A Structural Analysis of Social Disorganisation and Crime in Rural Communities in Australia

Patrick C. Jobes,[1] Joseph F. Donnermeyer,[2] Elaine Barclay[3] and Herb Weinand[4]

This article published in *The Australian and New Zealand Journal of Criminology*,

Volume 37, Issue 1 (2004). Published by Australian Academic Press Pty. Ltd.

The Australian and New Zealand Journal of Criminology home page:

http://www.australianacademicpress.com.au/Publications/Journals/Criminology/Criminology.htm

Abstract

This paper extends research on rural crime beyond North America by analysing associations between census measures of community structures and officially reported crime in rural New South Wales (Australia). It employs social disorganisation theory to examine variations in crime rates between different kinds of rural communities. A typology of rural communities was developed from cluster analysis of demographic, economic and social structural measures of rural local government areas (LGAs) in NSW. Six distinct types of rural communities were found to have unique crime characteristics. Structural measures were statistically associated with four types of crime. Overall, the findings support social disorganisation theory. Crime generally decreased across an urban-rural continuum, and more cohesive and integrated community structures had less crime. One highly disorganised type of small community had extremely high crime. These analyses demonstrate how specific structures of rural places are linked to rural crime.

---

[1] Associate Professor, School of School of Social Science, University of New England, Armidale, New South Wales, Australia. Dr Jobes received his Ph.D (Sociology) from the University of Washington in 1970.

[2] Professor, Department of Human and Community Resource Development, The Ohio State University, Columbus, Ohio, USA. His Ph.D (Sociology) was received from the University of Kentucky, Lexington in 1977.

[3] Project Director, Institute for Rural Futures, University of New England, Armidale, New South Wales, Australia. Ms Barclay received a BA (Psychology) Honours from the University of New England in 1995.
Ms Barclay will complete a Ph.D in rural criminology in 2003.

[4] Honorary Research Fellow, School of Human and Environmental Studies, University of New England, Armidale, New South Wales, Australia. Mr Weinand holds a Master of Science conferred by the University of Wisconsin in 1969.

A Structural Analysis of Social Disorganisation and Crime in Rural Communities in Australia

Introduction

This paper summarises analyses of crime in rural areas of New South Wales (NSW), Australia. The analyses, description and interpretation of the data follow the structural differentiation approach (Sampson, 1985; Sampson, Raudenbush, & Earls, 1997). The kinds of structures of which people are part, the kinds of processes that operate within the structures, and the kinds of positions they occupy within the structures, largely determine how people engage in crime. The empirical purpose of the analyses is to identify and measure how variations in community characteristics are linked to crime in rural Australia. The theoretical purpose is to test whether social disorganisation forms the foundation for the empirical findings.

Data analyses are presented for rates of four types of crime in rural Australia; assault, break and enter, malicious damage, and motor vehicle theft. Measures of demographic, economic and social characteristics are drawn from the 1996 Census and comprise the independent variables, that is, variables that theoretically are associated with, and antecedent to the crimes. Three types of summaries are presented. First, statistical summaries describe the quantitative empirical relationships between the structural variables being analysed. These include regression analyses, the development of cluster analyses for rural community structures, and analyses of variance of crime between clusters. Second, graphic summaries portray the geographical distributions of many of those relationships in rural areas. Third, the quantitative analyses are interpreted through a social disorganisation perspective.

Non-metropolitan Local Government Areas (LGAs) in New South Wales were the source of measures of community for the analyses of secondary data. These LGAs ranged from very rural and remote locations to those bordering on metropolitan areas. The analysis found that rural communities in Australia fall into six distinct types. Analyses further indicate that those clusters have distinct patterns of crime. The distributions of crime can largely be explained through a social disorganisation orientation.

Structural Analysis of Crime and Social Disorganisation

Thorsten Sellin (1938) long ago articulated the foundation of criminology as the study of how normative structures and processes influence criminal behaviour. The structural orientation assumes that behaviour occurs in a geographic location because of local structures and their influences. Structural factors influence whether people

become criminal or law-abiding (Beirne & Messerschmidt, 1995). Structures also influence their substantive types of behaviour. The types of crimes criminals commit are strongly influenced by their position in the social system and the nature of that social system (Blumstein, Cohen, Roth, & Visher, 1986). Stable structures that are more homogeneous are assumed to be more cohesive and integrated, that is, more socially organised (Carter, Phillips, Donnermeyer, & Wurschmidt, 1982).

In this study, the community is the unit of analysis. The object of this analysis is to describe the relationship between crime and the contemporary structure of rural communities in Australia. This research broadens the understanding of both the facts of rural crime, and the factors that underlie the processes that lead to crime to rural Australia. It starts with the simple assumptions that rural communities in Australia are quite diverse, and that rural communities can vary greatly in structure and how this structure influences crime rates.

Rural communities have long been identified as different from urban places (Durkheim, 1933). However, focusing on rural crime in modern societies requires some acknowledgment of urban settings for two reasons. First, as part of the larger *gesellschaft*, people in rural areas are subject to many ubiquitous influences from urban society (Toennies, 1957). Fischer (1980) maintains that rural areas in urban societies evolve toward and follow urban trends in both social organisation and crime. The same organisation and processes that influence behaviour in cities are present in many rural areas in a somewhat modified form (Thurman & McGarrell, 1997; Weisheit & Donnermeyer, 2000). Second, there is no absolute and definitive distinction between either the conceptual or geographic boundaries of urban and rural areas, or metropolitan and non-metropolitan areas.

However valid and reliable conceptual or geographic distinctions may be, there is inevitably potential error in classification of rural areas (Fuguitt & Beale, 1996; Hawley, 1986). The exact distance that designates what places are remote and the exact number of people that distinguishes rural from urban are based upon somewhat arbitrary criteria. Fortunately, criteria are known, if not entirely agreed upon. For example, alternative census definitions of rural exist. The validity of the interpretations rests largely on the composite description of a variety of comparisons within the data analyses. Particularly important is the degree to which findings consistently conform or diverge across the continua implied by the variables being investigated. Errors in classification, and consequential measurement based upon the classification, may ultimately lead to errors in description and theoretical interpretation, such as ecological correlation (Robinson, 1950). Large data sets lend considerable strength to generalising from statistical analyses (Schwirian, 1973). Their sources of error are relatively transparent and open to criticism and re-testing. Importantly, they provide available data to initiate analyses that may be explored in more depth through qualitative analyses.

Most established theories in criminology are organised around structural analyses. Structural Functional theories, of course, are devoted to identifying structures and describing how they cause crime (Cohen, 1955; Merton, 1938). The theory of Differential Association describes the interaction system that determines how criminal behaviour is learned (Sutherland, 1942). More recent Social Learning theories emphasise psychological predispositions for that learning (Bandura, 1973; Burgess & Akers, 1966). Social Control Theories identify particular structures, especially family and school, and the processes that link individuals to criminal behaviour (Hirschi, 1969). Conflict Theories are based on structural analyses, describing how social institutions create differential advantages among members of society (Quinney, 1970). Even some Social Construction theorists regard a structural approach as a starting point for analysis, though they seek to answer the essential question of how societies construct the meaning of crime and the societal responses to that meaning (Kitsuse & Spector, 1973; Gusfield, 1963). Despite the variety of theories in criminology, investigators who use large data sets must rely on a similar limited set of measures.

A social disorganisation orientation has been adopted for the following analyses. Developed by the Chicago School of Sociology, it takes an ecological approach to the study of crime by assuming that the spatial distribution of various crime types is reflective of organisational differentiation (Sampson, 1985; Sampson, Raudenbush & Earls, 1997). Social disorganisation is especially appropriate when the unit of analysis is the community (Salamon, 1997). It was the foundation of subsequent structural theories and remains an established and robust orientation for organising data and describing community structure and crime (Beirne & Messerschmidt, 1995). This versatility is valuable for studying geographic regions that have received limited secondary data analysis. Cities, structures that generally are larger, denser and more heterogeneous, have been found to be more disorganised and to have higher crime than rural communities (Kowalski & Duffield, 1990; Weisheit & Donnermeyer, 2000). With some clear exceptions, such as the US Black Belt (Bachman, 1992) and Indian Reservations (Jensen, Stauss, & Harris, 1977), rural areas typically have less evidence of disorganisation than metropolitan communities (Sampson, 1986). That is, rural areas typically have more intact families, more stable populations, greater homogeneity and social bonding (Gardner & Shoemaker, 1989). They have more meaningful personal interaction, what Freudenberg (1986) terms, “density of acquaintanceship”. Although these basic urban-rural distinctions persist, it is also true that rural communities themselves are quite diverse. Their crime rates will vary according to the levels of disorganisation characterised by different types of non-urban places. Further, social disorganisation theory can be a useful heuristic for examining these variations.

Rural Crime in Australia

Criminologists in the United States have maintained a limited, yet continual interest in rural crime since before the mid 20th century (Clinard, 1944). During the past few years, considerable interest in rural crime has been sparked (McDonald, Wood, & Phlug, 1996; Thurman & McGarrell, 1997; Weisheit, Wells, & Falcone, 1995; Weisheit & Donnermeyer, 2000; Donnermeyer & Jobes, 2000). Research on rural social problems had been uncommon in the industrialised world (Summers, 1991) and almost non-existent in Third World nations (Wallerstein, 1975; Edwards & Donnermeyer, 2002). Until recently, rural crime research has been especially rare in Australia, despite its immense rural expanses. The empirical works of O'Connor and Gray (1989) and Devery (1991), and the review of the literature by Hogg and Carrington (1998) are among the few exceptions. These and other studies indicate that crime in rural Australia is extremely diverse. The incidence of crime ranges from relatively low in bucolic communities like Walcha, described by O'Connor and Gray (1989), to comparatively high in a few towns in Western Australia (Harding, Morgan, Ferrante, Loh, & Fernandez, 1997). Especially high rates of crime and instances of animosity have been noted in conjunction with Indigenous people [1] (Cunneen, 1990).

