration of commercial premises and entertainment establishments in the Federal Territory of Kuala Lumpur that can easily be potential crime targets.

Felton and Clarke (1998) further proposed that targeted places such as residential areas, convenience stores, and business premises, among others, should have a value, inertia, access and visibility or better known as VIVA. It is suggested that the major advantage of this theory is that it can be applied to any different types of studies and crimes including property and violent crimes. For example, the location of a convenience store can be easily targeted if the premise does not provide enough protection and the offender is able to have access to the target and escape.

The concentration of crime in specific areas can also be explained by other crime theories. All these crime theories provide useful information to the researcher to comprehend the spatial patterns of crime in particular areas. These include the Social Disorganization Theory, Social Efficacy Theory, the Broken Windows Theory and Crime Opportunity Theory.

Generally, the Social Disorganization Theory was applied to the explanation of crime and other social problems by sociologists at the University of Chicago in the early 1960s and can be defined in terms of the absence or breakdown of certain types of relationships among people and the environment (Jensen 2003). This theory was developed to examine the crime patterns in major urban areas such as Chicago and other cities. Herbert (1982) noted that the Social Disorganization Theory predicts large numbers of offenders in areas and among groups which are typified by social disorganization.

Carlin Wong et al. (2009) suggested that the link between social disorganization and delinquency is associated with theories developed by two sociologists, Clifford R. Shaw and Henry D. McKay. Shaw and McKay wanted to demonstrate how crime was a normal response to social, structural, and cultural characteristics of any given community and to explain how deviant behaviour was produced.
among lower class urban males. Shaw and McKay further believed that the Social Disorganization Theory could be applied to the passage of nationality groups through the spatial grid of the city. Studies by Shaw and McKay further noted that (a) the rates of juvenile delinquency were consistent with an ordered spatial pattern (b) there was an identical spatial pattern revealed by various other indices of social problems (c) the spatial pattern of delinquency rates showed significant long term stability even though the national structure of the population in the inner city areas changes greatly throughout the decades, and (d) within the inner city areas, the course of becoming delinquent occurred through a network of interpersonal relationships involving family, gangs, and neighbourhood.

Another theory that relates with crime concentration is the Social Efficacy Theory. Samson et al. (1997) define social efficacy as social cohesion among neighbours combined with their willingness to intervene on behalf of the common good that is linked with reduced violence. Filbert (2008) emphasized that social efficacy may help prevent crime whereby a neighbourhood with high social efficacy would normally have less crime and disorder. Therefore, in relation with crime prevention measures, high level of social cohesion and characteristics of group of community considerably influence the level of neighbourhood concentrations of crime.

The Broken Windows Theory is another theory to explain crime concentration. This theory was developed by James Q. Wilson and George L. Kelling. Whilst referring to this theory, Eck (2005) and Filbert (2008) stated that in most well-functioning neighbourhoods, small transgressions of social norms resulted in social pressures to bring the offending party into compliance. However, once a place becomes untended, it undermines the willingness and ability of residents to enforce social order.

In elucidating their theory, Wilson and Kelling (1982) stressed that if the window in a building is broken and is left unrepaired, all the windows will soon be broken. Window breaking does not necessarily occur on a large scale. It is that an unrepaired broken window is taken as a signal that no one cares and that breaking window costs nothing. Therefore, the theorists propose a strategy to fix the broken windows within a short time, say, a day or a week, in the belief that vandals would be much less likely to break more windows.

To conclude the theoretical discussion, the theory of crime can significantly be used to describe and explain the phenomenon of concentration of crime in a specific place and location. Most vital is its ability to associate crime occurrences with spatial aspects such as place, neighbourhood and location. Furthermore, spatial elements such as distance and density are also closely associated to the socioeconomic characteristics of a particular neighbourhood area. Besides that, there are various approaches to examine the pattern and feature of crime occurrences specifically to determine the association between crime theories and crime incidences. Figure 2 presents a summary of the crime theories which relate to concentrations of crime locations or the crime hot spots.

**SPATIAL ANALYSIS FOR CRIME THEORIES**

The advancement and development of the GIS and spatial analysis applications have increased the ability of analysts to examine closely the spatial patterns and distributions of crime. Analysing and visualizing the information on maps normally require precise, good quality and large amounts of data. Nevertheless, according to Cameron (2005), the GIS has the ability to handle large amounts of data and analyse data more rigorously as a way of generating new hypothesis from the data by identifying unexpected spatial patterns.

Based on the related crime theories, this section will synthesize several techniques in relation to the GIS particularly for the visualization of crime patterns and distributions. Theoretically, the visualization of crime patterns and their distribution will be able to identify the related factors for crime concentration in geographical locations. The following section will also elaborate further some GIS techniques used in the crime analysis. Figure 3 represents the linkage between the application of the GIS and the identification of the crime hot spots.

In general, a GIS technology has been designed to deal with geographical data. In fact, various fields of study have expressed interest in its application. According to Chang (2008), spatial data describes the locations of spatial features which may be discrete or continuous, and among the discrete features, there are points. Heywood et al. (2002) described that points are used to represent features that are very small to be represented as areas. Chang (2008) further explained that a point has 0 dim ension and has only the property of location. Additionally, a point may be called a node, vertex, or 0-cell and a point feature is made of a point or set of separate points. Mitchell (1999) proposed that a good example of point is the address location of crime, as points having a pair of geographic coordinates.

According to Ratcliffe (2000), the number of crimes in a particular location will be indicated by mapping the symbol of points as shown on the map in Figure 4. Figure 4 below shows the distribution of aggregated assaults in 18 police beats in Kuala Lumpur which is indicated by dot points. The recorded assault incidents were aggregated and represented by each major police station. Therefore, each point has a value of reported cases of assault within the police station's operational area.

