



The Potential of Parks and Recreation in Addressing Physical Activity and Fitness

Introduction

Public health concerns regarding physical inactivity have sparked renewed interest in how parks contribute to active living and what changes would be necessary to encourage greater use of parks and more physical activity within those settings. There is an extensive network of parks located within a two-mile proximity of an estimated 75% of American households (ICMA and NaCO, 2006). Thus, parks are a promising venue to increase population levels of physical activity. In recent years, both conceptual and empirical research has highlighted the potential of parks as important community settings for physical activity (Bedimo-Rung et al., 2005; Cohen et al., 2007; Godbey et al., 2005). In this article, we provide a brief

background and description of parks in the United States, discuss the research linking parks to physical activity and health, and, based on existing evidence, provide several practical recommendations to stimulate active use of parks across a broader population.

Published quarterly by the
President's Council on
Physical Fitness and Sports
Washington, D.C.



Guest Authors:

Andrew Mowen, PhD

Department of Recreation, Park
and Tourism Management
College of Health and Human
Development

The Pennsylvania State University

Andrew Kaczynski, PhD

Department of Recreation and
Leisure Studies

Faculty of Applied Health Sciences
University of Waterloo

Deborah Cohen, MD, MPH
RAND Corporation



Co-edited by:

Dr. Barbara Ainsworth,
Arizona State University,

Dr. Deborah R. Young,
University of Maryland, and

Dr. Michael La Monte,
University of Buffalo,
The State University of New York

How are parks and recreation regarded today in the United States?

From their early roots, local, state, and national parks have evolved to preserve the environment for the benefit and enjoyment of the people. In addition to being a place to experience beauty in nature and preserve the ecological health of the community, the idea that parks can play a key role in the promotion of healthy and active lifestyles was noted in the mid 1800's by Frederick Law Olmsted, the "father" of North American urban parks (LeGates & Stout, 1999). Parks have since been thought of as fulfilling two major functions: as settings in which to preserve and appreciate nature, and as places to foster a variety of positive recreation experiences and leisure time physical activity opportunities.

Consequently, there is considerable variation in the organization, operation, and design of parks in the United States.

Park acquisition, operation, and programming are funded through a variety of mechanisms including tax revenues, bonds, user fees, non-profit foundation support, voluntary organizations, and sponsorships (Crompton, 1999). The majority of parks in the United States are community or neighborhood parks. These are typically funded through tax dollars and bonds although there is mounting pressure to operate parks as self-sustaining entities through user fees, sponsorship, or donations (Mowen et al., 2006). Local park and recreation agencies may also leverage resources by partnering with non-profit organizations and private contractors to provide a variety of services. Because the majority of support is on the local level, there is considerable variance among park amenities and programs across the United States. Some places are rich in parks and open

space, others focus more on built community centers and recreation programs, while still others have nothing.

The National Recreation and Park Association classifies parks into five different categories (e.g., mini-parks, neighborhood parks, community parks, district parks, regional parks). This classification distinguishes parks based upon the size and the proximate areas served, as well as park features. Neighborhood parks are the most common parks in the US and form the basic unit of the park system (Mertes & Hall, 1996). These parks serve as the recreational and social focus of the neighborhood and provide settings for structured recreation activities (e.g., sports) as well as informal active and passive forms of recreation. State and federal agencies (e.g., National Park Service, Fish and Wildlife Service, USDA Forest Service, Bureau of Land Management) also manage parks and forests as a means to fulfill the outdoor recreation and educational needs of their citizens. These settings often provide opportunities for self-directed outdoor experiences such as overnight camping, swimming, hiking, nature walks, historical/cultural education, sightseeing, etc.

While parks are a common feature across communities, it is important to note that park access, condition, and utilization are not uniform across communities or populations. Indeed, the issue of park non-use in general and across various citizen subgroups has been an important managerial concern of park agencies for many years (Gold, 1972). Several empirical studies of park supply have demonstrated unequal distribution of parks and park facilities both within and across localities. Those living in poorer neighborhoods with large minority populations were less likely to have access to parks than their counterparts in higher SES neighborhoods (Huston et al., 2003; Hutchison, 1987).