There is no clear and absolute character to rural crime (Weisheit, Falcone, & Wells, 1999). Styles of crime typically considered to be part of metropolitan areas, such as gangs, also occur in small towns and the country (Short, 1998). Gangs with multiple drug and theft violations among their members are now regularly reported in the popular press for rural areas throughout the United States and Australia (Williams, 1999). Rural crime merits analysis in its own right. Importantly, such analyses may help to understand and explain many aspects of crime, including urban crime.

Law enforcement in NSW is through a state police service, in contrast to countries like the US and Canada, where rural law enforcement is administered through a variety of municipal, county and state agencies. As employees of a single police force, all officers in rural areas are obligated to enforce the same laws through the same procedures. The single police service is a form of natural experimental control in comparison to other nations. A recent study by Jobes (2002) found rural officers in NSW used some discretion in their enforcement of the law. While they universally enforced felonies, they varied in the strictness with which they enforced lesser laws commensurate with community expectations and support, and to partially resolve strains between being a law enforcer and a good citizen. Nevertheless, since there is a single law enforcement agency, there probably are fewer biases due to differential policing than occur in many other countries. This enhances the theoretical and empirical significance of examining variations in crime rates between different kinds of rural communities of Australia.

Social Disorganisation Theory and Crime in Rural Australia

Structures are identifiable conditions that influence behaviour through their operating processes (Parsons, 1961). This includes the process of defining someone as a criminal, as well as the act of engaging in crime. As used here, structural analysis need not imply some functional evolution that established the structure. Disintegrating, chaotic places put people in harms way, making those dangers imminent and difficult to avoid.

Advanced societies, like Australia, have diverse community structures. Within the same general sphere of activities, like the economy, there are several levels of size and abstraction. At the largest and most abstract level is the entirety of all activities devoted to a single sphere, an institution. All institutions have attendant activities that describe them. At a large and concrete level, there are macro structures within the economy, including corporations and agricultural cooperatives, to name only two. However, even in the most urban and industrialised society there are small personal structures. Working day after day in a small office or with a work crew establishes personal, face-to-face groups. Under supportive conditions, work groups often become persistent and important microstructures for their members. Similarly, neighbours who live next to each other in the same area for many years often become a cohesive and supportive group because their small enclave treats its members personally through face-to-face communication.

Social scientists have disagreed about the meaning of rural and urban (Dewey, 1960) and what is meant by rural versus urban communities (Hillery, 1955; Jobes, 1987). Dewey's school of thought believes the distinction is almost meaningless because ubiquitous modernisation has largely eradicated differences between the characteristics of people who live in rural places and their city cousins. Rapid transportation has made remote places accessible (Wardwell, 1977). Access to communications and information is increasingly the same in both settings. This school of thought contends that while rural and urban populations differ in many respects, such as population density and employment in extractive industries, those differences are relatively unimportant for explaining their respective behaviours. While there is no absolute meaning of rural, nor an absolute distinction between rural and urban, differences between rural and urban, countryside and city, exist and can help to explain crime. Further, a consideration of rural-urban distinctions is necessary in order to understand variations across the range of places encompassed by the concept of rural (and the same applies to the concept of urban, as well).

Social disorganisation theory starts with the structural-level assumption that crime is based on a lack of shared values and beliefs among members of a community, and an inability to solve common problems (Sampson & Groves, 1989; Bursik & Gransmick, 1999; Osgood & Chambers, 2000). In essence, communities with high density of acquaintanceship through informal interaction and shared membership in local groups will exhibit comparatively

lower crime (Freudenberg, 1986). Bursik and Gransmick (1999) specify two ways this occurs within a community. First, strong informal relations among such primary groups as neighbours, friendship groups, cliques, and extended family creates a density of acquaintanceship that control the behaviour of members. The cost of deviance is too high because the mechanisms by which these costs are incurred by individuals are frequently through gossip and ostracism. Second, community membership within these various primary groups overlaps to a considerable extent. They exhibit an extended density of acquaintanceship that cuts across variation in groups by demographic and social class characteristics, and neighbourhoods as well. Further, it is not only internal cohesion that counts. External control presents a third dimension of social disorganisation. The ability of communities to maintain external relationships through which outside resources can be gained and through which undesirable influences can be reduced helps to maintain the established structure.

This study applies social disorganisation theory to variations in crime rates among rural communities of New South Wales. It examines the five dimensions of disorganisation typically specified by the theory (Sampson & Groves, 1989; Bursick & Gransmick, 1999; Tittle, 2000), namely, residential instability (i.e., high turnover), ethnic heterogeneity or diversity, family disruption (i.e., divorce, single parent households, and other forms of unshared parenting), low economic status (i.e., poverty, unemployed and other economic indicators associated with residential instability and ethnic heterogeneity), and population (i.e., size, density and proximity to urban place). According to social disorganisation theory, each of these dimensions disrupt the establishment of informal social ties, internal cohesion among members and density of acquaintanceship that control criminal behaviour.

Restricting analyses to rural crimes serves several purposes. Most importantly, the neglected subject of rural crime merits analysis in its own right. Examination of rural crime may help to understand crime in the rest of society. Understanding crime in one context contributes to understanding crime in others. Rural areas in modern nations are extremely varied. They have structures that range from being closely similar to those in cities to being extremely different. In effect, comparisons of rural areas permit a natural quasi-experiment for discovering some of the causal factors for any social setting, including urban areas (Cook & Campbell, 1979).

Several recent studies have examined variations in rural crime rates using, explicitly or implicitly, a social disorganisation perspective. The concept of urbanism was articulated by Wirth (1938), also associated with the Chicago School of Sociology. Wirth argued that places exhibiting dense, heterogenous populations lessen community cohesions (i.e., social disorganisation). Both population size and density remain central measures of social disorganisation. However, social disorganisation theory differs from Wirth's argument insofar as primacy is

not given to population size and density. Urbanism is but one among many dimensions defining the structural characteristics of places.

Tittle (1989) and Ingram (1993) examined the relationship between crime and urbanism, including consideration of size of place, both using survey data of individuals, but measuring their residential location. Tittle (1989) noted that urbanism, which he defined as tolerance for deviance and unconventional ties, lack of strong social bonds, alienation, and anonymity, was predictive of higher crime, and that urbanism was related to size of place. Ingram (1993) re-examined the argument that size of place determines urbanism, which, in turn, predicts delinquency. His research found that urbanism was more important than location on predicting delinquency, but that location (or urbaneness) was predictive of urbanism. In other words, place or community alone (rural versus urban or non-metropolitan versus metropolitan) cannot explain crime, but community becomes important because different communities exhibit varying degrees of social disorganisation.

Two recent studies of variations in rural crime rates in the U.S. explicitly utilised a social disorganisation framework. Osgood and Chambers (2000) examined rates of arrests for juvenile violence among 264 non-metropolitan counties in the Midwest and Southern regions. They hypothesized that juvenile violence would be related to residential instability, ethnic heterogeneity, family disruption, low economic status, and population density. Except for low economic status, which was measured by poverty rates, each of the hypothesized relationships were confirmed. Further, they found that poverty and residential instability were negatively related in these rural settings, which is the opposite of what is normally found in urban settings. They concluded that despite this anomalous finding, their results were consistent with social disorganisation theory and that the basic tenets of the theory can be extended to test variations in crime rates for smaller places.

Barnett and Mencken (2002) used the same five core concepts of social disorganisation theory as Osgood and Chambers (2000), and tested its tenets on variations in the FBI's Index of property and violent crime for all non-metropolitan counties in the 48 contiguous states (excluding Alaska and Hawaii). Their results indicated that non-metropolitan counties that were "resource disadvantaged" (based on poverty rates, income inequality, unemployment, and percent of female-headed households) exhibited higher property and violent crime rates. However, contrary to research conducted in metropolitan counties, resource disadvantage was more predictive of violent and property crime rates in non-metropolitan counties that were losing population than in poor counties gaining population. In other words, the relationship of low economic status and crime was conditional upon population dynamics.

Other rural studies that either implicitly or explicitly utilised social disorganisation theory include (1) examinations of changes in criminal behaviour among long-term and newly arrived residents of rapid growth rural communities (Freudenburg & Jones, 1991); (2) homicide and rurality (Wilkinson, 1984a; Kowalski & Duffield, 1990); (3) patterns of offending by size of community (Laub, 1983), (4) levels of economic and social development (Rephann, 1999), and (5) poverty (Wilkinson, 1984b). More recently, Carcach (2001) has adopted a regional approach to the explanation of crime rates in rural Australia, utilising many of the assumptions of social disorganisation theory. Wilkinson's (1984b) work is especially interesting because he presumes that places that are most rural (very small populations and very remote) are also more easily disrupted by changes in population, unemployment, government policy etc.

Based on these considerations, we put forth two operating assumptions and two hypotheses to guide the analyses. The first operating assumption is that rural communities, as represented by LGAs, exhibit common demographic, economic, and social traits by which it is possible, through cluster analysis, to arrange into identifiable and distinct types. The second assumption follows the line of argument put forth by Wilkinson (1984b), that is, that social disorganisation is a characteristic of types of community, and is not strongly correlated with size of place, population density and similar measures. The two hypotheses are: (1) Rural communities (i.e., non-metropolitan LGAs) vary in their levels of social disorganisation, which is tested based on residential or population instability, ethnic heterogeneity, family disruption, low economic status, and population density; and (2) the more socially disorganised rural community types will exhibit higher rates of crime.

