

Thriving Plants, Thriving Communities: How Green Space Affects Crime in Urban Environments

Green2015: A Plan for the First 500 Acres” is a proposal project in Philadelphia created by PennPraxis, looking to convert 500 acres of unused or vacant urban land into green spaces (Steinberg et al., 2010). The proposal’s primary focus is the increased vegetative cover of school yards and empty lots as well as the creation of community gardens and playgrounds in some of these spaces. The project cites many economic and health benefits for the city, including a paragraph which mentions that, “A study underway . . . at the University of Pennsylvania shows that the greening of lots . . . [has] contributed to reduction in crime, (p. 21)”. Though this study has not yet been published, there is a diversity of existing research which concerns the relationship between green space and crime. The aim of this paper is to explore some of the findings of those works and connect it to the proposed changes for Philadelphia. By analyzing and compiling literature on community green spaces and crime rates, I hope to make the connection between theory and policy, looking at Green2015 as a model for potential changes in the ecological and social environment.

The correlation between community green space and health or well-being can be measured in many ways. Green spaces can encourage physical activity, alleviate pressures of air pollution, reduce the urban heat island effect, and provide water drainage, all affecting the physical and mental health of nearby residents (Steinberg et al., 2010). Green2015 reports that the city can save millions of dollars in health costs with the

addition of the proposed 500 acres. In this paper, I will be focusing on the characteristic of crime and fear-of-crime in urban neighborhoods as a measure of health. In the literature, crime is “identified as an important environmental stressor . . . linked with block-level shifts in anxiety and depression . . . linked negatively with community social and psychological ties,” (Perkins & Taylor, 1996). Though there are also specific health risks associated with individual participation in crime, such as the risk of STIs for sex workers, or the risk of injury or death due to violent assault, the general measurement of crime as a whole within this paper is connected to a broader idea of community level population health. People who feel safer going outside in their neighborhoods are more likely to gain access to physical activity and other health resources of the neighborhood in addition to avoiding the poor health consequences of crime (O’Brien, 2006).

The aim of this paper to address the effect of urban green space on crime levels will be addressed under a series of objectives. The first objective will be to determine if vacant lots or otherwise undeveloped government property increase the crime rate in a community. By looking at the effect that unkempt public space has on crime in city blocks with these features, I will attempt to identify if crime rates have the potential to decrease with the removal or change in these spaces. From there, my second objective will be to determine if certain kinds of green spaces have stronger effects than others on reducing crime. My third objective will be looking at possible limitations for the model and what confounding factors might quell the anticipated

benefits of adding green space to an urban community. My final objective will be to examine the policy proposal of Green2015 to see if the developments suggested are likely to reduce crime in Philadelphia over the next 4 years if the project is adopted.

Analysis

Crime and the deterioration of public spaces

A study done in the New Kensington neighborhood of Philadelphia found that, on average, vacant land made up an average of 10% of parcels on a given block (Wachter, 2005). Vacant lots, a common feature of any urban environment, may display different signs of vandalism or neglect, though not all of these spaces share the same visual characteristics. The unifying qualification of a vacant lot is the understanding that it lacks any kind of maintenance, it is most often owned by the city, and lacks any symbolic features indicating private space or ownership (Perkins, Rich et al., 1993). Though research acknowledges this vacant land as 'empty' space, it is primarily concerned with the lack of symbolic property or 'cues to care' which could also be a characteristic of parts of the land not so clearly categorized as 'vacant lot' (Kuo & Sullivan, 2001).

Symbols of ownership have a socially preventative relationship with crime, where these signs, ". . . suggest that the inhabitants actively care about their home territory and potentially imply that an intruder would be noticed and confronted," (Kuo & Sullivan, 2001, p. 347). This suggests that actions such as planting gardens, building fences, and posting address signs enforce a visual separation between owners and outsiders, and act as symbols of social control which are predicted to reduce crime (Perkins, Rich et al., 1993). A related theory is that of 'Defensible Space' where, "Interventions involve making physical changes to the areas around residences to make them less vulnerable

to crime and more supportive of the development of community among residents," (Brunson et al., 2001). This theory is useful for examining where defense against crime moves from the private residential scale to community spaces.

