



## Research Paper

# The effects of produce gardens on neighborhoods: A test of the greening hypothesis in a post-industrial city



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## HIGHLIGHTS

- We review factors associated with individual's landscaping decisions.
- We review mechanisms for the development of neighborhood landscape patterns.
- Yard maintenance was better for properties nearby a produce garden.

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## ABSTRACT

Researchers have found that gardens and landscaping designs can diffuse throughout neighborhoods. In the present study, we extend this research by examining if produce gardens on reclaimed vacant lots can have a radiating and positive, linear effect on the surrounding residential parcels. If well-maintained parcels tend to cluster together then we would expect that parcels proximal to a well-maintained produce garden would have better maintenance than parcels near an undeveloped vacant lot. We refer to this transformative process as the *Greening Hypothesis*. In the present study, we investigate yard maintenance observations of residential properties located near a produce garden, compared with those near an undeveloped vacant lot while controlling for residents' neighborhood perceptions and census demographic data. Our study area was urban and residential with higher than normal levels of property abandonment and urban blight. Our results, supporting the *greening hypothesis*, indicated that residential parcels proximal to produce gardens were better maintained than parcels near undeveloped vacant lots. Study implications support policies and programs which include greening initiatives as part of community development strategies.

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## 1. Introduction

Researchers have found that well-maintained, natural areas such as gardens may lead to improved mental health, reduced crime and promote good health and well-being (Groenewegen, den Berg, de Vries, & Verheij, 2006). Residents who participate in community gardens or beautification efforts are more likely than non-participants to report a greater perception of social capital and neighborhood norms and values (Alaimo, Reischl, & Allen, 2010). Conversely, indicators of urban blight are associated with higher levels of crime, fear of crime (Perkins & Taylor, 1996; Ross

& Mirowsky, 1999; Taylor, Shumaker, & Gottfredson, 1985), perceptions of social disorder (Ross & Mirowsky, 1999; Taylor et al., 1985), lower neighborhood satisfaction, and reduced investment in neighborhoods (Dassopoulos, Batson, Futrell, & Brents, 2012; Immergluck & Smith, 2006).

The decline of a neighborhood into disorder is a complicated process due to the dynamic nature and individualistic factors of each community. Social disorganization is a result of the community experiencing a breakdown of social bonds, which reduces social capital, community engagement and community attachment (Bursik, 1988). Urban blight characteristics include physical incivilities such as graffiti, littering, and signs of poor home maintenance (Perkins, Meeks, & Taylor, 1992). If residents in blighted neighborhoods are more likely to disengage from their neighborhoods, then improving blighted properties may break the downward spiral of neighborhood disorder and facilitate residents' engagement

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and social bonding. There are government and non-profit organizational programs that aim to improve blighted properties while also engaging community members to address this issue.

Community greening projects are one strategy for engaging residents in improving blighted properties. We use the term *greening* to refer to the process of restoring the landscaping and beauty of blighted property. Greening projects promote controlled growth and maintenance of natural areas, such as parks, gardens and residential yards. A greened property parcel has evidence of care such as groomed grass, bushes, trees or other natural landscaping, or planted areas such as a rock, flower, or edible garden (includes fruits, vegetables and herbs). In our study we focus on produce gardens, which refer to a parcel with the sole purpose of growing edible plants that is currently maintained, and does not include residential gardens. Produce gardens are a good indicator of greening because they cover a relatively large area that likely requires multiple individuals to continuously maintain signs of care. Produce gardens are a visible indicator of community investment that may lead to changes in neighboring resident's yard maintenance through a variety of processes such as individual-level factors, neighborhood norms and preference for specific landscaping esthetics. To explore how produce gardens may be associated with residential yard care it is important to understand an individual's motivation to care for their property.

A variety of factors influence residential yard maintenance. Typically, a resident's decision about landscape management is the result of individual factors such as personal values, attitudes and lifestyle factors (Chowdhury et al., 2011). Various factors across multiple ecological levels (e.g., neighborhood, city, state and federal), however, can influence how an individual cares for their property (Chowdhury et al., 2011; Grove et al., 2006; Troy, Grove, O'Neil-Dunne, Pickett, & Cadenasso, 2007). Within each level are multiple factors that can affect an individual's landscape. Even though a wide span of landscape designs and maintenance are possible at the individual parcel level, landscaping patterns can develop within a community (Chowdhury et al., 2011). These neighborhood patterns indicate that residents take into account their neighbors when making landscaping decisions (Nielson & Smith, 2005).