Methodology

Researchers who take a quantitative approach to the testing of social disorganisation rely primarily upon census data at the community and neighbourhood levels. These measures are presumed to be indicators of the social processes of control over behaviour as described above. The empirical indicators of community structure selected for this study match well with previous research (Heitgerd & Bursik, 1987; Sampson & Groves, 1989; Tittle, 1989; Ingram, 1993; Bellair, 1997; Smith, Frazee, & Davison, 2000; Osgood & Chambers, 2000). The assumption is made that the geographic locations, LGAs, are social units that respond to a variety of cultural, historic, political and economic influences. We do not assume that the geographic area is an economic unit, as did Becker (1968) in his seminal research; nor do we assume that it is an area of territorial familiarity, as did Hakim, Ovadia and Weinblatt (1978). Our methods permit comparisons of specific structures across these continua based on social disorganisation theory.

We adopted cluster analysis because it is a technique for identifying a common profile among cases based on a large number of variables. The primary use of cluster analysis is to group objects or cases together based on common characteristics they possess. It is a multivariate technique that defines the structure of the data by arranging similar observations together according to Euclidean or straight-line distance. In our case, rural communities are grouped together across a multiplicity of variables that measure demographic, economic, and social characteristics. In this way, we seek to establish types of rural communities, and then examine their profiles and whether or not they are similar to indicators of social disorganisation already established in the literature. Following this, we examine variations in crime rates across the clusters of communities.

The sample is composed of LGAs in NSW with fewer than 50,000 residents. A LGA is the smallest unit of government in Australia. Usually a LGA represents a municipality and surrounding rural areas, but it can be a municipality only, or a rural district adjacent to a regional centre. As the focus of this study is upon rural communities, the metropolitan statistical sub-divisions of Sydney, Newcastle, Wollongong, Tweed and Queanbeyan were excluded from the analysis leaving a sample size of 123 rural LGAs.

Analyses have been conducted on New South Wales Bureau of Crime Statistics and Research (BOCSAR, 1997) data sets. The BOCSAR data are complementary with other data sets, such as the Uniform Crime Reports (UCR). They have a large population and allow specification of most of the variables contained in UCR data. The BOCSAR data are large, reliable, and immediately accessible. They are suitable for both exploratory analysis and hypothesis testing. Four measures of rural crime are analysed as the dependent variable; motor vehicle theft, break and enter, assault, and malicious damage. Rather than one summary measure, these measures are analysed in order to examine whether structural variations across different types of crime are occurring. These allow measurement of the diverse and complex nature of rural crime. Since crimes against persons receive disproportionate attention while property crimes account for most criminal acts, it is important to distinguish the two. Break and enter and motor vehicle theft are measured because they reflect different patterns of property crime. Malicious damage is measured because it is neither theft nor personal assault, and occurs frequently and without economic incentives.

The independent variables were drawn from the *1996 Census of Population and Housing* (Australian Bureau of Statistics, 1997). In all, nineteen independent variables were used in the analyses. To reduce the problem of high correlation between census variables, all variables were converted to proportions of the total population. The variables selected have been reported to be reliable indicators of social organisation (Bursick 1986; Sampson, Raudenbush, & Earls 1997), as well as predisposing factors to crime (Devery, 1991). They included measures of: (a) residential instability, including migration, that is, the proportion of persons with a different address in another

Statistical Local Area (SLA)[2] since the 1991 Census, plus average annual growth, proportion of people in their own home, and the proportion of people living in caravans (mobile home); (b) ethnic heterogeneity, including proportion of Indigenous people in the community, and the proportion of those born overseas; (c) family disruption, including family structure, namely proportion of persons married, separated and divorced persons, plus proportion of sole parent families; (d) low economic status, including educational qualifications, namely proportion with tertiary qualifications, vocational skills and basic qualifications, average age at leaving school, unemployment rate, and both median individual and household income; and (e) population size and density. In addition, median age was included in order to control for its effect on crime rates. This follows the lead of Osgood and Chambers (2000), who found that non-metropolitan U.S. counties with very small juvenile populations also manifested very low arrest rates for juveniles. It can be argued that age is another proxy for residential instability insofar as the local economy of some rural Australian communities depends on young, seasonal workers. The theoretical assumption underlying the data analyses is that the presence of social disorganisation and crime are related. The cumulative effect of the independent variables: residential instability, ethnic heterogeneity, family disruption, low economic status, and population density will increase crime. A cumulative effect of crimes also is tested, that is, increases in one type of crime increases with other types of crime.

Three statistical approaches tested the assumption. First, standard multiple regression analyses tested the relationship between measures of community characteristics and crime. The regression analyses are similar to those conducted by many other researchers utilising social disorganisation theory, and most recently applied to rural communities by Rephann (1999) and Bellair (1997). Our goal was to identify the overall relationship between the census variables and the crime rates and establish how much of the relationship was uniquely contributed by each census variable. For this purpose, standard multiple regression where all independent variables are entered into the equation simultaneously, was the instrument of choice (Tabachnic and Fidell, 1989, p.143). Second, cluster analysis examined whether distinct categories of communities could be distinguished according to those structural characteristics. Cluster analysis can be used as both a deductive and an inductive statistical technique (Kaufman & Rousseau, 1990; Hair, Anderson, Tatham, & Black, 1999). It may be used deductively to test hypothesised relationships between independent and dependent variables. It also may be used inductively to identify relationships between variables. The inductive function is particularly valuable because findings reflect relationships that emerge from the data under the assumptions of the statistics, with minimal interference by the researcher. As such, the analyses may be regarded as independent tests that corroborate or challenge previous findings. The final step in the data analysis was to examine variations in the four crimes across the identified

clusters, by submitting them to analyses of variance. The use of these distinct methods, regression analysis, cluster analysis, and analysis of variance, is one method of triangulation for examining whether the theoretical orientation is sound (Denzin, 1978).

Prior to conducting any of the analyses, all variables were screened for normality. All variables produced skewed data, which is a consequence of the highly varied size and structure of rural communities in Australia. They range from urban towns to small isolated communities. They also range from being culturally and socially homogenous to displaying a largely ethnic population. One case, the Unincorporated Far West was found to be a consistent outlier. This area is sparsely populated thus creating extremes amongst most of the variables. Since this area was considered unlikely to contribute greatly to the understanding of crime in rural areas, this case was deleted from the analysis. To correct for skewness in the data, logarithmic transformations were successfully performed with ten variables, namely the four types of crime rates and the census variables of median individual and household income, population, proportion of persons divorced, unemployed and those with a different address since the previous Census. The remaining variables proved unsuitable for transformation and therefore a few extremes within the variables were reduced in value to bring the variables closer to normality (Tabachnick & Fidell, 1989). This left an analysable sample of 122 LGAs. No cases had missing data. All variables were then transformed to z-scores to equate the variables in the measurement scales.

A standard regression was conducted with the identification number for the LGAs as a dummy dependent variable and the census variables as predictors to test for normality, multicollinearity, homoscedasticity, and linearity between residuals. Inspection of the intercorrelations between variables and calculations of variance inflation factors revealed no evidence of multicollinearity within the data. Inspection of the standardised residuals histogram and the standardised scatter plot of predicted scores against residual scores revealed the presence of multivariate outliers and slight deviation in linearity between variables. However, the majority of variables were fairly evenly centred around zero. Three regression computations required removing one extreme multivariate outlier leaving a sample size of 121 for these analyses. Removal of further multivariate outliers only produced more outliers. It was decided to retain all remaining outliers because Tabachnick and Fidell (1989) point out that with a large sample size, the standard error is reduced accordingly.

Results

Four individual standard multiple regressions were performed to investigate those variables that were predictive of higher rates of crime. The dependent variables for the regressions were the rate of assault, break and enter, motor vehicle theft and malicious damage. The proportions of variance explained ranged from approximately 20% to 45%, and are similar to the analyses performed by Rephann (1999) on 1995 rural US data.

Assault

The reduction in variance due to the full model was significantly different than zero (R^2=0.537, F(19,101)=6.15, p<0.0001). The adjusted R^2 was 0.449. Therefore 45% of the variance in the rate of assault across rural New South Wales can be predicted by these variables. Three of the variables, proportion of Indigenous people in the population, proportion of persons living in their own home, and the average growth of communities contributed significantly to the prediction of assault scores. Together they uniquely contributed 9% of the variance in the rate of assault while controlling for the effects of all other variables. Table 1 displays those significant factors, the semi-partial correlations (SR^2) and the significant statistic. These results indicate that higher rates of assault occurred in communities with proportionately more Indigenous people, fewer people living in their own homes, and lower average growth.

---**(Insert Table 1)**---

Break and Enter

The reduction in the variance of break and enter from the full model was significantly different than zero (R^2=0.459, F(19,101)=4.51, p<0.0001). Adjusted $R^2$was 0.358. Table 2 indicates that three variables contributed significantly to the prediction of break and enter scores, explaining about 13% of the variance in the full model. The proportion of sole parents was of borderline significance but is also reported.

---**(Insert Table 2 here)**---

These findings suggest those communities with higher proportions of Indigenous people, more in-migrants, and fewer people living in their own homes were associated with higher rates of break and enter offences. The results are similar to those for assault crimes. Low levels of home ownership and more people moving into an area

combined with low or negative growth in a community may be indicative of less community affiliation and higher rates of both in and out migration. They show that proportionately low commitment and investment in the community were associated with breaking and entering. Rural and remote communities with a high proportion of Indigenous people were also centres for large agricultural industries such as the cotton industry, which require large numbers of seasonal labourers. The higher crime rate in such centres can be viewed as a consequence of the higher degree of social disorganisation and instability. More sole parents imply more family disruption. These factors may be seen as leading to higher rates of break and enter and assault crimes.