While private property is often marked with signs of territoriality, "A breakdown in social control is expected in territorial gaps along boundaries of a neighborhood or where there are non-residential land uses," (Perkins, Meeks, & Taylor, 1992). Thus, theories of territorial functioning traditionally assert that spaces such as parks, schoolyards, playgrounds and vacant lots are expected to experience higher levels of crime because of the lack of territoriality within public spaces (Perkins, Rich et al., 1993). A study done by Perkins, Rich, Wandersman and Taylor (1993) found that non-residential buildings were the strongest predictor of reported crime for blocks in New York City. In Philadelphia, it was found that proximity to vacant lots reduced property values by 18%, a factor associated with crime levels (Wachter, 2005).

'Physical and social incivilities' are features or behavior that, regardless of legality, ". . . symbolize not only a superficial neglect of the community, but also an underlying breakdown in both local norms of behavior and formal and informal social controls," (Perkins & Taylor, 1996, p. 66-67). Physical symbols of this kind include graffiti, litter and broken windows (Perkins & Taylor, 1996). Rather than symbols of defensive space or territoriality, these are signs of deterioration which might invite crime to happen and are seen as symbols of criminality which in turn are correlated with fear of crime (Perkins & Taylor, 1996). The Perkins and Taylor study (1996) identified any vacant lot as a 'physical incivility' of an environment, whereas well maintained parks or gardens were not included in this category. This distinction implies a certain cultural value which is negative for vacant lots but positive for parks (Perkins & Taylor, 1996). These same research-

ers, in a study with Wandersman and Rich, found that ‘perceived incivilities’, including unkempt property, poor sanitation, and litter, were related to “resident victimization and perceived crime and delinquency problems,” (p. 44).

These incivilities are related to the Broken Windows theory of Wilson and Kelling (1982). Their theory claims that one feature of the environment which would qualify as a physical incivility, such as a broken window, breaks down the boundaries of community responsibility (Wilson & Kelling, 1982, p. 30). Once this is symbolically broken by one act of physical incivility, the barrier to other vandalism and crime is broken, inviting more individuals to take part (p. 31). This tipping point indicates that the physical incivilities of aesthetics such as litter are expected to encourage more serious crimes such as robbery and assault (Wilson & Kelling, 1982). Thus, these incivilities, expected to occur on public property and which are more temporary symbols of disorder, are also predicted to increase crime and fear of crime in the neighborhood where they occur (Perkins, Rich et al., 1996). These markers of neglect also imply a lack of surveillance, increasing the attractiveness of the space to criminals and decreasing community accountability (Kuo & Sullivan, 2001). The research, in sum, suggest that unattended spaces which exhibit signs of neglect both encourage and communicate the expectation of more serious crimes in the neighborhood. This is important to understand when considering the expected benefits of converting the appearance or use of this land.

Does vegetation inhibit crime?

With a transition of vacant space or dilapidated non-residential urban spaces, the question emerges of what it should transition to in order to best benefit residents. It is here that research findings on the role of vegetation on crime and fear of crime come in. There

are factors associated with the presence of vegetation that can give people individual and community benefits. Studies have looked at factors such as increasing confidence and investment in community, increased neighborhood surveillance, and reduction of psychological stress. Because factors such as psychological stress might encourage crimes such as assault, psychological and social benefits of parks can be expected to reduce crime. Several studies have suggested that vegetation can reduce crime through increased surveillance and mitigation of certain psychological triggers to violence (Kuo & Sullivan, 2001) Though there has been historical concern in the literature that increased vegetation limits visibility in public space and thus supports higher crime levels, these newer studies suggest that these ideas are misguided and vegetation can provide wide benefits while maintaining visibility.

If vacant lots and dilapidation of urban spaces through physical incivilities symbolize neglect and vulnerability to crime, then creating signs of care can provide symbols suggesting surveillance, community ownership, and care (Brunson et al., 2001). Gardens are markers of territoriality and defensive space, with plants on private property being statistically related to fewer reported crimes (Perkins, Rich et al., 1993). These same markers can be translated into public property, where well managed vegetation operate as “secondary territories . . . rather than territorial gaps” in the urban ecology (Perkins, Rich et al., 1993, p. 44). Communities can create visual symbols of care in the collective environment or publicly funded green space management can encourage residents to spend more time outside, but in either case, the visual evidence of care created in these spaces through vegetation indicates an increased surveillance of outdoor spaces (O’Brien, 2006). “The mere presence of residents in a space may actually discourage destructive or inappropriate behavior,” (Brunson et al., 2001, p. 643). In these environments, well maintained public green spaces would contain signifiers of private space, deter-

ring crime despite their public nature.

