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Mapping Perceptions of Crime in the Comox Valley

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Perceived neighbourhood safety is an important determinant of quality of life. However, consistent with most neighbourhood research, surveys of residents' perceptions of crime tend to ignore the discrepancy between the researcher's definition of neighbourhood (typically an administrative area such as census tract) and residents' perceived neighbourhoods (typically much smaller), which may compromise the reliability of the resultant data. Drawing on surveys conducted in the Comox Valley and in the Netherlands, we show that it is possible to address this discrepancy by using mapping software to establish the size and location of each resident's neighbourhood, and by intentionally contrasting residents' estimates of crime in their own neighbourhoods with estimates for the researcher-defined neighbourhoods. We also show that it is possible to map the hot spots that residents consider unsafe within their communities.

Generating accurate information about neighbourhood crime is important for at least three reasons: researchers can identify the characteristics (known commonly in criminology and sociology as "neighbourhood effects") that discriminate between high and low-crime neighbourhoods; authorities can make informed decisions about allocation of police resources across neighbourhoods; and residents can form judgments about the relative safety of neighbourhoods within their communities.

However, it is quite difficult to generate accurate information on neighbourhood crime. Although official crime reports are relatively objective and take the geographic context of crime into account, they are known to underestimate the incidence of crime in that many crimes

(particularly property crimes, domestic violence and sexual assault) go unreported to the authorities (Mosher, Miethe, and Phillips 85-86). Furthermore, discretion in laying charges can lead to under-recording by police (Mihorean 26). The second conventional approach to measuring crime involves the use of victim surveys, such as those conducted regularly by Statistics Canada as part of the General Social Survey. The strength of these surveys lies in their focus on crime not necessarily reported to the police. However, as with all surveys, they are subject to the vagaries of respondent memory, candour and motivational strategies. Thus, respondents may not recall instances of victimization, may report victimization outside the reference period specified in the survey, and may be reluctant to report victimization involving domestic violence and sexual assault (Mosher, Miethe, and Phillips 167-168). More significantly, large-scale national victim surveys cannot provide reliable estimates of crime at the level of neighbourhood (Maxfield and Babbie 161).

Although it is commonly assumed that biased and sensationalistic media reports can skew the public's perception of the amount and nature of crime in their communities (e.g., Kappeler and Potter 5-9), a small literature indicates that residents' estimates of crime are grounded in reasonable appreciation of the extent of crime in their communities, and therefore represent a meaningful alternative measure of crime in the neighbourhood. Skogan and Maxfield (87-91), for example, calculated the associations between resident perceptions of crime and official crime reports across seventy-six neighbourhoods in Chicago. They reported small but significant positive correlations for assault, robbery and burglary, and concluded that "citizens' assessments of conditions around them can be used as a useful 'stand-in' measure of the incidence of crime, as least as recorded by the police" (p. 88). More recently, Hipp compared resident perceptions of crime with official crime data in six hundred and sixty-one census blocks across twenty-four cities in the U.S., reporting significant positive correlations for motor vehicle theft, burglary and robbery (15).

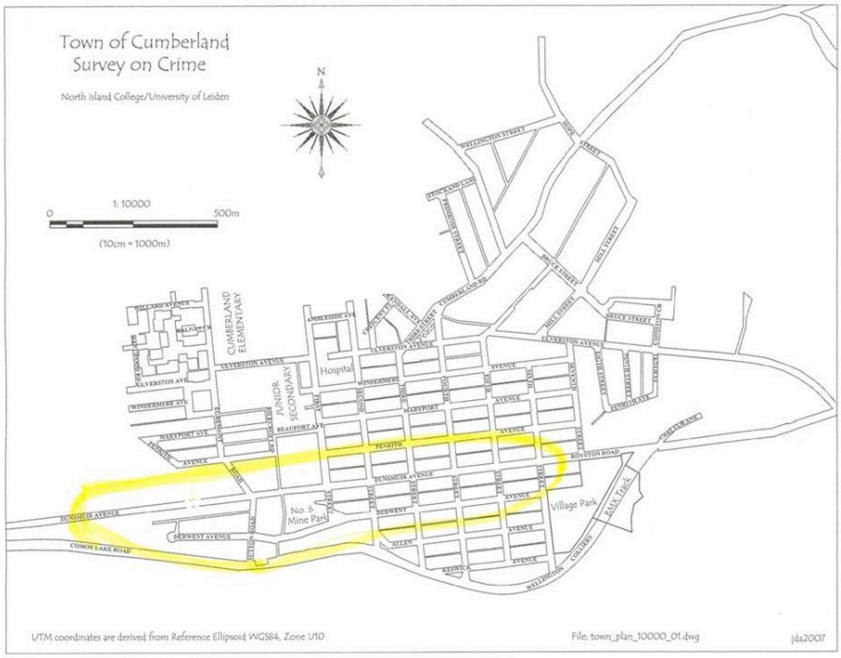
These studies had to deal with the difficult question of how best to define and measure neighbourhood, a notoriously nebulous construct (Nicotera 27-29). Skogan and Maxfield selected large scale community areas as proxies for neighbourhoods, while Hipp adopted the strategy commonly used in the neighbourhood effects literature (Sampson, Morenoff, and Gannon-Rowley 445) of treating neighbourhood as census tract, which range in population size from 1,500 to 8,000 residents in the U.S. and from 2,500 to 8,000 in Canada, with an average in each country of approximately 4,000. Treating census tracts as proxies for neighbourhood is advantageous because of the availability of detailed census data, which facilitates identification of neighbourhood effects and because tracts provide a convenient metric allowing comparison of findings across studies. However, when asked to identify their neighbourhoods on maps of their communities, residents' personal or perceived neighbourhoods rarely overlap with census tracts and in fact are typically much smaller (e.g., Coulton, Corbin, Chan, and Su 376; Kaal and Vanderveen 95). This raises a fundamental question about the interpretation of surveys of residents' perceptions of crime, which habitually leave "neighbourhood" undefined (e.g., "How safe do you feel from crime in your neighborhood?" [Funk, Alan, and Chappell 337]). That is, is it appropriate to treat these surveys as reliable indices of crime in the tract? Given that crime does not distribute evenly across communities, tending instead to concentrate in relatively small geographic hot spots (Sherman, Gartin, and Buerger 37-42), we would suggest not. Specifically, we believe that it is reasonable to assume that while a minority of those who reside in census tracts will consider their tracts more safe than their neighbourhoods, the majority will consider their neighbourhoods more safe than their tracts. Accordingly, we believe that surveys that canvas perceptions of crime in the absence