Motor Vehicle Theft

Although 29% of the variance in the rate of motor vehicle theft across rural New South Wales was explained by the independent variables, no specific variable contributed significantly to the prediction of motor vehicle theft scores. However, the reduction in variance was still significantly different than zero (R^2=0.397, F(19,102)=3.54, p<0.0001). The relationship between these variables and motor vehicle theft will be explored further in the cluster analysis.

Malicious Damage Offences

The adjusted R^2 for malicious damage offences was 0.299, indicating that 30% of the variance across rural New South Wales can be predicted by the various independent variables. The reduction in variance from the full model was significantly different than zero (R^2=0.41, F(19,101)=3.695, p=0.0001). Two of the variables (persons with a different address since the previous census and average growth) contributed significantly to the prediction of malicious damage scores. Another, the proportion of persons married, was of borderline significance. These variables uniquely contributed 8% of the variance in the rate of malicious damage. Table 3 displays the results.

---**(Insert Table 3 here)**---

These findings indicate that a high proportion of people moving into a community, yet with an overall lower rate of growth, was associated with higher rates of malicious damage offences. This suggests that many people are moving in and few are staying. A high transient population will have less 'sense of place' or emotional attachment to their locale. Vandalism therefore, may be symptomatic of high levels of social disruption caused by high residential mobility combined with less family stability, which can lead to feelings of alienation among some residents.

Summary of Regression Analyses

The regression analyses identified several prediction factors, which consistently explain variations in crime rates across rural LGAs. Those LGAs with residential instability, as indicated by the growth rate of a community or more people moving into an area and fewer persons living in their own home, all suggesting less community affiliation and high mobility, were associated with more crime. Family instability, indicated by a low proportion of married people and more sole parents, was also associated with higher crime rates. In terms of social disorganisation theory, this suggests that the stability that a marriage partnership provides and the presence of two parents in a family were important in providing stability within a home and the wider community. A high proportion of Indigenous people in a population was associated with higher rates of assault and break and enter crimes. This suggests that communities with a diverse ethnic base experience more social disorganisation and thus more crime. However, the effect of high mobility and family breakdown qualifies this finding. The dynamics amongst all these factors contribute to high rates of crime. Note that no economic measures were significantly associated with any of these crimes within the multivariate framework of regression analyses. However, economic conditions can be associated with social disorganisation, and this can be examined in the cluster analysis.

Cluster Analysis

While often performed as an inductive and a theoretical statistical procedure, cluster analyses also contribute a deductive and hypothesis-testing component to the analyses (Kaufman & Rousseeuw, 1990; Hair, *et al*., 1999). Since levels of social disorganisation were posited to be associated with crime, emerging clusters provide an empirical test of those hypotheses.

A hierarchal cluster analysis was performed to group LGAs based upon the similarities and differences they display, from the 1996 Census measures of their population, social, and economic characteristics. Ward's minimum variance cluster analysis was employed with dissimilarities between LGAs defined by squared Euclidean distance (Aldenderfer & Blashfield, 1984). Inspection of the dendrogram (a hierarchal procedure that displays a tree graph in which each object is graphically clustered with a similar object) and scree plot (Figure 1) resulting from the clustering procedure suggested the presence of 6 clusters. The scree plot is formed by plotting the reduction in the residual sum of squares at each partitioning of the data. The residual sum of squares is a measure of the degree of dissimilarity between the LGAs in each cluster (Figure 1), summed across all the clusters (Aldenderfer & Blashfield, 1984; Hair *et al*., 1999). A substantial decrease in the residual sum of squares at a partition suggests

that, before the partition, two relatively dissimilar clusters had been combined into one, larger cluster. As Figure 1 indicates, reductions in the sum of squares were minor after the seventh cluster, and substantial between the sixth and seventh clusters. From this, we inductively arrived at six clusters, which are described statistically in Table 4. The reader should be cautioned that on any single characteristic, clusters would appear similar.

---**(Insert figure 1 here)**---

The Clusters

The clustering procedure identified groups of communities with similar geographical locations. Labels were applied to each cluster according to their most salient features. The clustering inductively substantiates that different social structures exist across geographic areas. These clusters also differentiate the distribution of crime.

The following description of the clusters provides a profile of the six types of communities drawing on those variables used in the cluster analysis (as well as some additional census variables), which were analysed post hoc according to the cluster solution. Table 4 shows a statistical description for each cluster and figure 2 displays the geographical location of the clusters. A list of the names of the communities assigned to each cluster is presented in appendix 1. The scores on some variables are the same for two or more clusters; however, it is the over-all combination of characteristics that statistically defined the clusters described below.

---**(Insert table 4 and figure 2 here)**---

- **Cluster one: Large Urban Centres (N=10, 8% of the sample)**

  These LGAs were regional centres with an average population of 33,251. There were more females than males, an overall young age, and a higher rate of people moving into the area but only a slightly above average growth rate. These locations had a higher level of education among the residents, less unemployment, and higher average income. There are average numbers of people living in their own home, but fewer couple families and more sole parents. There were fewer people married and a higher rate of separation and divorce. There were higher proportions of Indigenous people and of people born overseas.

- **Cluster two: Coastal Communities (N=17, 13% of the sample)**

  Most of the LGAs in this cluster were located along the coast. Their mean population size was 27,925, slightly less than Cluster one. Like the first cluster, there were slightly more females than males, however, unlike the first cluster, there was an above-average median age reflecting the large numbers of retirees in coastal regions. Average growth for these communities was the highest of all clusters and there were greater numbers of in-migrants. There were higher proportions of skilled workers, average numbers of persons with tertiary and basic qualifications, and higher proportions of people who left school under 14 or 15 years. Unemployment was the highest of all the clusters with a corresponding lower average income. There were high numbers of people resident in mobile homes and fewer people living in their own homes. The proportions of separated and divorced people were higher. Consequently, the proportions of sole parents were higher, and of married couples, lower. Unlike the first cluster, there were average proportions of Indigenous people but higher proportions of people born overseas.

- **Cluster three: Satellite Communities (N=13, 11% of the sample)**

  This cluster consisted of communities that lie close to a major metropolitan area (>50,000). The average population was 8,484, much lower than the first two clusters. These communities had above average growth rates and the highest proportion of in-migrants among the six clusters. The median age was below average with more young women but more men in the 30 years and above age groups. The residents in this group had the highest level of tertiary qualifications and above average vocational skills and basic skills. Accordingly, this cluster had the highest median individual and household incomes. Fewer people left school under the ages of 14, 15, or 16 years in these locales. Unemployment in these communities was the lowest across all clusters. Family stability was evident with fewer sole parents, more couple families, more people married, an average proportion of people who were separated and fewer who were divorced. More of the residents lived in their own homes and fewer in mobile homes. There were proportionately fewer Indigenous people but more people born overseas.

- **Cluster four: Medium Stable Communities (N=23, 19% of the sample)**

  These communities had an average population of 11,046. They had above average growth but only average proportions of people moving into the area. These communities also had higher proportions of males across all ages. There were average proportions of tertiary qualified and basic skilled persons with

above average numbers of people with skilled vocations. These communities contained fewer people who left school under the age of 14 but more who left school under age 15 or 16. Unemployment was quite low and the median individual and household incomes were high in comparison to other clusters. The median age was also quite low. There were more couple families and average numbers of sole parents, and persons who were married, divorced or separated. A greater proportion of the residents live in their own home and average numbers of people live in mobile homes. These communities had slightly below average proportions of Indigenous people and slightly above average proportions of people born overseas. This cluster had the highest number of persons employed in the mining industry. The effects of stable, well-paid employment undoubtedly contributed to many of the characteristics of these communities.

- **Cluster five: Medium Declining Communities (N=29, 24% of the sample)**

These LGAs had a population size averaging 8,115, similar to the third cluster, and had the highest negative growth rate among the six clusters. Few people were moving into these areas. These communities had a higher proportion of males in the 40 to 49 age ranges but slightly more females in the other age groups. The median age was slightly below average. Education levels were also lower with average proportions of people who left school under 14, 15 or 16 years. The unemployment rate was slightly above average while the median individual and household incomes were low. The proportion of sole parents was above average; there were fewer couple families and married persons but average rates of separation and less divorce. The numbers of people living in mobile homes was average and there were slightly more people living in their own homes. These communities had the highest proportion of Indigenous people and the lowest proportion of persons born overseas.

- **Cluster six: Small Farming Communities (N=31, 25% of the sample)**

This group had the lowest average population of the six clusters (3,982), and had the highest rate of agricultural industry. Typical of small agricultural communities, there were higher proportions of males across all age groups, and an above average median age. There was a negative growth rate with fewer in-migrants. There were fewer people with tertiary or vocational skills but average numbers of people with basic skills. The proportions of those leaving school under 14, 15 or 16 years were very high. Correspondingly, the income levels were the lowest across all clusters. Nevertheless, unemployment was below average. There were more couple families and married people, and more people living in their own

homes and, correspondingly, less family breakdown. These communities had slightly below average proportions of Indigenous people and people born overseas.

Examination of the Clusters and Crime

A *post hoc* one-way multivariate analysis of variance was conducted to internally validate the six-cluster solution and compare them across the four types of crime. A significant multivariate difference was found amongst the clusters (Wilks Λ =0.48163, approx. F(25,418)=3.63, p<0.0001). The multivariate effect size was 0.136. Therefore 14% of the variance between the clusters can be explained by the difference in crime types. *Post hoc* univariate F-tests revealed significant differences between the clusters for assault (F(5,116)=4.99, p<0.0001, η^2=0.177), break and enter (F(5,116)=8.96, p<0.0001, η^2=0.279), motor vehicle theft (F(5,116)=6.386, p<0.0001, η^2=0.216) and malicious damage (F(5,116)=5.32, p<0.0001, η^2=0.187. Figure 3 graphically displays the mean standardised score profiles for each of the six clusters. Clusters are arranged along an urbanity continuum by population size with one exception. The satellite cluster is in the third position because its proximity to cities makes it arguably more urbane.