Jane Jacobs, a keen observer of urban form, noted that people confer use on parks and can make them successes or failures (Jacobs, 1961). Parks and open spaces do not automatically promote appreciation of nature or leisure time physical activity. They could also be abandoned and serve as hostile areas for unsavory activities. Thus, it is necessary to identify the elements that promote and optimize intended park utilization, such as enhanced physical activity across different populations. Indeed, a growing body of research is now exploring the potential role of parks in shaping physical activity levels. What

follows is a brief summary of those studies that have examined park utilization and park-based physical activity.

What research is available on parks, recreation, and physical activity?

Most physical activity research in the United States is supported by federal dollars. Given a lack of recent federal support for park and recreation research, there has been scant systematic research in the area of population-based physical activity habits (Kruger, Mowen, & Librett, 2007). Much of the existing park-based research has been funded by local tax dollars (as part of a comprehensive park planning process), the National Recreation and Park Association, and the Land and Water Conservation Fund (supporting research associated with Statewide Comprehensive Outdoor Recreation Plans). Disparate funding sources and a strong focus on understanding local park and recreation needs has resulted in a multitude of survey measures, populations studied, and research methods. In other words, there has been little consistency in the questions, issues, and populations surveyed regarding parks. As such, it is difficult to access and compare state and national data/information concerning park users and their park activities, much less park-based physical activity levels. Public health professionals who desire to understand how parks contribute to physical activity have three general sources from which to draw: (1) informal and qualitative historical data, (2) ecological studies that find associations between where people live, their proximity to parks, and their health, and (3) cross-sectional studies that rely on self-reports of park-based physical activity. More recently, there have been an increasing number of studies with objective measures of people observed in park settings (e.g., digital video, infra-red trail counts), some of which even include objective measures of physical activity as measured by accelerometers. To date, few prospective studies on park visitation and park-based physical activity have been reported. However, longitudinal studies would be the most revealing with respect to community interventions that might effectively promote greater levels of physical activity in outdoor park settings.

Parks offer the potential for multiple health benefits including mental health, stress reduction, and physical activity. Traditionally, parks were viewed as places to relax, which may also influence mood and perceived well-

being (Godbey & Blazey, 1983). Simply visiting parks has often been described as having restorative properties that allow people to experience a sense of escapism and rejuvenation from daily work life and toil (Kaplan, 1995). Moreover, research has shown that passive park-based experiences can also result in positive psychophysiological outcomes. For example, Ulrich et al. (1991) and Orsega-Smith et al. (2004) provided evidence that merely viewing nature or visiting parks can lead to reductions in physiological indicators of stress such as heart rate, blood pressure, muscle tension, and lower levels of stress hormones such as epinephrine. Likewise, Payne et al. (2005) reported that the benefits older local park users attributed to their visits were mostly health-related. In addition to these restorative properties of parks, there is a growing recognition that they can provide a setting and space for active forms of leisure time physical activity. However, the evidence concerning the role of parks and park-like settings in shaping physical activity levels is still emerging.

What is the evidence that parks promote physical activity?

Over the past decade, an increasingly large number of studies have examined associations between numerous neighborhood attributes and physical activity behavior (e.g., Humpel et al., 2002; Owen et al., 2004; Ewing, 2005). In their review of studies published prior to 2006, Kaczynski and Henderson (2007) found that 14 of 20 articles that included parks or open space reported at least some, if not entirely, positive associations between park availability, access, use, or proximity and respondents' physical activity levels. For example, Deshpande et al. (2005) reported that adults who had used parks in the past month were over four times more likely to meet public health recommendations of engaging in physical activity at least five times per week for more than thirty minutes per episode. Fisher and colleagues found that the level of neighborhood walking engaged in by older adults in Portland was significantly associated with both the total acreage of green space in the neighborhood and the number of parks, paths, and trails per neighborhood acre (Fisher et al., 2004; Li, Fisher, Brownson, & Bosworth, 2005). Several studies in Australia have also reported that residents with greater access to public open space report higher levels of physical activity (Giles-Corti et al., 2005; Giles-Corti & Donovan, 2003, 2002a). Roemmich et al. (2006) found that neighborhoods with a greater proportion

of park area were also associated with greater physical activity levels in young children.