of a definition of neighbourhood likely underestimate residents' perceptions of crime within tracts.

USING MAPPING TO CLARIFY PERCEIVED NEIGHBOURHOOD CRIME

We examined this question recently in two separate studies. In each we intentionally compared residents' estimates of crime at the level of undefined or perceived neighbourhood with estimates at the level of researcher-selected neighbourhood, and in each we hypothesized that estimates of crime would be lower at the level of perceived neighbourhood than in the researcher-selected neighbourhood. The first study involved parallel experiments conducted in the village of Cumberland in the Comox Valley on Vancouver Island, British Columbia, and in the village of Zouterwoude in the Netherlands (Kaal, Vanderveen, and McConnell). We asked 139 randomly selected adult residents of Cumberland (population 2,800, corresponding to a small census tract) and 142 randomly selected adult residents of Zouterwoude (population 4,300, corresponding to an average sized tract) to estimate property crime (i.e., house burglaries, car theft, theft from cars, and vandalism to cars) either at the level of perceived neighbourhood or at the level of researcher-selected neighbourhood (i.e., the village). We focused on property crime as it is the most common type of crime. We also asked the respondents to estimate social disorder (e.g., loitering youth, public drunkenness) and physical disorder (e.g., graffiti, garbage or litter in the streets). These two variables correlate with the occurrence of crime (Skogan 21-46), and we sought to determine if estimates at the level of perceived neighbourhood differed appreciably from estimates at the level of selected neighbourhoods, in the same manner predicted for property crime.

Figure 1: Example of a perceived neighbourhood in Cumberland.



To assess perceived neighbourhood, we asked respondents to outline their neighbourhoods with highlighters on 1:20,000 scale maps of their village. The participants in each village outlined their perceived neighbourhoods with relative ease. Inspection of their maps showed that perceived neighbourhoods extended beyond the village boundaries for a few participants, and that they coincided with the boundaries for a small number of participants. The majority, however, drew perceived neighbourhoods falling within the perimeter of their village, and most carefully outlined the streets that served as borders for their perceived neighbourhoods (see example in Figure 1). We used ArcView GIS to calculate the areas outlined by participants in each village. Descriptive statistics for these areas are presented in Table 1, showing that the mean perceived neighbourhoods were considerably smaller than the areas encompassed by the respective villages. However, although the mean perceived neighbourhoods were significantly smaller than the areas of the respective villages, out hypotheses for crime, social disorder and physical disorder received only partial and minimal support in Zouterwoude, and we concluded that confirmation of all three hypotheses would most likely occur in average sized census tracts in larger urban centres, where household victimization is generally higher than in rural areas (Gagnon and Mihorean 15).

Table 1. Perceived neighbourhood size by selected neighbourhood

Selected neighbourhood	Cumberland	Zouterwoude	N'hood A	N'hood B
Number of residents	2,800	4,300	4,400	3,700
Total area (km^2)	1.9	1.2	2.2	2.2
Mean perceived neighbourhood (km^2)	0.43	0.13	0.41	0.53

Accordingly, we extended our study by focusing on a selected neighbourhood in each of the Comox Valley's two major urban centres (McConnell and Kaal). Neighbourhood A, with approximately 4,400 residents, is located in Courtenay, a city of approximately 22,000 inhabitants. Neighbourhood B has approximately 3,700 residents and is located in Comox, an adjoining town of approximately 12,000 inhabitants. We again predicted that perceptions of property crime, social disorder and physical disorder estimated at the level of perceived neighbourhood would be less than estimates at the level of the researcher-selected neighbourhood. We also predicted that because Courtenay's annual crime rate is almost triple the rate in Comox (Government of British Columbia), respondents' estimates of crime and disorder would generally be higher for those living in Neighbourhood A.

