

"The Power of Trees "

By Tina Prow. Reprinted from *The Illinois Steward*, with permission. Volume 7 Issue 4. Winter 1999.

People need trees. They need to see leaves from their windows, to sit in green spaces, and to play in the shade. Trees draw people out from behind walls of brick and glass, and in coming together, neighbors forge relationships, nurture children, and build a sense of community. Those are key findings from a series of studies conducted by a University of Illinois College of Agricultural, Consumer and Environmental Sciences (ACES) team.

In the ACES Human-Environment Research Laboratory, Frances Kuo and Bill Sullivan combine interests in psychology and environmental design, policy, and planning to learn how people are affected by green areas in their environments and how people can become involved in making their environments better. They conduct much of their research in Chicago's public housing neighborhoods. Some housing units have trees and grass. More often, however, people live in areas the researchers describe as barren no-man's lands, moonscapes, or urban deserts, where unrelieved stretches of concrete, asphalt, brick, and glass are testimony to the opinion that trees are luxuries the city cannot afford.

Trees Bring People Together

The research team is challenging that viewpoint with accumulating data that show trees are integral to quality of life and may alleviate some costly social ills. "Nature at every doorstep," the researchers suggest, should be a goal of city planners. Their data show that planting more trees to create a more fit environment in urban areas could yield savings measured in fewer calls to police, less strain on social services, and reduced demand for medical services.

The team's work builds on two key ideas from earlier research: Physical environments can contribute to mental fatigue, and natural environments can help alleviate that fatigue.

"The inner city has all the ingredients of an incredibly mentally fatiguing environment. The crowding, noise, violence, and other factors just drain a person," Kuo said. "It seemed valuable to take a look at whether green areas in Chicago would make a difference in levels of mental fatigue."

To find out how adults are affected by trees, the team designed a series of studies of residents in the Robert Taylor Homes in Chicago. The 28 architecturally identical, 16-story buildings form the largest public housing development in the world. Some buildings have grass and trees nearby, and some are surrounded by concrete and asphalt. The particular building a public housing applicant is assigned to is a matter of chance.

"What we have here is a naturally occurring experiment which gives some confidence that the differences we found in social behaviors were due to the trees and not to other factors," Kuo said.

The researchers hired and trained residents from the public housing development to conduct interviews of their fellow residents. This helped ensure a comfortable match in gender and race with the residents. Answers to questions designed to evaluate aspects of the resident's daily functioning revealed distinct differences between people in barren buildings and those who had trees around their buildings. People in buildings with trees knew and socialized more with neighbors from their buildings, had a stronger sense of community, and felt safer than people in buildings without trees. They also felt better adjusted to where they were living compared to residents in barren buildings.

Findings from another component of the research suggested an explanation. When the research team made 100 observations of outdoor common spaces in housing developments, they found adults and children gathered more often in spaces with trees, compared to spaces with no trees. By drawing people out of their homes, the trees created an opportunity for neighbors to interact and develop community relationships, Kuo said, noting that other studies have shown strong neighborhood ties contribute to better physical and mental health.

That may account in part for why researchers found fewer reports of physical violence in homes that had trees outside the buildings. During interviews, those residents reported using more constructive, less violent ways of dealing with conflicts involving their children and partners than residents living in buildings without trees. Of 150 residents interviewed, 14% of residents living in barren conditions have threatened to use a knife or gun against their children versus 3% for the residents living in green conditions.

The relationship between trees and how well people function is an indication of how integral nature is to a fit human habitat, Kuo said. "Just as animals in unfit environments develop certain behavioral and functional pathologies, we may see more child abuse or crime or other problems when people live in unfit environments."

"Imagine feeling irritated, impulsive, about ready to snap due to the difficulties of living in severe poverty," she added. "Having neighbors you can call on for support means you have an alternative way of dealing with your frustrations other than striking out against someone. Places with nature and trees may provide settings in which relationships grow stronger and violence is reduced."

To find out what those places should look like, researchers offered residents a chance to see computer-simulated pictures of their building courtyards. Each simulation showed a different landscape design. The residents rated how much they liked each landscape and how safe they would feel in the different settings.

"When people see what their environment could look like, they're positive and excited to imagine courtyards with trees-and the greener the better," Sullivan added. "Overwhelmingly, people living in housing developments want trees, yet thousands look out over concrete."

