



# Women Who Walk: Study Looks at the Impact of Neighborhood Design

Examining the impact of neighborhood design on physical activity

## SUMMARY

Researchers at [Cornell University College of Human Ecology](#) examined walking patterns of women moving into neighborhoods designed following new urbanism principles and women moving into traditional suburban neighborhoods. They also determined aspects of neighborhood design that predict walking patterns.

## Key Findings

- Women who moved to new urbanist neighborhoods did not walk significantly more than women who moved to traditional suburban neighborhoods.
- Women who moved to neighborhoods with fewer cul de sacs walked more after they moved than they had prior to their move.
- Demographic characteristics such as prior walking patterns, race and household size were significant predictors of walking patterns post-move. Neighborhood design characteristics accounted for 16.2 percent of change in walking patterns.

This project was part of the Robert Wood Johnson Foundation's (RWJF) *Active Living Research* program (for more information see [Program Results](#)). The program funds research that improves knowledge and policies regarding ways that environmental factors affect physical activity, particularly for children.

## Funding

RWJF supported the project with a solicited grant of \$100,000 between January 2004 and February 2007.

## THE PROBLEM

By 1999–2000, some 65 percent of Americans aged 20–74 were overweight and 31 percent were obese, according to a report from the [U.S. Centers for Disease Control and Prevention](#). The 1996 *Surgeon General's Report on Physical Activity and Health* notes

that regular physical activity reduces obesity and health risks such as diabetes, coronary heart disease and hypertension.

Emerging research suggests that environmental factors play an important role in promoting or inhibiting active lifestyles. At the same time, "new urbanism" neighborhood design has grown in prominence (Calthorpe P and Fulton W. *The Regional City: Planning for the End of Sprawl*. Washington: Island Press, 2001; Duany A et al. *Suburban Nation: The Rise of Sprawl and the Decline of the American Dream*. New York: North Point Press, 2000). New urbanism principles emphasize sidewalks, porches, tree-lined streets, modest-sized lots, small street-to-dwelling setback distances and central social spaces.

Proponents of new urbanism claim that greater physical activity is a likely benefit from new urbanist neighborhoods. Yet, there has been little empirical research examining the relationship between physical attributes of communities and patterns of physical activity among people who live in them.

Most studies of these relationships have examined behavior at only one point in time and therefore cannot establish causal linkages between neighborhood design and exercise levels (Bauman AE et al., *Journal of Preventive Medicine*, 23(2S): 5–14, 2002). Moreover, most have measured factors such as changes in use of cars rather than in physical activity, per se, according to researchers at Cornell University College of Human Ecology.

## **Habitat for Humanity**

**Habitat for Humanity** was established in 1976 with the goal of eliminating poverty housing stock and making decent shelter a matter of conscience and action. By 2003, Habitat had built more than 100,000 houses across the world.

In 2003, Habitat for Humanity began construction in one community in Alabama, two in Georgia and one in Florida. Two of these four developments featured new urbanist principles and two featured traditional suburban design. About 100 low-income, primarily African-American, families moved to these neighborhoods.

## **CONTEXT**

RWJF has developed three integrated strategies to reverse the childhood obesity epidemic: evidence, action and advocacy.

### **Evidence**

Investments in building the evidence base will help ensure that the most promising efforts are replicated throughout the nation.

- The Foundation's major research efforts in this area—*Active Living Research*, *Healthy Eating Research* and *Bridging the Gap*—are contributing to the nation's collective knowledge about the changes to policies and to community and school environments that are most effective in increasing physical activity and improving nutrition for kids.

RWJF also seeks to evaluate innovative approaches under way in states, schools and communities across the country.

- For instance, RWJF supported an independent evaluation of efforts to implement [Arkansas Act 1220](#), which mandated a comprehensive approach to addressing childhood obesity in public schools.
- The Foundation also funded a separate initiative to analyze body mass index (BMI) data for all Arkansas public school students. Already, the BMI analysis has indicated that, in just three years, Arkansas has halted the progression of the epidemic in the state.

## Action

RWJF's action strategy for communities and schools focuses on engaging partners at the local level, building coalitions and promoting the most promising approaches.

RWJF is working with the Food Trust, a Philadelphia-based advocacy organization whose mission is to ensure that everyone has access to affordable, nutritious food. The Food Trust has been [bringing supermarkets back to underserved communities in Pennsylvania](#), and with RWJF is working together to replicate those results nationwide.

RWJF is also working closely with the Alliance for a Healthier Generation (a partnership of the American Heart Association and the William J. Clinton Foundation) to support its efforts to improve nutrition, physical activity and staff wellness in schools nationwide.

## Advocacy

As staff learns from the evidence and action strategies, RWJF shares results by educating leaders and investing in advocacy, building a broad national constituency for childhood obesity prevention.

RWJF supported the National Governors Association when Arkansas Governor Mike Huckabee designated wellness in schools, homes, and workplaces as his Chairman's Initiative for 2005–2006.

Through the *Leadership for Healthy Communities* initiative, RWJF works closely with national organizations that represent elected and appointed officials—such as the National Conference of State Legislatures and the U.S. Conference of Mayors—to educate their members about successful approaches to increasing physical activity and

healthy eating among kids. The goal is to support leaders and decision-makers in their efforts to create healthier states, counties and cities.

## THE PROJECT

As part of a prior unrelated housing study, Nancy M. Wells, PhD, associate professor at Cornell University College of Human Ecology, analyzed physical activity patterns among women before they moved to their Habitat for Humanity neighborhoods.