In other studies, parks were found to be one of the only environmental variables that remained associated with achieving sufficient activity levels when controlling for the presence or absence of numerous other neighborhood features (Addy et al., 2004; Booth et al., 2000). Finally, Epstein et al. (2006) conducted an innovative experiment designed to reduce sedentary behavior among children who were 8-15 years old. When participant's access to sedentary activities was restricted, physical activity increased and this increase was magnified with a greater amount of nearby parkland. For example, living in an area with a large community park (43 hectares) was associated with an increase of almost forty minutes of moderate-to-vigorous daily physical activity versus living in an area with no neighborhood park.

However, not all studies have demonstrated correlations between park proximity and physical activity. For example, in a study of older adults and their use of local parks, Mowen et al. (2007) found that awareness of parks within walking distance to homes was positively associated with self-reported park visitation frequency but was not associated with reported overall daily physical activity. Despite this contradictory evidence, a majority of the research suggest that living in closer proximity to parks is associated with greater levels of physical activity. The limitation of these traditional park and community studies is that they are typically cross-sectional and rely primarily on self-reported as opposed to observed physical activity behaviors.

How much physical activity occurs within parks?

An emerging body of research is beginning to document physical activity within parks. Moody et al. (2004) reported that on a typical day, approximately 7% of youths in San Diego (>28,000 children) used public parks or recreation centers to be physically active. Leisure researchers have often assumed that people are active during their visits to park and recreation settings (Godbey et al., 2005). Thus, much of the extant work has focused on cataloguing the types of activities people engage in or the locations within parks where activities occur. For example, a study within Cleveland Metroparks showed that the four most frequently pursued activities were

relaxing, walking or hiking, picnicking, and observing nature (Scott, 1997). In another study of older adults in Chicago's Lincoln Park, Tinsley, Tinsley, and Croskeys (2002) reported that natural park areas such as trees, water/lakefront, flower gardens, and beaches were some of the most highly used facilities. Bicycle/foot paths were used by 43% of respondents, but, consistent with national prevalence data on older adult recreation patterns (Cordell, 2004), more active park settings such as ball fields, a driving range, and fieldhouses were less popular.

More recent research has employed observational protocols for measuring physical activity in parks (e.g., see McKenzie et al., 2006). Cohen et al. (2007) recorded between 524-4628 observations in each of eight parks in Los Angeles over the course of a week. Of all park users they observed, two-thirds were sedentary, while much fewer were walking or engaged in more vigorous physical activity. Males were twice as likely to be vigorously active as females, who were also less likely to use the neighborhood parks. In another observational study of African American visitors to four parks in eastern North Carolina, about half of the park users were sedentary and of those who were active, most engaged in vigorous activity with fewer walking (Shores & West, in press). Finally, observations of 29 parks in Chicago and Tampa found that, when at the park, few visitors engaged in vigorous activity, while slightly more were observed walking, and the vast majority were classified as sedentary (Floyd, Spengler, Confer, Maddock, & Gobster, 2007). Collectively, this emerging body of research suggests that parks are more likely to involve sedentary forms of leisure activity, that there is evidence of variation in physical activity levels, and that it appears walking is a popular park activity.

What park characteristics/attributes shape physical activity?

It is also important to understand how the design of parks is associated with increases in physical activity. Few studies have examined the association of park features with physical activity habits. In one study, Cohen et al. (2006) found that girls who lived near (< 0.5 miles) parks with playgrounds, basketball courts, multi-purpose rooms (usually gymnasias), walking paths, swimming areas, and tracks had higher levels of non-school physical activity. However, living near parks with skateboard areas and lawn game areas was associated with lower overall physical activity levels. With respect to amenities that

might support physical activity, having nearby parks with streetlights, floodlights, shaded areas, and drinking fountains were all related to greater weekly minutes of physical activity. Other studies by de Vries et al. (2007) and Shores and West (in press) have also reported that an increased diversity of park facilities and supporting amenities were related to increased physical activity levels of both children and adult park visitors.