---**(Insert figure 3 here)**---

Medium declining communities were found to have significantly higher rates of assault than small farming communities, medium stable communities and satellite communities. For break and enter, large urban centres, coastal communities, medium stable communities and medium declining communities experienced significantly more offences than small farming communities. For motor vehicle theft, large urban centres, coastal communities and medium declining communities exhibited more crime than small farming communities. Although not evident in the regression analysis, the trend in these results suggests that larger communities, which experience more instability due to family breakdown and in and out migration, experience more motor vehicle theft. Large urban centres, medium declining communities and satellite communities experienced significantly more malicious damage than small farming communities. The largest cluster had significantly more motor vehicle theft, break and enter and malicious damage than at least one cluster of smaller communities. The second largest cluster followed close behind. Satellite communities did not fit clearly along the continuum by size. They were anomalies because satellite LGAs resemble prosperous urban suburbs despite their rural location. They had wide variation in crimes. Their assaults and vehicle thefts were below average while malicious damage was above average. They were unlike other clusters with high variation in crime, namely the first and fifth clusters that had very high overall crime.

The results of the clustering procedure indicate that underlying social structures were associated with crime. Two especially important variations in crime patterns among the clusters were demonstrated. First, the larger the LGA, generally, the higher the crime. This finding corresponds to previous research that found urban levels of crime to exceed rural levels (Sampson, 1986; Tittle, 1989; Ingram, 1993; Rephann, 1999). It supports classical notions (Wirth, 1938) that the larger, denser, and more heterogeneous populations had more crime because they had less social integration and cohesion. The measures that emerged to create the clusters further validate that notion. Higher crime clusters were more heterogeneous and had greater extremes, such as more early school-dropouts and higher educational skills. Despite being relatively wealthier, larger areas generally had higher levels of migration, more residents who were ethnic minorities, divorced or separated, and single parents.

Second, medium-declining communities (cluster 5) had crime patterns that were completely out of synchrony with the urban-rural continuum. Despite the small size and relative remoteness of communities in cluster five, their crime rates equalled or exceeded those of the largest urban centres. This apparent irregularity occurred because cluster five communities were especially disorganised in comparison to other clusters (Wilkinson, 1984b). They are rural counterparts of the extreme concentration of disadvantage that Wilson (1987) and others (Krivo & Peterson, 1996) have identified as the source of crime in truly disadvantaged urban areas. They were consistently disadvantaged in their levels of education, employment, and income. They had proportionately more of a severely disadvantaged Indigenous population, of sole parents and of divorced and separated people. Like the other small community clusters, more people owned homes. Unlike the others, however, mobile homes also were more common. The findings support the hypothesis that greater social disorganisation was associated with more crime. Medium stable communities (cluster 4) and small farming communities (cluster 6) clearly comprise the most organised and safest communities. Conversely, the less organised medium declining communities (cluster 5), urban centres (cluster 1), and coastal communities (cluster 2) sequentially experienced greater levels of crime. These findings strongly support a social disorganisation orientation.

Summary and Conclusion

Social disorganisation theory provides a useful framework for examining the ecology of rural crime. The foregoing analyses clearly identify crucial factors that were associated with crime, and the locations in which those factors are present. Association, of course, does not imply causation. The most important general finding was that crime is related to social structures that vary across identifiable types of geographic locations. To speak of rural versus urban crime is insufficient. The existence of intra-rural variations in crime is itself a complex phenomenon that

merits complex analyses and explanations. The two areas with highest crime included, ironically, the largest (cluster 1) and nearly the smallest (cluster 5) in the sample. This finding indicates the enormous diversity in the relationship between the factors included in this analysis and crime. It dispels the notion that all small communities have less crime than larger urban centres. The additional finding that medium stable communities (cluster 4) and small farming communities (cluster 6) have the lowest crime rates indicates that small town size was important and was complemented by factors creating cohesion and integration in those locations. For example, the dynamics of poverty and population loss found by Barnett and Mencken (2002) for US counties applies to cluster 5. The LGA's in the fifth cluster had higher unemployment, lower median family income, and population loss. So did the sixth cluster, which exhibited the lowest crime rates. However, these factors were offset in cluster 6 LGA's by higher rates of couple families, married people and people living in their own homes, and lower proportion of people living in mobile homes, persons born overseas and Indigenous people.

Measures of social factors (i.e., population heterogeneity, population movement, family instability) accounted for much more crime than did economic measures. Economic measures may be a dark figure responsible for some community characteristics that in turn predispose crime. For example, the high unemployment of Australia may lead some people to be migratory. However, the places where they were most likely to move may (clusters 1 and 2), or may not (cluster 3), have higher crime. Poor economic conditions exist in small farming communities (cluster 6), which had the lowest crime. However, coastal communities (cluster 2) and medium declining communities (cluster 5) suffer from the 'double whammy' of high social disorganisation and high economic disadvantage, as reflected by their high levels of crime.

A notable finding was that rates of assault in medium declining communities (cluster 5) were significantly higher than in the other clusters composed of small communities (clusters 3, 4, and 6). This means that rural places, *per se*, did not have high assault. Rather, assaults were concentrated in the small number of highly disorganised rural communities. The findings further indicate that the four measures of crime are operating somewhat, but not entirely, independently of each other, a finding also supported by Rephann's analysis (1999) from the US. This is important because the types of crimes are more than just measures of particular violations. Each crime may be a marker of causal factors that led to its commission. While the overall crime rates for some clusters are similar, the frequencies with which particular crimes are committed are very different. For example, the overall crimes in large urban centres and in medium declining communities are both high, but those averages mask the differences in frequencies of particular types of crime. Medium declining communities have comparatively (and absolutely) high assault while large urban centres have comparatively high motor vehicle theft.

Quantitative, multivariate analyses of crime rates can lead to a clearer understanding of trends associated with crime, a fact long known by researchers who employ various forms of regression analyses in order to sort out the relative contributions of single factors while controlling for the effects of other influences on crime. In addition, cluster analysis is a useful complement to other multivariate techniques because of its ability to inductively and statistically identify distinctive types of communities that can exhibit different crime profiles. In addition, cluster analysis provides the researcher a way to compare and contrast results with the regression analysis. In this particular investigation, the results from both analyses were in agreement, that is, that social disorganisation theory is useful for examining variations in crime rates across different kinds of rural communities. The results confirm and expand on the results of previous and current research about rural crime (Fisher, 1980; Laub, 1983; Wilkinson, 1984a and 1984b; Tittle, 1989; Freudenberg & Jones, 1991; Ingram, 1993; Kowalski & Duffield, 1990; Rephann, 1999; Osgood & Chambers, 2000; Carcach, 2001). Further, the findings complement and add to the previous work on rural crime in Australia by O'Connor and Gray (1989), Cunneen (1990), Devery (1991), Hogg and Carrington (1998) and Carcach (2001). Altogether, this examination and previous research leads to two distinct conclusions with reference to rural communities: (1) size still counts, that is, smaller rural places tend to have lower rates than larger rural places; but (2) the effect of size is clearly modified by other factors, especially population heterogeneity, and family instability, all of which support the tenets of social disorganisation theory.

There are clear limitations to this study. One was the high variance in the data, which was adjusted for by various data transformation techniques described in the methodology. However, this variance points toward one recommendation for future research, which is a continual need for conducting qualitative case studies of individual communities in order to gain a deeper understanding of the dynamics of crime and demographic, economic and social characteristics within a community.

Second, statistical analyses of rural community characteristics and crime rates should be extended beyond the boundaries of New South Wales. Further, additional studies of this type should be conducted in other countries, such as Canada, Great Britain, and the US, among others. Similar research in these three countries would be comparable because each possesses advanced economies and societies, and like Australia, are mostly urban yet contain large and diverse rural populations and communities. A second advantage is that these four countries collect crime statistics in similar ways. However, there are still variations in the organisation of policing and the application of laws by the police between these countries that will inevitably introduce error in measurement.

Third, a larger sample within the same country, plus cross-country analyses, can lead to more sophisticated and in-depth multivariate examination of crime in rural communities. For example, the finding from the regression

analysis that social factors, not economic factors, were significant predictors of crime needs more exploration. A path analytic model might prove useful for sorting out both direct and indirect influences of various factors. It is possible that economic factors, such as high unemployment and poverty, by putting additional strain on families and eroding the infrastructure of local services and the ability of local civic and social groups to function, are important but indirect contributors to social disorganisation. It is equally possible that certain demographic, economic and social factors interact to create unique conditions for the structural disorganisation of particular rural communities.

---Insert appendix 1 here ---

NOTES:

[1] Indigenous people include Aboriginal people and Torres Strait Islanders.

[2] Statistical Local Areas (SLAs) closely resemble Local Government Areas (LGAs) (Australian Bureau of Statistics, 1997).

References

Aldenderfer, M.S., & Blashfield, R.K. (1984). *Cluster Analysis*. Sage University Paper Series, Quantitative Applications in the Social Sciences, Series no. 07-044, Beverley Hills and London: Sage Publications.

Australian Bureau of Statistics. (1997). *1996 Census of Population and Housing*. Australian Bureau of Statistics, Canberra.

Bachman, R.I. (1992). Crime in Non-metropolitan America: A National Accounting of Trends, Incidence Rates and Idiosyncratic Vulnerabilities, *Rural Sociology*, 57(4): 546-560.