Psychological factors are important to consider when looking at role of crime in community spaces. The permanence of public spaces which are regularly managed or the presence of trees which grow for generations can give neighborhoods a sense of stability in the ever shifting urban environment and increase networks of social control while decreasing mental fatigue (Covington & Taylor, 1988). Mental fatigue, causing symptoms of irritability, inattentiveness, and impulsivity, has been linked with aggression and violence (Kuo & Sullivan, 2001). One study found that window views from home which included trees were significant determinants of “Feeling at Peace”, an emotion associated with low levels of mental fatigue (Kaplan, 2001)#. Views including gardens, landscaping and trees were strongly correlated with the variables “Satisfaction with Neighborhood” #and “Effective Functioning” (Kaplan, 2001). If residents with a view of nature outside their window are more likely to feel satisfied with their neighborhood, they may be more likely to invest in other ways into towards the quality of that neighborhood, creating a positive feedback loop of community participation, crime reduction and mental well being (O’Brien, 2006).

Despite the benefits, there is a fear that vegetation reduces visibility and in doing so increases the vulnerability of a space to crime (Kuo & Sullivan, 2001). A study done in Chicago by Kuo and Sullivan found that vegetation significantly and negatively related to levels of both property crime and violent crime (Kuo & Sullivan, 2001, p. 354). As long as the vegetation preserved visibility, with low plants and high canopy trees, individuals living in buildings with greener surroundings reported less crime and a greater sense of safety (Kuo & Sullivan, 2001, p. 348). Other studies found that public gardens and playgrounds were related to lower rates of resident victimization, perceived crime, and delinquency problems (Perkins, Rich et al.,

1993). These spaces were characterized by environmental features which emphasize surveillance such as outdoor seating and unobstructed sight lines (Perkins, Rich et al., 1993). By creating spaces conducive to resident presence, feelings of community are encouraged and developed, increasing investment in these public spaces while also increasing surveillance (Brunson et al., 2001).

Discussion

Confounding Factors and Model Limitations

Some studies suggest that the relationship between green space and crime is much more complicated than the negative association depicted in the conventional model. The relationship between these variables is a growing body of research and while most of the studies could determine an association, the discussion on causation was less standardized. In public health modeling, interdependence of observations, distal variables, and proximal variables add complexities that can feed back and affect the crime and health conditions#. It is important to account for these ambiguities in looking at how factors such as property value and community cohesion can complicate a model of causation.

Feedback loops are important to consider in models of public health, especially when considering the distal factors such as the economy, police structures, and local government policy. Higher crime levels negatively affect property values when controlling for income and other demographic factors, which suggests that reducing crime in neighborhoods might also change levels of poverty and provide secondary health benefits (Grove & Troy, 2008). One study found that investing in and creating green space in urban neighborhoods can increase property values up to 30% (Wachter, 2005) while other studies suggest that neighborhoods with high property values are more likely to invest in features such as parks and neighbor-

hood green space (Grove & Troy, 2008). For example, while a neighborhood that invests in greening community space might expect to benefit from these changes, the neighborhood is also expected to be wealthy enough to afford the initial investment, reducing the additional benefits. These intertwined factors suggest a complicated feedback model that would be important to consider when looking at the possible crime-reductive properties of green spaces.

There is an additional complication when it comes to definitions and categorizations of land uses and their effects within the data. Vacant lots, for instance, are categorized as a physical incivility in one study (Perkins & Taylor, 1996) but are included in the category of “open land use” along with parks, gardens and playgrounds in another study (Perkins, Rich et al., 1993). These differences reflect an overlapping of theory which has not yet created clear categorization. It may be that with more research and development of the subject these kinds of details will become more standardized. By clarifying the definition and increasing the reliability of the variable “empty lots” in statistical analysis it might become clearer whether or not empty lots have a positive or negative influence over crime in urban neighborhoods.

A study in Baltimore found that increases in property value that were gained from proximity to parks had a threshold in the crime rate where proximity to parks started to negatively influence home values (Grove & Troy, 2008). This threshold, when the crime rate was around 450% of the national average, indicates that the benefits of public green space may only be effective for neighborhoods which already maintain a certain level of social control. This study also did not qualify what was defined as a ‘park’, and left open the possibility that such areas might still benefit from well managed gardens or vegetation which maintains high visibility levels rather than dense woodland (Kuo & Sullivan, 2001; O’Brien, 2006). This kind of research

is important when looking into policy making, and there are still questions about these issues in the literature.

