Daily Rhythms 1: the ambient population and the spatio-temporal patterning of crime

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The patterning of crime varies with the daily rhythms of the city. The ebb and flow of urban populations hold clear impact on the spatio-temporal patterning of crime. Thus, accurate population-at-risk measures are required to quantify crime rates. Utilising resident and ambient (Andresen, 2011) population-at-risk measures, as well as geo and time coded crime data for a major metropolitan area in the UK, this paper seeks to determine statistically significant spatio-temporal hotspots for both property and violent crime. Addressing the association between the temporal patterning of crime hotspots and population-at-risk measures responds to recent calls in the international literature (Malleson and Andresen, 2016). Thus, we explore property and violent crime rates in relation to day-time, night-time, weekday, weekend resident and ambient (workday and mobile phone) population measures. Further, we test the suitability of diverse spatio-temporal clustering methods (E.g., Knox Tests and Kernel Density Estimations) to undertake this task. The results of this research imply the need to develop spatio-temporal specific explanations of crime, to consider the interplay between resident and ambient populations and the locations in which they interact.

Daily Rhythms 2: travel purpose, activity spaces and the spatio-temporal patterning of crime

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In examining the daily ebb and flow of urban populations and their impact on the spatio-temporal patterning of crime, it is vital to consider the interplay of travel purpose and the attributes of activity spaces. This task, building on the insights of routine activities theory (Cohen and Felson, 1979), demands the integration of transport, crime and environmental data. In this vein, recent research (Felson and Boivin, 2015; Boivin and Felson 2017) has sought to explore the association between the characteristics of ambient (visitor) populations and crime. It has done so, however, without being able to account for the temporal patterning of crime hotspots nor the specific influence of environmental characteristics on those hotspots. This paper seeks to address this shortfall. It uses a negative binomial model to evaluate the effects of ambient population on crime across a series of time periods. Then, following Mburu and Helbich (2016), it examines the spatial influence of environmental characteristics on crime hotspots through the deployment of eigenvector spatial filtering techniques. The data used in these exercises comprises travel diary, point of interest and crime data for a major metropolitan area in the UK. Ultimately, the paper uncovers the influence of the travel purpose of ambient populations and (environmental) crime attractors on the spatio-temporal clustering of crime. Moreover, it demonstrates that this interplay is time-dependent and varies according to whether property or violent crime is considered. The results of this research speak to the potential to develop more robust, though particular, explanations of crime.