Only very recently have reliable research tools been developed for the purpose of inventorying the features and attributes of parks that may be related to physical activity (Bedimo-Rung et al., 2006; Saelens et al., 2006), but some studies have begun to apply these in relation to the physical activity of park users and nearby residents. For example, 33 parks in Waterloo, Ontario, Canada were observed using the Environmental Assessment for Public Recreation Spaces (EAPRS) instrument developed by Saelens et al. (2006) while physical activity data and other information were concurrently collected from residents in the surrounding neighborhoods. In predicting whether a park was used for physical activity, the number of features in the park was more important than its size or its distance from study participants (Kaczynski, Potwarka, & Saelens, in press). With respect to particular features, parks with paved trails were almost 27 times more likely to be used for physical activity than parks without trails. In a related analysis, Potwarka, Kaczynski, and Flack (2007) found that being a healthy weight (rather than at risk or overweight) among youth was not related to the number of parks within 1 km of home, the total area of parkland within 1 km, or the distance to the closest park from home. However, in looking at specific park facilities, children with a playground within 1 km of home were almost five times more likely to be classified as being of a healthy weight compared to those children without playgrounds in nearby parks.

These preliminary findings suggest that proximity to specific kinds of park facilities might outweigh proximity to park space more generally. In a study of parents' park preferences, Tucker et al. (2007) reported that less than half of the respondents in their study frequented the closest park to their starting destination (home or daycare facility). Instead, most chose to travel a significant distance (in some cases over 4 km) to attend their park of choice. In this case, parents' main reasons for choosing a park were water attractions, shade, swings, and the degree of park cleanliness.

Other factors that may promote physical activity in parks

In addition to global and specific characteristics such as park access, type, size, and features, it is also important to understand the contribution of social and cultural elements that might influence levels of park-based physical activity. There have been few studies that actually measure physical activity in park spaces, fewer that have studied the impact of changes in park features upon physical activity, and none that disentangle programmatic and physical features of parks as they relate to park-based physical activity levels. For example, it is unclear whether staffing and programs, like having a playground coach to guide and encourage activity, are relatively more important than having physical amenities or features that allow people to engage in physical activity on their own. In one study, supervision during recess and the presence of outdoor equipment was strongly associated with physical activity during recess in middle schools (Sallis et al., 2001). Similarly, the importance of supervision was supported by another study indicating that there were more users when park activities were supervised (Cohen et al., 2007).

Indeed, structured activity opportunities (or programming) at parks may be a key facilitator indicator of park use and of the type of physical activity that occurs in parks. Yet little research exists concerning the link between programming and overall use and activity within park environments. In a preliminary analysis of changes in park use after infrastructure improvements, Cohen (2007) found that park use decreased, and the decrease appeared to be associated with declines in programming and reduced facility hours. Since programming draws people to parks, it is not surprising that the lack of it would result in lower use and possibly lower levels of park-based physical activity.

Conclusion

Given the growing evidence that parks may promote increases in leisure time physical activity across a number of populations, it is important to re-examine current park design, funding, programming, and maintenance policies. “The Gates” project by Christo, a 2005 art installation that covered 23 miles of walking paths in New York City’s Central Park, drew an estimated 4 million visitors, representing nearly a four-fold increase in the number of people who typically visited the park during that time of

year (NYC.gov 2005). Although the installation purportedly cost \$20 million, it generated an estimated \$254 million in economic activity. The surge in park visits indicates the potential for public spaces to engage the broad population and, with appropriate programming and infrastructure, could serve to facilitate leisure time physical activity. Could similar events, programs, and park improvements be replicated elsewhere? Could the effects of these park interventions be sustained over time?

Our parks have a huge capacity and undoubtedly could be better utilized to address the nation’s pressing health concerns (e.g., physical inactivity, obesity, heart disease). However, to be successful, parks need high visibility, easy accessibility, lots of pedestrian traffic, adequate support services, access to basic utilities (e.g., water, flush sanitation), landscaping and vegetated areas, ample seating and shading, a focal point, regular custodial maintenance, and a safe and inviting atmosphere (Harnik, 2003). Marrying all of these attributes is a tall order in an era of limited resources and competing demands. A great deal of creativity and collaboration is needed and efforts should be made to evaluate the cost-effectiveness and impact of park improvements and physical activity interventions. It is still unknown as to what park investments will yield the largest impact on physical activity across target populations. For example, should we invest in infrastructure or programming? Would creating walking paths in parks have a greater influence on walking than fixing neighborhood sidewalks? Based on the emerging body of evidence discussed in this article and based upon principles cited by Harnik (2003), we conclude by summarizing five park characteristics that should be considered when attempting to increase leisure time physical activity: 1) location, 2) park features, 3) programming, 4) outreach, and 5) safety and maintenance.