Conclusion

Is the policy proposal of Green2015 likely to reduce crime in Philadelphia over the next 4 years if adopted? The answer is nuanced and uncertain as to whether this proposal will be effective based on the literature. One important lesson from the research is that trees, even in small spaces such as street edges, can have positive effects on the crime rates and psychology of residents (Kuo & Sullivan, 2001; Kaplan, 2001). Trees, therefore, are expected to create benefits for Philadelphia as a part of any future green development. Part of the Green2015 plan includes the greening of small areas such as schoolyards with trees which could ultimately be an addition to the landscape that could greatly benefit residents while maintaining visibility (Steinberg et al., 2010).

The methods by which the plans are planned and executed have a key role in their expected success. Community involvement and decision making is critical in the success of green space development (Kaplan, 2001). Matching up the features of the community with the preferences of the community members could contribute greatly to the benefits they might gain from the spaces themselves. The community might also be more inclined to participate in the management of certain projects rather than others, and be willing to spend more time outside and building the symbols of care in a neighborhood space which reflects the needs and desires of the community, including cultural or social concerns or goals (O’Brien, 2006). The participation itself is an important contributor to feelings of safety, affecting the citizens beyond the reduction of crime. In a study on individual appropriation of public space, Brunson, Kuo and Sullivan (2001) found that, “Residents who defended near-home space through territorial appropriation experienced the neighbor-

hood as a safer, more cohesive community than did residents who did not appropriate space in this way,” (p. 626). Green2015 has outlined a plan for community involvement in decision making for each parcel of the 500 proposed acres (Steinberg et al., 2010, p. 30-33). It is this aspect of the plan which can most facilitate a beneficial introduction of green space without also introducing crime or physical incivilities. Based on the strength of this plan and results from the future execution from such a plan, cities throughout the world can access further historical resources for how to use vegetation cover to lower crime rates and improve the health and safety of urban residents.

References

- Brunson, L., Kuo, F. E., & Sullivan, W. C. (2001). Resident appropriation of defensible space in public housing: Implications for safety and community. *Environment and Behavior*, 33(5), 626-52.
- Covington, J. & Taylor, R. B. (1988). Neighborhood changes in ecology and violence. *Criminology*, 26(4), 553-89.
- Grove, J. M. & Troy, A. (2008). Property values, parks, and crime: A hedonic analysis in Baltimore, MD. *Landscape and Urban Planning*, 87(3), 233-245.
- Kaplan, R. (2001). The nature of the view from home: psychological benefits. *Environment and Behavior*, 33, 507-542.
- Kuo, F. E. & Sullivan, W. C. (2001). Environment and crime in the inner city: Does vegetation reduce crime?. *Environment and Behavior*, 33(3), 343-367.
- O'Brien, E. (2006) Social housing and green space: a case study in inner London. *Forestry*, 79(5), 535-551.
- Perkins, D. D. & Taylor, R. B. (1996). Ecological assessments of community disorder: Their relationship to fear of crime and theoretical implications. *American Journal of Community Psychology*, 24(1), 63-107.
- Perkins, D. D., Meeks, J. W., & Taylor, R. B. (1992). The physical environment of street blocks and resident perceptions of crime and disorder: Implications for theory and measurement. *Journal of Environmental Psychology*, 12, 21-34.
- Perkins, D. D., Rich, R. C., Taylor, R. B., & Wandersman, A. (1993). The physical environment of street crime: Defensible space, territoriality and incivilities. *Journal of Environmental Psychology*, 13, 29-49.
- Popp, T. (2011, June 24). The park of a thousand pieces. *The Pennsylvania Gazette*, 48-53.
- Steinberg, H., Keegan, B., Goodman, A., Miller, M., & Tranguich, M. (2010) Green2015: An action plan for the first 500 Acres. PennPraxis for Philadelphia Parks and Recreation. Retrieved from http://issuu.com/pennpraxis/docs/green2015_full
- Wachter, S. (2005). The determinants of neighborhood transformations in Philadelphia identification and analysis: The New Kensington pilot study. Retrieved from http://www.kabaffiliates.org/uploadedFiles/KAB_Affiliates.org/Wharton%20Study%20NK%20final.pdf
- Wilson, J. Q. & Kelling, G.L. (1982, March) Broken windows: The police and neighborhood safety. *Atlantic Monthly*, 29-38.