In view of the above crime theories, the occurrences of crime are normally concentrated in specific places and locations. Therefore, Figure 4 displays the concentration of total assaults which are represented by dot points. Apparently the concentrations of assaults are located in the city centre and up further to the northern part of Kuala Lumpur. Obviously, the concentrations of assaults especially in the city centre are driven by the location of commercial premises. Meanwhile, the high-densely populated areas in the northern part of the city is a possible major factor for the high concentrations of assaults there. This is also pertinent to the crime theory which places emphasis on a high level of social cohesion and that the characteristics of the community considerably influences the level...
Similarly, the concentration of assaults can also be displayed or represented by geographical patterns such as the level of density and concentration of features in a particular area. For instance, the concentration of assaults in 18 police beats can be shown in Figure 4. The choropleth map shows that there is a high level of assaults in the city centre, followed by regions in the north and south-east of the city. Therefore, most researchers have suggested several theories related to spatial concentrations of crime or hot spots, such as the Social Disorganization Theory, Broken Windows Theory, and Rational Activity Theory (RAT) can be linked to this scenario.

A significant geographical aspect influencing crime occurrences is the characteristics of place and location which have a great influence over the occurrence of various types of crime. As explained by the RAT theory above, the routine activities committed by a group of people frequenting entertainment establishments probably will attract the attention of snatch thieves or assailants (refer Figure 6). Usually, when people get drunk after heavy alcohol consumption, they can become an easy target for criminals. The locations of entertainment establishments are also normally located in the urban areas, and therefore, are inclined to be exposed more to the alcohol-related crime and violence.

For example, a study on city centre violence by Ingemann-Hansen and Brink (2004) has found out that 46% of assault victims from Aarhus (Denmark) city centre are assaulted in public houses or the street nearby compared to 5% of victims in the district outside the city centre. Ingemann-Hansen and Brink further clarified that those victims who are assaulted in the city are more frequently under the influence of alcohol than victims from the outside. Moreover, Newton et al. (2008) in their study on two main streets in the Birmingham City Centre have found that violence and criminal damage are concentrated in areas where there is a lot of licensed premises.

Crime theories such as the Social Disorganization Theory and Broken Windows Theory have advocated the idea of lack of guardianship in a particular neighbourhood area as a trigger for crime occurrences. With regards to this research, the number of police stations would have a great influence over controlling and minimizing the level of crime rates. The large number of police stations represents high levels of guardianships that predominate in the particular area. This circumstance can be shown below in Figure 7.
The above map displays the overlay map between all police stations in Kuala Lumpur which is represented by points and the number of reported assaults which are represented by dot points. The above map demonstrates distinctly that the location of police stations have a great influence over the level of crime rates. Apparently, there are low numbers of assaults particularly in the south-east of the city, whereby there is a sizeable number of police stations in that area.

Conversely, there is a high number of assaults in the north-west of the city whereby there is a lack of police stations in that region. Nevertheless, the application of the above crime theories can be questioned whereby there are still high numbers of assaults in the city centre even though there are many police stations in the city centre. However, it can be explained by the advocates of the Social Disorganization Theory which explains that the occurrences of crime normally take place in the urban areas, especially the city centre where there is a disproportionate amount of activity happening there as compared to other places.
The theories of crime above also emphasized the socio-economic aspects as the dominant factor and which is fundamental to crime occurrences. For example, the theory of Broken Window is of the opinion that the instability and weaknesses of the socio-economic structure of urban communities significantly contribute to the level of crime. With reference to the aspect of educational level and the ethnicity of the communities, this crime theory can be correlated to this circumstance as shown in Figures 8 and 9.

Figure 8 shows how the instability of the socio-economic structure of the society as defined by the Broken Window Theory and Social Disorganization Theory has a great influence on the high crime rate. The level of education reflects the status of socio-economic structures. The crime theories suggest that crime rates are relatively high in the neighbourhood areas with poor educational background. As shown in Figure 8, the urban population who have never attended school significantly contribute to the reported assaults.

Figure 8: Map of reported assaults & non-attendance at school.

Figure 9: Map of reported assaults and Indian ethnic group.
Source: GIS Processing
The literature also illustrates that the racial and ethnic aspects of the minority groups have high propensity towards committing crimes. The crime theories also suggested that these racial and ethnic backgrounds with poor socio-economic status can relatively be associated with crimes. Figure 9 shows that the dense population of ethnic Indians in the north-east of the city may contribute to the number of assaults. Amar Singh Sidhu (2005) confirmed statistically that the Indians form a major contributor towards cases of crime such as gang-related activities and also in other forms of social ills e.g. alcoholism, drug addiction etc. He concluded that serious crime cases involving the Indians as an ethnic group are attributed mainly by the urban poverty.

**CONCLUSION**

Generally, the theories selected above seem capable of explaining and justifying the patterns of crime occurrences. However, these theories can be supported by other applications to further strengthen their justification. This article seeks to justify the crime theories related to the geographical features which are further supported by spatial analysis. The use of GIS applications specifically to address spatial issues highlighted by crime theories has successfully been visualised and analysed through mapping techniques shown here in this article. For example, high concentration of crime incidents in a particular area will provide a clear indicator for crime ‘hot spots’. Therefore, GIS tools and techniques provide us with a variety of ways to make a more meaningful description of spatial interactions.

Moreover, the place and location of other geographical features also can be displayed on map as possible indicator that can trigger crime incidents. Significantly, the geographical features provide an overview of the current urban scenario and it can be explained by the crimes-related theories. Consequently, the policy makers and the stakeholders are able to formulate strategies particularly for crime prevention, based on the related crime theories and GIS tools that have been mentioned here.

**BIBLIOGRAPHY**