One surprising finding from the photo simulation study was that residents identified settings with trees as places where they would feel safe. In fact, Sullivan noted, the more densely planted pictures received the highest safety ratings. In addition, people living near trees reported feeling safer than those living in more stark surroundings. Building managers and police had predicted trees would increase feelings of fear.

"The key is being able to see children playing and being able to scan a space and feel safe. So some landscape choices are going to work better than others, say an oak rather than a pine," he said. The researchers plan to examine crime and safety in green and concrete spaces further by using data from the Chicago Police Department.

Child's Play

Because more than 50 percent of the residents in some housing developments are children under 14 years of age, the team designed a study to evaluate children's everyday activities and experiences in outdoor spaces and to examine whether green space is important to a child's development. Again using the strategy of training public housing residents who could make observations without disrupting residents, the researchers focused on outdoor activities of children in the Ida B. Wells public housing development of 110 low-rise apartment buildings in Chicago.

From observations of 337 groups, including 114 groups with children, the researchers found that children played in outdoor spaces with trees about twice as often as in barren spaces around their homes. Children played in a variety of ways. Some play was rule-bound conventional play, such as softball, card games, and tag. But children with access to green space also engaged in more play activities characterized as "creative play" compared with children in stark play areas. Pretending and playing with dolls, devising new jump-rope routines, and creating hand-clapping songs are examples of creative play.

Importantly, children playing among trees also had more frequent contact with adults, in part because adults spent more time in green spaces than in barren areas. The analysis indicated children had double the access to adult attention in green spaces, compared to barren

spaces. Creative play and access to adults are important to cognitive and social development of children, Kuo said.

"One important finding of this study was that kids in public housing areas with trees are not so different from other kids in what they do, but kids in barren areas have starkly different experiences," she said. "We see clearly in these studies that trees contribute to the environment that supports healthy development."

Plant an Idea; Plant a Tree

Kuo and Sullivan find keen interest in their research. Journalists from around the country have interviewed them and they were among scientists invited to appear on "The Forest Where We Live," a documentary produced by the Louisiana Public Broadcasting Service.

During the filming, Kuo admitted, "Before we started our research, I would have said trees are nice, but the problems we're facing in our cities and our budgets are such that I'm not sure they're worth it. I think that through this research, I have become convinced that trees are really an important part of a supportive, humane environment. Without vegetation, people are very different beings."

The researchers created the Human-Environment Research Laboratory website to make their research more accessible worldwide.

Repeated in articles and interviews, their message is clear: "Trees have the potential to reduce social service budgets, decrease police calls for domestic violence, strengthen urban communities, and decrease the incidence of child abuse."

Chicago officials heard that message last year. The city government spent \$10 million to plant 20,000 trees, a decision influenced by Kuo and Sullivan's research, according to the Chicago Tribune. The researchers hope that the Chicago effort, combined with new "greening" initiatives in Providence, Rhode Island, and Philadelphia, Pennsylvania, point to a change in policy makers' attitudes toward trees and landscaping in urban areas.

It is a change that residents of the housing developments would likely welcome. Not only do they want trees, many said they want to be involved in planting and maintaining their landscapes, the researchers said.

"We're not suggesting a Sherwood Forest in every neighborhood," Sullivan said, "but it is important for people to be able to walk out their doors into spaces with some greenness. Daily contact makes a significant difference in a range of ways and at different ages."

With that in mind, the researchers are planning a new component of the research to examine how green landscapes may increase the vitality and longevity of older adults. Kuo and Sullivan also want to look more closely at "why" and "how" trees affect human behavior and functioning.

"We've taken a broad view that has yielded some exciting findings, but haven't even begun to see the tip of the iceberg," Kuo said. "We

can say now that trees make a difference, but there's a tremendous amount of work to be done before we know what the 'minimum daily requirement' is or how to achieve that in urban environments."

Various grants have supported the Human-Environment Research Laboratory over the years, including grants from the U.S. Forest Service, the National Urban and Community Forestry Advisory Council, and the U.S. Housing and Urban Development Agency.

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***Note: The Human-Environment Research Laboratory disbanded in 2005, and their has been replaced by the Landcape and Human Health Lab website, which you are currently visiting (<http://www.lhhl.uiuc.edu>).