Bandura, A. (1973). *Aggression: A Social Learning Approach.* Englewood Cliffs, NJ: Prentice-Hall.

Barnett, C. and Mencken, F. C. (2002). Social Disorganization Theory and the Contextual Nature of Crime in Nonmetropolitan Counties. *Rural Sociology* 67 (3): 372-393.

Becker, G. (1968). Crime and Punishment: An Economic Approach, *Journal of Political Economy*, 76(2): 169-217.

Bellair, P. E. (1997). 'Social Interaction and Community Crime: Examining the Importance of Neighborhood Networks', *Criminology*, 35, 4, 677.

Beirne, P., & Messerschmidt, J. (1995). *Criminology*. Fort Worth, TX: Harcourt Brace.

Blumstein, A., Cohen, J., Roth, J.A., & Visher, C.A. (1986). *Criminal Careers and 'Career Criminals'*. Washington DC: National Academy Press.

Burgess, R.L., & Akers, R.L. (1966). A Differential Association—Reinforcement Theory of Criminal Behavior, *Social Problems*, 14(2): 128-147.

Bursick, R.J. Jr. (1986). Ecological Stability and the Dynamics of Delinquency. In A.J. Reiss & M. Tonry (Eds.), *Communities and Crime* (pp. 79-103). Chicago, IL: University of Chicago Press.

Bursick, R.J. Jr. & Gransmick, H.G. (1999). *Neighborhoods and crime: The dimensions of effective community control.* New York: Lexington Books.

Carcach, C. (2001). Regional Variation in Crime. Atlanta, Georgia: Paper presented at the annual meeting of the American Criminological Society. November.

Carter, T.J., Phillips, H.G., Donnermeyer, J.F., & Wurschmidt, T.N. (Eds.). (1982). *Rural Crime: Integrating Research Prevention.* Totowa, NJ: Allanheld, Osmun.

Clinard, M.B. (1944). Rural Criminal Offenders, *American Journal of Sociology*, 50(1): 38-45.

Cohen, A.K. (1955). *Delinquent Boys: The Culture of the Gang.* New York, NY: Free Press.

Cook, T.D., & Campbell, D.T. (1979). *Quasi-Experimental Design and Analysis: Issues for Field Settings.* Chicago, IL: Rand-McNally.

Cunneen, C. (1990). Aborigines and Law and Order Regimes, *Journal for Social Justice Studies, Special Edition on Contemporary Race Relations*, 3(1): 37-50.

Denzin, N.K. (1978). *The Research Act: A Theoretical Introduction to Theory and Methods Second Edition*. New York, NY: McGraw-Hill.

Devery, C. (1991). *Disadvantage and Crime in New South Wales.* Sydney: New South Wales Bureau of Crime Statistics and Research.

Dewey, R. (1960). The Rural-Urban Continuum: Real but Relatively Unimportant, *American Journal of Sociology,* 66(1): 60-66.

Donnermeyer, J.F., & Jobes, P.C. (2000). Rural Crime. *Encyclopaedia of Criminology and Deviant Behavior*, 461-464. London: Taylor & Francis.

Durkheim, E. (1933). *On the Division of Labor in Society* (G. Simpson Trans.). New York, NY: Macmillan.

Edwards, R. W., & Donnermeyer, J.F. (2002). Introduction to Special Issue: Substance Use in Rural Communities Around the World. *Substance Use and Misuse*, 37(5): vii-xii.

Fischer, C.S. (1980). The Spread of Violent Crime from City to Countryside, 1955 to 1975, *Rural Sociology*, 4(4): 416-434.

Freudenberg, W.R. (1986). The Density of Acquaintanceship: An Overlooked Variable in Community Research, *American Journal of Sociology*, 92: 27-63.

Freudenberg, W.R., & Jones, R.E. (1991). Criminal Behavior and Rapid Community Growth: Examining the Evidence. *Rural Sociology*, 56: 619-645.

Fuguitt, G.V., & Beale, C.L. (1996). Recent Trends in Non-metropolitan Migration: Toward a New Turnaround, *Growth and Change*, 27(1): 156-174.

Gardner, L., & Shoemaker, D.J. (1989). Social Bonding and Delinquency: A Comparative Analysis, *Sociological Quarterly*, 30: 481-500.

Gusfield, J.R. (1963). *Symbolic Crusade*. Urbana, IL: University of Illinois Press.

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1999). *Multivariate Data Analysis: with Readings (5th edition.* New Jersey, NJ: Prentice-Hall.

Hakim, S., Ovadia, A., & Weinblatt, J. (1978). Crime, Attraction and Deterrence in Small Communities, *International Regional Science Review*, 3: 153-163.

Harding, R., Morgan, F., Ferrante, A., Loh, N., & Fernandez, J. (1997). *Rural Crime and Safety in Western Australia.* Crime Research Centre Report for the Western Australia Regional Development Council, Department of Commerce and Trade, Perth: Government of Western Australia.

Hawley, A.H. (1986). *Human Ecology: A Theoretical Essay*. Chicago, IL: University of Chicago.

Heitgerd, J.L., & Bursik, R.J., Jr. (1987). Extra community dynamics and the ecology of delinquency. *American Journal of Sociology*, 92: 775-787.

Hillery, G.A. (1955). Definitions of Community: Areas of Agreement, *Rural Sociology*, 20(1): 111-123.

Hirschi, T. (1969). *Causes of Delinquency.* Berkeley, CA: University of California Press.

Hogg, R., & Carrington, K. (1998). Crime, Rurality and Community, *The Australian and New Zealand Journal of Criminology*, 31(2): 160-181.

Ingram, A.L. (1993). Type of Place, Urbanism, and Delinquency: Further Testing the Determinist Theory. *Journal of Research on Crime and Delinquency*, 30: 192-212.

Jensen, G.E., Stauss, J.H., & Harris, W.V. (1977). Crime Delinquency and the American Indian, *Human Organization*, 36(2): 252-257.

Jobes, P.C. (1987). The Disintegration of *Gemeinschaft* Social Structure from Energy Development: Observations from Ranch Communities in the Western United States, *Rural Studies*, 3(3): 219-229.

Jobes, P.C. (2002) "Human Ecology and Rural Policing: A Grounded Theoretical Analysis of How Personal Constraints and Community Characteristics Influence Strategies of Law Enforcement in Rural New South Wales, Australia", *Police Practice and Research: An International Journal*, 4, 1,

Kaufman, L., & Rousseeuw, P.J. (1990). *Finding Groups in Data: An Introduction to Cluster Analysis.* New York, NY: John Wiley and Sons.

Kitsuse, J.I., & Spector, M. (1973). The Definition of Social Problems, *Social Problems*, 20(4): 407-419.

Kowalski, G.S., & Duffield, D. (1990). The Impact of the Rural Population Component on Homicide Rates in the United States: A County-Level Analysis, *Rural Sociology*, 54(1): 76-90.

Krivo, L.J., & Peterson, R.D. (1996). Extremely Disadvantaged Neighborhoods and Urban Crime, *Social Forces*, 75(2): 619-644.

Laub, J. H. (1983). Patterns of Offending in Urban and Rural Areas, *Journal of Criminal Justice*, 11, 129-142.

McDonald, T.D., Wood, R.A., & Phlug, M.A. (1996). *Rural Criminal Justice*. Salem, WI: Sheffield Publishing.

Merton, R.K. (1938). Social Structure and Anomie, *American Sociological Review*, 3(3): 672-682.

New South Wales Bureau of Crime Statistics and Research (BOCSAR) (1997). *NSW Recorded Crime Statistics LGA Supplementary Tables Country East and Country West Statistical Divisions 1996*, New South Wales Bureau of Crime Statistics and Research: Sydney.

O'Connor, M., & Gray, D. (1989). *Crime in a Rural Community*. Sydney: Federation.

Osgood, D.W., & Chambers, J.M. (2000). Social Disorganization Outside the Metropolis: An Analysis of Rural Youth Violence. *Criminology*, 38: 81-115.

Parsons, T. (1961). An Outline of the Social System. In T. Parsons, E. Shils, K.D. Naegele & J. Pitts (Eds.), *Theories of Society* (pp. 36-40). Glencoe, IL: The Free Press.

Quinney, R. (1970). *The Social Reality of Crime*. Boston, MASS: Little, Brown.

Rephann, T. (1999). Links between Rural Development and Crime, *Papers in Regional Science*, 78(4) pp. 365-386.

Robinson, W.S. (1950). Ecological Correlations and the Behavior of Individuals, *American Sociological Review*, 15(3): 351-357.

Salamon, S. (1997). Culture. In G.A. Goreham (Ed.), *Encyclopaedia of Rural America: The Land and People, Volume I* (pp.169-172). Santa Barbara, CA: ABC-CLIO.

Sampson, R.J. (1985). Neighborhood and Crime: The Structural Determinants of Personal Victimization, *Journal of Research in Crime and Delinquency*, 22(1): 7-40.

Sampson, R.J. (1986). The Effects of Urbanization and Neighborhood Characteristics on Criminal Victimization. In R.M. Figlio, S. Hakim & G. Rengert (Eds.), *Metropolitan Crime Patterns* (pp. 3-25). Monsey, NY: Willow Tree Press.

Sampson, R.J., & Groves, W.B. (1989). Community Structure and Crime: Testing Social-Disorganization Theory. *American Journal of Sociology*, 94: 774-802.

Sampson, R.J., Raudenbush, S.W., & Earls, F. (1997). Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy, *Science*, 277, 918-924.

Schwirian, K.P. (1973). Some Analytical Problems in the Comparative Test of Ecological Theories. In M. Armer & A.D. Grimshaw (Eds.), *Comparative Social Researc*h (pp. 74-102). New York, NY: John Wiley and Sons.

