

Review of: "How Urban Heat Islands Effect Crime: Understanding the Implications of Temperature, Population Density, and Green Canopy Cover in Shaping Built Environments"

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Potential competing interests: No potential competing interests to declare.

How Urban Heat Islands Effect Crime: Understanding the Implications of Temperature, Population Density, and Green Canopy Cover in Shaping Built Environments – REVIEW

This mixed-method study begins from the perspective that climate is one of many factors which influences criminal behaviour. It discusses the relationship between patterns of criminal behaviour and thermal (dis)comfort as affected by climate change and urban heat island effects, and the implications for urban design in terms of well- or poorly-designed spaces. The research draws on a case study of Midland, a suburb of Perth, Western Australia. Findings show limited positive correlations between long-term temperature, crime, population density, and green canopy cover. The paper concludes with recommendations in relation to making urban communities resilient to the impacts of global warming and future densification. All in all, this is an interesting and useful contribution to the cross-disciplinary urban climate literature.

The remainder of this review is structured as commentary (column 3) on the original paper (page and paragraph numbers, column 1). This includes both general comments, minor corrections and potential suggestions for improvements.

Page	Para	Commentary
2	2	Urban heat island effects are driven by absorption of solar gain by hard urban surfaces, reflection between those surfaces (e.g. in urban canyons) and emission of the absorbed solar energy as heat. Urban sprawl is not just a threat to arable land, but to unbuilt natural/semi-natural land at the edges of cities. Population growth can be argued as the "elephant in the room" vis-à-vis both urban sprawl and densification
2	3	It is noted that development at the city fringe pressures both agriculture and ecosystems. Urban development also impacts permeable surfaces which enable aquifer recharge. It is also noted that crime is influenced by demographic and socio-economic variables as well as built environment – important to avoid architectural determinism in this type of study. The word "to" after "towards" is redundant and should be deleted. "Reverting" should be "reversing". "Reducing microclimates" is better phrased as "reducing urban overheating".
2	4	Well noted that the natural and built environment also includes society and its institutions, in relation to shaping or triggering criminal behaviour.
		There has been a lot of research on factors which contribute to criminality

3	1	<p>There has been a lot of research on factors which contribute to criminality.</p> <p>Urban expansion and densification are both responses to population growth, but can be considered essentially as opposites. The reference to “the diversity of people such as that which occurs in ecotones” should be clarified.</p>
3	2	<p>Reference to “present chapter” – is this work part of a book?</p> <p>Tree canopy is not only a microclimatic factor - there are many other benefits of urban trees which may act as confounding variables in a study focusing on heat.</p> <p>What does “face validity” mean?</p>
3	3	Urban expansion and densification have quite different effects on climate, hence from this perspective could be expected to have quite different effects on criminality.
4	2	Affluent communities typically have more green infrastructure, which in turn affects crime rates.
4	3	Wet bulb temperature informs how a human might experience heat, but there are additional factors too - air speed, activity, clothing type. 35 degrees is quite extreme.
4	4	<p>Re controlling variables – does this mean that because there are many variables, they need to be controlled? Which ones?</p> <p>Another important positive impact of vegetation relates to biophilia.</p>
5	2	References to aggravated assaults, assaults with deadly weapon, robberies: presumably these are additional, not total? What are “susceptible” locations?
6	3	What is meant by “human tendencies”?
7	1	Does “decreased volume, traffic noise” mean “decreased volume OF traffic noise”?
7	2	<p>Regarding the publications named, who are the publishers, and what date(s)?</p> <p>Sentence beginning “Uses considered...” is difficult to follow.</p>
8	1	<p>“Raised a...” should be “raised as a...”</p> <p>“Reviewed” should be “reviews”.</p> <p>What is “almost metal fencing”?</p>
9	2	<p>What does “theoretical correlation” mean?</p> <p>“Higher temperatures increase crime rates” – Better to refer to temperatures which are higher than some threshold - otherwise (for example) it could include winter temperatures which are higher than usual but not hot, which are unlikely to affect crime rates.</p> <p>“Define” should be “defined”.</p>
12	1	Presumably the “minimum and maximum temperatures” are MONTHLY min and max?
12	3	Is monthly the right period to be measuring?
18	2	School holidays are a time when a lot of working people also take time off.
18	3	“Compromised the nuances of fundamental socio-demographics...” Is compromised the right word?
19	1	“Exposure to urban trees provides health benefits...” Definitely, and this cores well beyond mitigating urban heat.
19	3	<p>“Assessed weather–crime relationship at an hourly level...” This is interesting, and definitely worth further exploration.</p> <p>Very important to note that other variables (in addition to weather) are “very significant” in relation to effects on crime.</p>
21	2	“Crime may also change with population density.” Important point.

21	3	Spelling is "prima facie".
21	4	"Studied" should be "studies".
22	3	"There are other variables that may influence crime discussed throughout the paper." Absolutely. This perhaps suggests an opportunity to go beyond descriptive statistics and consider application of factor analysis.