Park location

Parks need to be located in close proximity to residences and commercial centers where people can have easy access. Space and size are not absolute barriers to park construction. Many urban and suburban areas that are currently vacant or used for other purposes, like parking lots, alleys, sidewalks, medians, and vacant lots, can be converted to parks spaces, like pocket parks, with attractive features. Neighborhood parks should be within walking distance to most residents while regional parks should be designed to account for motorized and non-motorized access.

Park features

Parks need a variety of features to meet the needs of individuals of varying age groups. It appears that trails and walking paths are associated with increased physical activity and that playgrounds offer physical activities for families with young children. The use of other park features may depend upon existing programming and community preferences. An emerging trend in community park design is to include a wide variety of features (trails, skateparks, picnic pavilions, boulder climbing areas, tennis courts, playgrounds, and open land) in close proximity to one another in order to promote inter-generational park activity.

Park programming

Programming is necessary to attract people to parks where park location is not optimal and park features are not unique. Programming can include team sports, physical activity classes, events—whatever activities are culturally relevant to the local population. Having a critical mass of programs also gives self-directed park visitors some guarantee that there will be people using the park, and may increase real and perceived safety. More research is needed in order to understand the contributions of park programming in promoting park visits and park-based physical activity.

Park outreach

In order to increase park use and participation in park-based programming, people need to be aware of available opportunities. Providing more information about parks is often cited as a strategy to increase park use. Efforts to promote park use and physical activity within park settings should involve partnerships with allied public agencies, media, and local businesses.

Park safety and maintenance

Perceptions of safety and pleasant surroundings are necessary to attract people to community parks although this alone may be insufficient to increase park use and physical activity. Nevertheless, the importance of funding and organizing park maintenance should not be underestimated. Park and leisure experiences rely on the quality of surroundings and overall cleanliness of facilities and the environment. Park-based physical activity interventions that do not first create safe and clean park environments are doomed for failure.

Final thoughts

Existing research supports the notion that to effectively address public health issues such as obesity and sedentary lifestyles, residents can benefit greatly from access to parks and open spaces for physical activity (Killingsworth, James, & Morris, 2003; Sallis, Bauman, & Pratt, 1998). In the future, cost-effectiveness studies as well as studies measuring the impact of physical improvements and programming on physical activity will be necessary to guide park and recreation professionals and public officials in planning and budgetary allocations. Given that parks have the ability to confer substantial health, social, and economic benefits on communities, greater investments in park studies are warranted. Parks are an important public resource and careful thought should be devoted to determining how they should be modified to improve the health of our population. The current evidence suggests that there is enormous potential for parks to increase physical activity across the United States.

“In addition to being a place to experience beauty in nature and preserve the ecological health of the community, parks can play a key role in the promotion of healthy and active lifestyles.

Parks are an important public resource and careful thought should be devoted to determining how they should be modified to improve the health of our population.

The current evidence suggests that there is enormous potential for parks to increase physical activity across the United States. ”