Sellin, T. (1938). *Culture Conflict and Crime*. New York, NY: Social Science Research Council.

Short, J.F. (1998). The level of explanation problem revisited—The American Society of Criminology 1997 presidential address, *Criminology*, 36(1): 3-36.

Smith, W.R., Frazee, S.G., & Davison, E.L. (2000). Furthering the Integration of Routine Activity and Social Disorganization Theories: Small Units of Analysis and the Study of Street Robbery as a Diffusion Process. *Criminology*, 38: 489-523.

Summers, G. (1991). Minorities in Rural Society, *Rural Sociology*, 56(2): 177-188.

Sutherland, E.H. (1942). *Criminology*. Philadelphia, PA: J.B. Lippincott.

Tabachnick, B.D., & L.S. Fidell, (1989). *Using Multivariate Statistics (2nd edition).* New York, NY: Harper Collins.

Thurman, Q.C., & McGarrell, E.F. (1997). *Community Policing in a Rural Setting*. Cincinnati, OH: Anderson Publishing.

Tittle, C.R. (1989). Influences on Urbanism: A Test of Predictions from Three Theories. *Social Problems*, 36: 270-288.

Tittle, C.R. (2000). Theoretical Developments in Criminology. Pp. 51 - 101 in G. LaFree, J.F. Short, R. J. Bursik, Jr. & R. B. Taylor (eds.), *Volume 1: The Nature of Crime: Continuity and Change.* Washington, D.C.: US Department of Justice, Office of Justice Programs.

Toennies, F. (1957). *Community and Society* (C.P. Loomis, Trans.). East Lansing, MI: Michigan State University Press.

Wallerstein, I. (Ed.). (1975). *World Inequality*. Montreal: Black Rose Books.

Wardwell, J.M. (1977). Equilibrium and Change in Non-metropolitan Growth, *Rural Sociology*, 42(1): 89-104.

Weisheit, R.A., & Donnermeyer, J.F. (2000). Change and Continuity in Crime in Rural America. Pp. 309-358 in G. LaFree, J.F. Short, R.J. Bursik, Jr., & R.B. Taylor (eds.), *Volume 1. The Nature of Crime: Continuity and Change.* Washington, DC: US Department of Justice, Office of Justice Programs.

Weisheit, R.A., Falcone, D.N., & Wells, L.E. (1999). *Crime and Policing in Rural and Small-town America (2nd edition).* Prospect Heights, IL: Waveland.

Weisheit, RA., Wells, L.E., & Falcone, D. (1995*). Crime and Policing in Rural and Small-town America: An Overview of the Issues.* Washington DC: National Institute of Justice.

Wilkinson, K.P. (1984a). A Research Note on Homicide and Rurality. *Social Forces*, 63: 445-452.

Wilkinson, K.P. (1984b). Rurality and Patterns of Social Disruption. *Rural Sociology*, 49: 23-36.

Williams, P. (1999). Illicit Drugs: Convergence of Rural and City Trends. Fact or Fiction? Conference *on Crime in Rural Communities: The Impacts, the Causes, the Prevention,* Canberra: Australian Institute of Criminology.

Wilson, W.J. (1987). *The Truly Disadvantaged: The Inner City, the Underclass and Public Policy*. Chicago, IL: University of Chicago.

Wirth, L. (1938). Urbanism as a Way of Life, *American Journal of Sociology*, 40(1): 1-24.

Acknowledgement

The research that forms the subject of this paper has been supported by a grant from the Criminology Research Council, The Australian Institute of Criminology, Canberra, ACT, Australia.

Table 1:
Significant predictors in standard multiple regression of census variables on rate of *assault*.

Census variables	SR^2	t-statistic	
Proportion of Indigenous population	0.048	3.251, p<0.002	R2=0.537 Adjusted R2=0.449 R=0.732, p<0.0001
Proportion of persons living in their own home	0.019	-2.084, p<0.04	
Average growth of communities	0.019	-2.086, p<0.04	

Table 2:
Significant predictors in standard multiple regression of census variables on rate of *break and enter*.

Census variables	SR^2	t-statistic	
Proportion of Indigenous population	0.034	2.507, p=0.01	R2=0.459 Adjusted R2=0.358
Proportion of persons living in their own home	0.053	-3.153, p=0.002	R=0.677, p<0.0001
Persons with different address (different SLA) since the 1991 census	0.022	2.006, p=0.04	
*Proportion of sole parents	0.017	1.814, p=0.07	

Table 3:
Significant predictors in standard multiple regression of census variables on rate of *malicious damage offences*.

Census variables	SR^2	t-statistic	
Persons with different address (different SLA) since the 1991 census	0.031	2.290, p<0.02	R2=0.41 Adjusted R2=0.299 R=0.640, p<0.0001
Average Growth	0.031	-2.290, p<0.02	
*Proportion of persons married	0.02	-1.838, p=0.06	

Table 4

Means and standard deviations for census variables* for the six clusters.

Census variables used in the cluster solution	Cluster 1 Large Urban Centres		Cluster 2 Coastal Communities		Cluster 3 Satellite Communities		Cluster 4 Medium Stable Communities		Cluster 5 Medium Declining Communities		Cluster 6 Small Farming Communities	
	Mean	Standard Dev	Mean	Standard Dev	Mean	Standard Dev	Mean	Standard Dev	Mean	Standard Dev	Mean	Standard Dev
Population*	33251.00	12076.63	27925.38	20637.64	8484.54	9669.33	11045.9	9009.49	8115.48	941.97	3982.45	818.65
Average growth of community*	0.70	0.70	1.98	1.12	0.73	1.17	0.52	0.73	-0.96	0.83	-0.53	0.85
Tertiary qualifications	13.0	1.0	11.0	2.0	14.0	.01	11.0	1.0	10.0	1.0	9.0	1.0
Vocational skills	11.0	1.0	12.0	1.0	12.0	2.0	12.0	1.0	9.0	1.0	9.0	1.0
Basic qualifications	3.0	1.0	3.0	0.01	4.0	0.01	3.0	1.0	3.0	0.01	3.0	1.0
Left school aged 14	11.0	2.0	16.0	2.0	10.0	2.0	13.0	2.0	14.0	2.0	15.0	2.0
Left school aged 15	22.0	2.0	27.0	3.0	21.0	3.0	26.0	2.0	26.0	2.0	25.0	3.0
Left school aged 16	22.0	2.0	22.0	1.0	22.0	2.0	25.0	1.0	23.0	1.0	22.0	2.0
Unemployment rate	9.75	2.03	16.54	2.76	6.60	1.49	8.91	3.41	10.98	2.17	8.72	1.97
Median age*	31.20	2.20	38.63	2.83	34.85	2.54	34.43	2.33	34.93	2.48	37.03	2.37
Median income*	260.00	31.62	223.75	35.00	296.15	77.63	273.04	48.94	243.79	31.89	234.19	29.75
Median household income*	600.00	0.01	400.00	0.01	600.00	115.47	565.22	115.24	455.17	90.97	425.81	68.16
Proportion sole parents	12.0	1.0	11.0	2.0	7.0	2.0	9.0	2.0	11.0	2.0	8.0	1.0
Proportion people in caravans	1.0	1.0	4.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0
Proportion people in own home	75.0	4.0	68.0	4.0	76.0	7.0	78.0	4.0	77.0	3.0	76.0	4.0
Proportion people married	52.0	2.0	57.0	4.0	60.0	4.0	58.0	4.0	56.0	3.0	60.0	3.0
Proportion people separated	4.0	0.0	4.0	1.0	3.0	1.0	3.0	1.0	3.0	0.01	3.0	1.0
Proportion people divorced	6.0	1.0	7.0	0.01	5.0	1.0	6.0	1.0	5.0	1.0	5.0	1.0
Proportion Indigenous people	4.0	1.0	3.0	1.0	1.0	1.0	2.0	1.0	5.0	1.0	2.0	1.0
Proportion people born overseas	8.0	2.0	9.0	2.0	9.0	2.0	7.0	2.0	4.0	1.0	5.0	1.0
Proportion people from different area	21.0	4.0	0.22	3.0	24.0	6.0	19.0	4.0	16.0	2.0	18.0	3.0

Except for population, median age, median income and average growth, all other census variables are percentages of the relevant population.

Figure 1: Partitioning values for clusters.