Researchers have theorized that residents are influenced by their neighbor's landscaping through ideas such as ecology of prestige, the halo effect and mimicry (Grove et al., 2006; Julien & Zmyslony, 2001; Nassauer, 2011). Most residents want to adhere to neighborhood norms and group identity particularly if the neighborhood characteristics are representative of a higher socioeconomic status (Chowdhury et al., 2011; Grove et al., 2006). A resident with a well-maintained parcel is more likely to be described as hard-working, proud of their home and a considerate neighbor (Nassauer, 1995, 2011). These mechanisms suggest group-level factors such as neighborhood social bonding, accountability, cohesion, norms and values intermingle to influence residential landscape decisions (Chowdhury et al., 2011; Sullivan, Kuo, & Depooter, 2004). The development and maintenance of landscaping therefore may be an indication of neighborhood social capital, norms, group identity and overarching psychosocial characteristics.

The neighborhood norms and group identity can shape the esthetic appeal of a property, which can lead to changes in private landscapes to align with a desired appearance (Gobster, Nassauer, Daniel, & Fry, 2007). In a model developed by Gobster et al. (2007), the relationship between landscape esthetics and resident behavior is bi-directional; meaning residents can alter the esthetics of a landscape, and changes in landscape esthetics can alter resident's perception and influence behavior. This esthetic cycle can contribute to the spread of greening within neighborhoods (Gobster et al., 2007). What constitutes as attractive in landscape design is

debatable, and standards can vary by individuals and groups but, our national culture tends to find organized, well-defined (mowed, weeded) yard maintenance as the most appealing design (Donovan & Prestemon, 2012; Nassauer, 1995). Additionally, in a study of rural and suburban residents, landscapes that had signs of care were deemed most attractive (Nassauer, 1988a, 1988b, 1992). Signs of care, also known as cues to care, include mowing, weeding, no litter or trash and other indicators of intentional, on-going human care (Nassauer, 2011; Nassauer & Raskin, 2014). Indications of care are likely to increase the possibility that residents will view a yard as attractive.

Typically, esthetically pleasing properties show signs of care that indicate guardianship and surveillance, which can be used to prevent crime in neighborhoods (Sullivan et al., 2004; Troy et al., 2007). The Crime Prevention through Environmental Design approach (CPTED; Cozens, Saville, & Hillier, 2005; Jeffrey, 1971) is a crime prevention framework that suggests that changes in the physical environment of a neighborhood will both reduce places for crime to occur and help create an atmosphere of caring and community cohesion. Using certain CPTED principles, Branas et al. (2011) found a reduction in gun assaults nearby undeveloped, vacant parcels enrolled in a greening program. The greening program was similar to transforming an abandoned, vacant lot into a produce garden in that it was a cue to care. If a produce garden becomes a cue to care it likely increases the attractiveness of the property and thereby may influence nearby individual yard maintenance (Chowdhury et al., 2011). It may be small actions within a neighborhood, such as maintaining a produce garden, that will spread among residents through social connections and interactions that impact neighborhood norms (Nassauer, 2011). These neighborhood norms may increase the likelihood of landscaping or neighborhood yard maintenance patterns.

Although researchers have found that landscaping can diffuse throughout neighborhoods to form landscaping patterns, a question remains if well-maintained greened properties, such as produce gardens, can have a similar positive effect on the surrounding residential parcels in neighborhoods with urban blight. If greened parcels tend to cluster together, as Hunter and Brown (2012) found in their study with easement gardens, then we would expect parcels proximal to a greened parcel would have better yard maintenance than parcels near an undeveloped abandoned parcel. We refer to this mimicry process as the *Greening Hypothesis*: improving or beautifying the landscape of a blighted parcel will promote yard maintenance on nearby parcels. In the current study, we focused on the radiating effects of a particular type of greening, produce gardens, on nearby occupied residential parcels. We selected produce gardens as our greened parcels due to their required attention and upkeep (definition requires current maintenance) and size (likely multiple individuals required for care). We compared the yard maintenance of residential parcels located near produce gardens with comparable parcels without a nearby produce garden.

## 2. Methods

### 2.1. Study design

This study compared the yard maintenance of two types of residential properties: those located near a produce garden and those not near a produce garden. We utilized two sources of data: observer ratings of parcel maintenance and community or neighborhood factors that influence individual parcel yard maintenance. We considered neighborhoods (i.e. Census block groups) as clustering units that contain individual property parcels (i.e., parcels nested within neighborhoods). We expected parcels within the

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