The research described here was part of RWJF's *Active Living Research* program (for more information see [Program Results](#)). The program funds research that improves knowledge and policies regarding ways that environmental factors affect physical activity, particularly for children. Wells and colleagues took advantage of a "natural experiment" in which women who had partnered with Habitat for Humanity relocated to one of two types of neighborhood to:

- Determine whether women living in new urbanist neighborhoods have different walking patterns than women who live in traditional suburban neighborhoods.
- Determine whether women who moved to new urbanist neighborhoods had different patterns of walking after they moved compared to before they moved.
- Examine how neighborhood design features influence patterns of walking.

## Methodology

Researchers:

- Interviewed 70 women about one year after they moved into their new homes. Some 32 of these women were also interviewed before their move as part of the prior study.
  - Some 77 percent of the women were African American and 17 percent were White. Some 79 percent were single. There were, on average, 1.86 children per household.
  - Some 21 percent of women were healthy weight, 25 percent were overweight and 54 percent were obese or severely obese according to their BMI.

Including women who participated in both studies allowed researchers to examine individual changes in walking and to identify neighborhood variables, including new urbanist design features that explain those changes.

Each participant received \$40 as a "thank-you" for participation.

- Analyzed data from pedometers that residents wore after they moved and compared recordings with data from pedometers worn by women in the earlier study.

Researchers also planned to use accelerometers (activity monitors) but found that they were not reliable in usage.

- Recorded neighborhood characteristics including street patterns, number of commercial establishments and presence of sidewalks and porches. They used observations and geographic information system (GIS) mapping techniques to document these characteristics.

Women who moved to traditional suburban neighborhoods served as the control group for comparison with women who moved to new urbanist neighborhoods.

## FINDINGS

Wells and colleague Yizhao Yang, Ph.D., presented the following findings in an article entitled "Neighborhood Design and Walking: A Quasi-Experimental Longitudinal Study" in the *American Journal of Preventive Medicine*, 34(4): 313–319, 2008. See the [Bibliography](#) for details.

In examining women's walking patterns after moving to their new homes, researchers found:

- Women who moved to new urbanist neighborhoods did not walk significantly more than women who moved to traditional suburban neighborhoods.
- African-American women walked 20,184 fewer steps per week than White women or women from other racial/ethnic groups.
- Women walked about 5,600 more steps per week for each additional household member.

In comparing walking patterns among the same women before and after they moved, researchers found:

- Women who moved to neighborhoods with fewer cul-de-sacs (or more grid-like street patterns that are featured in new urbanist designs) walked more (about 5,303 more steps per week) than they had prior to their move.
- Women who moved to neighborhoods with more mixed land use were less physically active than they had been prior to their move. This finding was unexpected and contrary to other studies indicating that areas with mixed use are associated with more walking.

In analyzing variables that predict post-move walking, researchers found:

- Demographic characteristics significantly predicted walking patterns:
  - Pre-move walking patterns (habit) accounted for 27.5 percent of the change in post-move patterns.

- Race and household size predicted an additional 16 percent of the change.
- Changes in environmental characteristics such as land-use mix and street network patterns accounted for 16.2 percent of the change.

## Limitations

Wells and Yang noted the following limitations to the study in the *American Journal of Preventive Medicine* article:

- The study did not examine the types of nonresidential buildings or stores surrounding neighborhoods. Therefore, they could not explain why people living in areas with a mix of land uses walked less.
- The study included only 70 women. This small sample size limits researchers' ability to detect changes in walking patterns.
- Women who participated in the study were not randomly selected, so the findings might not be generalizable to a larger population.

## CONCLUSIONS

Wells and Yang reported the following conclusion from the study in the journal article:

- "Results suggest that neotraditional [i.e., new urbanist] neighborhood features alone (e.g., sidewalks, front porches, small set-back distances) may not be enough to affect walking; however, changes in street patterns may play a role."

## LESSONS LEARNED

1. **Pay attention to details and logistical challenges when conducting field research.** At times, data suggested that study participants were not wearing accelerometers. To improve compliance, researchers showed participants graphs of accelerometer output when it was worn and when it was not. They also made daily reminder telephone calls.

Researchers tried to reduce payments to participants if data suggested the accelerometer was not worn for the full day. This strategy caused resentment among participants who felt they were being called liars.

After further examination, researchers concluded that accelerometers may not have been adequately sensitive to this group of overweight and obese sedentary women.  
(Project Director)

2. **Consider factors such as independent judgment when hiring research assistants to do field work.** This study took place far from the project director's office. Research assistants faced challenges such as stolen and malfunctioning equipment.

The assistants had to develop ad hoc strategies for resolving these problems without delaying or jeopardizing the study. (Project Director)

3. **Reach out to colleagues with different strengths and backgrounds.** The project director—an environmental psychologist—collaborated with an urban planner familiar with GIS management. "Working with RWJF/*Active Living Research* on this project stretched me in new directions, more toward urban planning and public health." (Project Director)

## AFTERWARD

As of February 2008, Wells has expanded her work in these communities to examine how environmental factors affect diet. She is conducting telephone interviews with residents to determine whether the availability and quality of local grocery stores affect their eating habits.

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## BIBLIOGRAPHY

*(Current as of date of the report; as provided by the grantee organization; not verified by RWJF; items not available from RWJF.)*

### Articles

Wells NM and Yang Y. "Neighborhood Design and Walking: A Quasi-Experimental Longitudinal Study." *American Journal of Preventive Medicine*, 34(4): 313–319, 2008. Available [online](#).