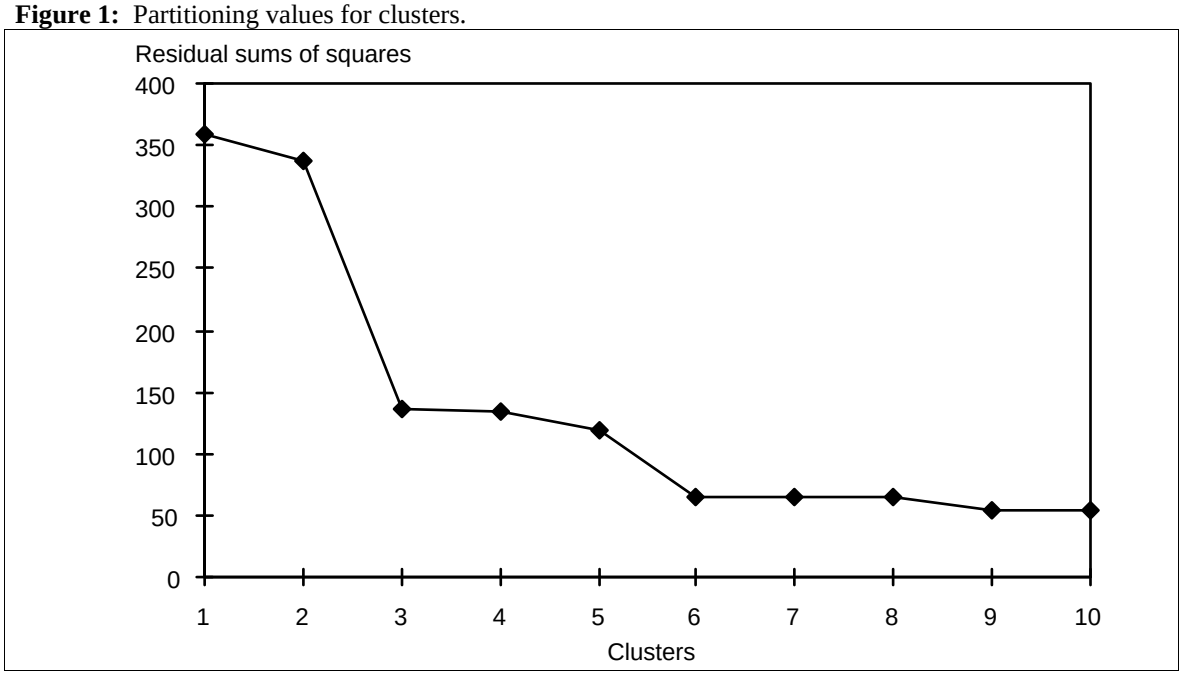


Figure 2:
Map of New South Wales displaying the clusters of social variables.

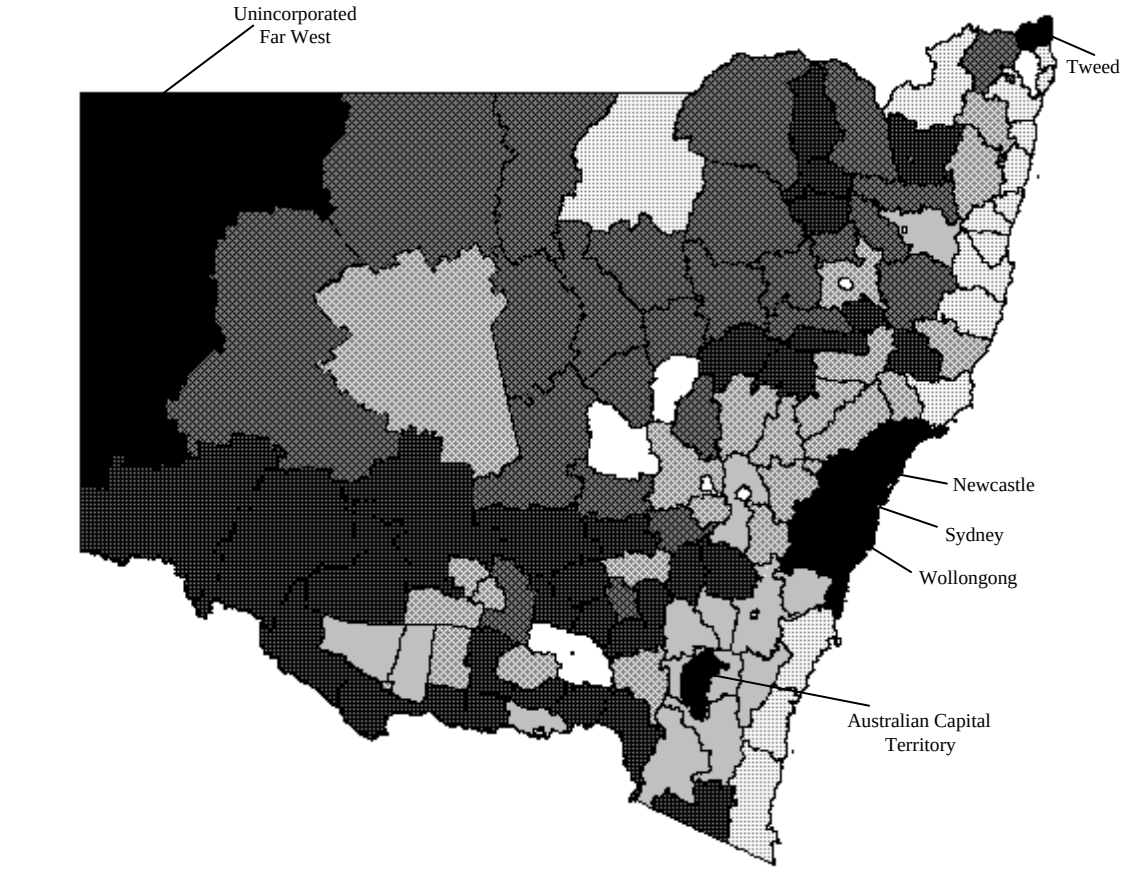
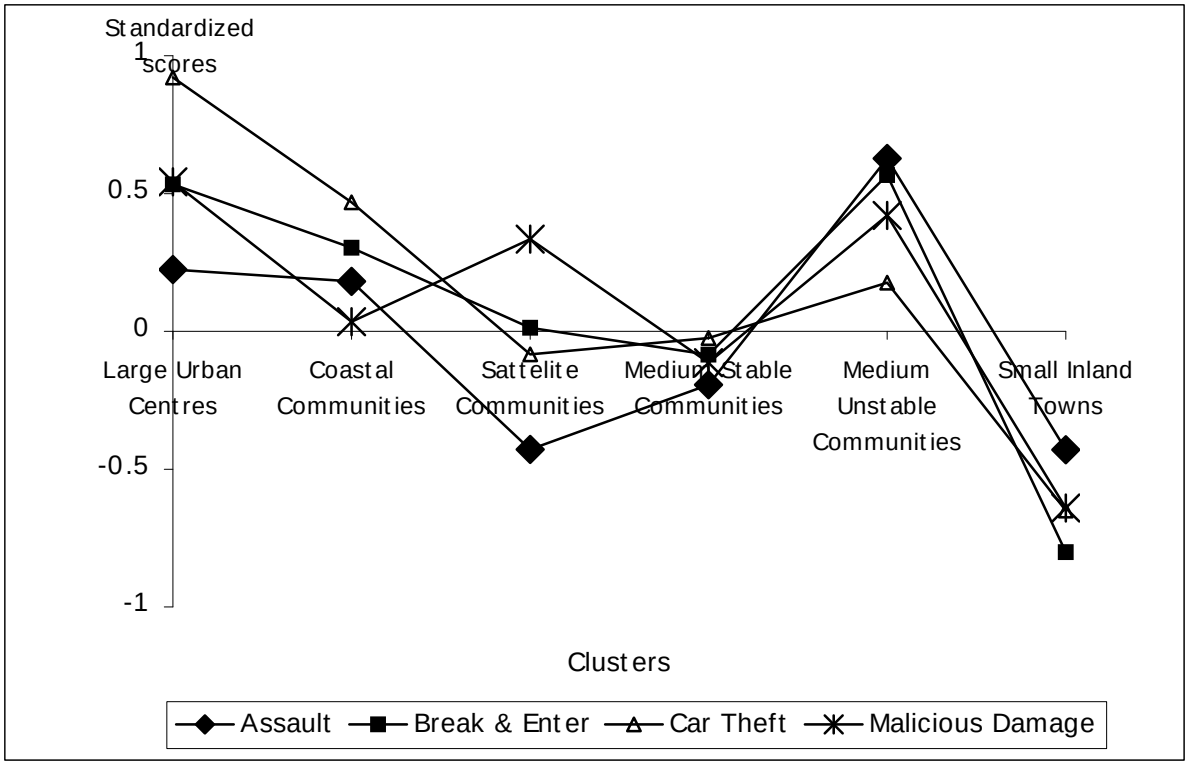


Figure 3: Mean standardised profile scores for the four crime types.



Appendix 1:

Cluster 1 Large Urban Centres	Cluster 2 Coastal Communities	Cluster 3 Satellite Communities	Cluster 4 Medium Stable Communities	Cluster 5 Medium Declining Communities	Cluster 6 Small Farming Communities
Albury	Ballina	Conargo	Blayney	Bogan	Balranald
Armidale	Bega Valley	Cooma	Cabonne	Bourke	Barraba
Bathurst	Bellingen	Dumaresq	Cobar	Brewarrina	Berrigan
Dubbo	Byron Bay	Evans	Copmanhurst	Broken Hill	Bingara
Goulburn	Coffs Harbour	Gunning	Deniliquin	Casino	Bland
Lismore	Eurobodella	Hume	Dungog	Central Darling	Bombala
Orange	Great Lakes	Mulwaree	Griffith	Coonamble	Boorowa
Parkes	Hastings	Snowy	Jerilderie	Coonabarabran	Carrathool
Tamworth	Kempsey	Tallanganda	Leeton	Cootamundra	Coolah
Wagga Wagga	Maclean	Windouran	Lithgow	Cowra	Coolamon
	Nambucca	Wingecarribee	Lockhart	Forbes	Corowa
	Richmond River	Yarralumla	Mudgee	Gilgandra	Crookwell
	Shoalhaven	Yass	Murrumbidgee	Glen Innes	Culcairne
	Tenterfield		Muswellbrook	Grafton	Gloucester
	Ulmarra		Nymboida	Gunnedah	Gundagai
	Walgett		Oberon	Guyra	Harden
			Parry	Inverell	Hay
			Rylestone	Kyogle	Holbrook
			Scone	Lachlan	Junee
			Singleton	Manilla	Merriwa
			Taree	Moree	Murray
			Tumut	Narrabri	Murrurundi
			Young	Narrandera	Nundle
				Narromine	Severn
				Quirindi	Temora
				Uralla	Tumbarumba
				Walcha	Urana
				Warren	Wakool
				Wellington	Weddin
					Wentworth
					Yallaroi