We administered the same measures of property crime, social disorder and physical disorder to 151 randomly selected adults living in Neighbourhood A, and to 191 randomly selected adults living in Neighbourhood B, and again asked respondents to outline perceived neighbourhoods on maps of their selected neighbourhood. We used four different scales randomly distributed across participants ranging from 1:10,000 to 1:20,000, as part of a separate investigation of the relationship between map scale and perceived neighbourhood size. As before, almost all respondents outlined their neighbourhoods with relative ease, with the majority outlining neighbourhoods falling within the boundaries of their selected neighbourhood. And

again, the average perceived neighbourhoods were considerably smaller than the selected neighbourhoods (see Table 1).

However, unlike before, our experimental hypotheses received strong support. Specifically, estimates of property crime, social disorder and physical disorder were significantly lower at the level of perceived neighbourhood than selected neighbourhood in Neighbourhood A, while estimates of property crime and physical disorder for perceived neighbourhood were significantly lower in Neighbourhood B, indicating that the majority of respondents considered their own neighbourhoods to be safer than their selected neighbourhoods. Moreover, consistent with official crime data, and in support of the argument in favour of treating residents' perceptions of crime as a legitimate measure of crime, respondents' estimates of property crime at both levels of neighbourhood measurement were considerably higher in Neighbourhood A than in Neighbourhood B.

USING MAPPING TO IDENTIFY COMMONLY PERCEIVED UNSAFE AREAS

If residents' estimates of crime and disorder are grounded in objective awareness of the circumstances of their neighbourhoods or communities, one would expect agreement on the location of geographic hot spots of crime and disorder within their neighbourhoods or communities. We attempted to address this question in Cumberland by asking half the respondents to indicate on the map of their village any areas they considered unsafe for themselves or their loved ones, and by asking three follow-up questions: why they considered any identified area unsafe; if they or their loved ones avoided the identified areas; and when they or their loved ones avoided the identified areas.

As shown in the composite map reproduced in Figure 2, two areas were frequently identified as unsafe: a portion of the village's main street containing its pubs and bars; and an area in a park located near the main street. Review of answers to the follow-up questions revealed that the first area was considered unsafe and was generally avoided on Friday and Saturday evenings because of the potential for harm or trouble from intoxicated bar patrons, while the second was generally avoided after dark as a result of the threat associated with the youth believed to congregate in that area.

We did not correlate these data with official crime reports or with police impressions of disorder. However, they are consistent with established findings that crime and disorder increase in the vicinity of bars and nightclubs, particularly around "closing time" (Roneck and Maier), and in areas without "capable guardianship", such as parks, under-passes, and other poorly monitored areas (Miethe and Meier 51-52).

Figure 2: Composite map of perceived unsafe areas.

CONCLUSION

Incorporating mapping into our investigations of perceptions of crime and disorder proved advantageous for a number of reasons. First, it established that while the majority of respondents' perceived neighbourhoods fell within the boundaries of our selected neighbourhoods, they were, nevertheless, considerably smaller than our selected neighbourhoods. In doing so, mapping contributed to our speculation that discordance between estimates of crime and disorder at the level of selected and perceived neighbourhoods is likely to be most pronounced in urban rather than rural settings, where crime tends to be higher. Consequently, mapping contributed to our recommendation to define neighbourhood in surveys of crime and disorder in urban selected neighbourhoods. Finally, mapping confirmed that there is value in assuming that our mental representations of crime and disorder are inherently spatial, and, perhaps tautologically, that assessment of these representations can be enhanced using spatial formats.

There is a key direction for further research. Although mapping ostensibly represents a meaningful and user-friendly measure of perceived neighbourhood, it remains psychometrically unproven. To establish acceptable psychometric properties, one should first address reliability, which refers to determining accuracy or consistency of measurement. To the extent that mental representations of neighbourhood can be considered static or constant, we recommend measuring the temporal stability of residents' maps of their perceived neighbourhoods. Moreover, we recommend using more than one map scale to determine if certain scales are associated with greater stability. Assuming acceptable reliability, one would then ordinarily shift to the question

of validity, which, stripped down, refers to establishing that an instrument or scale "measures what it's supposed to measure". Given the absence of an agreed upon definition of neighbourhood, addressing this question is undoubtedly complex. However, linking residents' explanations of perceived neighbourhood boundaries with influential theoretical contributions such as Suttles' hierarchical model of neighbourhoods may well prove profitable.

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