Please Post

Andrew Mowen, PhD
The Pennsylvania State University

Andrew Kaczynski, PhD
University of Waterloo

Deborah Cohen, MD, MPH
RAND Corporation

References

- Addy, C. L., Wilson, D. K., Kirtland, K. A., Ainsworth, B. E., Sharpe, P., & Kimsey, D. (2004). Associations of perceived social and physical environmental supports with physical activity and walking behavior. *American Journal of Public Health, 94*(3), 440-443.
- Bedimo-Rung, A. L., Mowen, A. J., & Cohen, D. A. (2005). The significance of parks to physical activity and public health: A conceptual model. *American Journal of Preventive Medicine, 28*(2S2), 159-168.
- Bedimo-Rung, A. L., Gustat, J., Tompkins, B. J., Rice, J., & Thomson, J. (2006). Development of a direct observation instrument to measure environmental characteristics of parks for physical activity. *Journal of Physical Activity & Health, 3*(Supplement 1), 176-189.
- Booth, M. L., Owen, N., Bauman, A., Clavisi, O., & Leslie, E. (2000). Social-cognitive and perceived environment influences associated with physical activity in older Australians. *Preventive Medicine, 31*(1), 15-22.
- Cohen D. A. (2007). Can we modify the physical environment to address the physical activity deficit? *International Conference on Physical Activity and Obesity in Children*. Toronto, CA.
- Cohen, D. A., Ashwood, J. S., Scott, M. M., Overton, A., Evenson, K. R., Staten, L. K., et al. (2006). Public parks and physical activity among adolescent girls. *Pediatrics, 118*(5), E1381-E1389.
- Cohen, D. A., McKenzie, T. L., Sehgal, A., Williamson, S., Golinelli, D., & Lurie, N. (2007). Contribution of parks to physical activity. *American Journal of Public Health, 97*, 509-514.
- Cordell, H. K. (2004). *Outdoor Recreation in 21st Century America*. State College, PA: Venture Publishing, 293p.
- Crompton, J. L. (1999). *Financing and Acquiring Park and Recreation Resources*. Champaign, IL: Human Kinetics, 535p.
- Deshpande, A. D., Baker, E. A., Lovegreen, S. L., & Brownson, R. C. (2005). Environmental correlates of physical activity among individuals with diabetes in the rural Midwest. *Diabetes Care, 28*(5), 1012-1018.
- de Vries, S. I., Bakker, I., van Mechelen, W., & Hopman-Rock, M. (2007). Determinants of activity-friendly neighborhoods for children: Results from the SPACE study. *American Journal of Health Promotion, 21*(4), 312-316.
- Epstein, L. H., Raja, S., Gold, S. S., Paluch, R. A., Pak, Y., & Roemmich, J. N. (2006). Reducing sedentary behavior: The relationship between park area and the physical activity of youth. *Psychological Science, 17*(8), 654-659.
- Ewing, R. (2005). Can the physical environment determine physical activity levels? *Exercise and Sport Sciences Reviews, 33*(2), 69-75.
- Fisher, K. J., Li, F. Z., Michael, Y., & Cleveland, M. (2004). Neighborhood-level influences on physical activity among older adults: A multilevel analysis. *Journal of Aging and Physical Activity, 12*(1), 45-63.
- Floyd, M. F., Spengler, J. O., Confer, J. J., Maddock, J. E., & Gobster, P. H. (2007). Exploring the relationship between neighbourhood factors and physical activity in public parks in diverse communities. *Abstracts from the 2007 Active Living Research Annual Conference*, San Diego, CA.
- Giles-Corti, B., Broomhall, M. H., Knuiaman, M., Collins, C., Douglas, K., Ng, K. et al. (2005). Increasing walking: How important is distance to, attractiveness, and size of public open space? *American Journal of Preventive Medicine, 28*(2S2), 169-176.
- Giles-Corti, B. & Donovan, R. J. (2003). Relative influences of individual, social environmental, and physical environmental correlates of walking. *American Journal of Public Health, 93*(9), 1583-1589.
- Giles-Corti, B. & Donovan, R. J. (2002a). Socioeconomic status differences in recreational physical activity levels and real and perceived access to a supportive physical environment. *Preventive Medicine, 35*(6), 601-611.
- Godbey, G. & Blazey, M. (1983). Old people in urban parks: An exploratory investigation. *Journal of Leisure Research, 15*(3), 229-244.
- Godbey, G. C., Caldwell, L. L., Floyd, M., & Payne, L. (2005). Contributions of leisure studies and recreation and park management research to the active living agenda. *American Journal of Preventive Medicine, 28*(2S2), 150-158.
- Gold, S. M. (1972). Non-use of neighbourhood parks. *Journal of the American Institute of Planners, 38*, 369-378.
- Harnik, P. (2003). *The Excellent City Park System: What it Takes and How to Get There*. Washington, DC, Trust for Public Land, 43p.
- Humpel, N., Owen, N., & Leslie, E. (2002). Environmental factors associated with adults' participation in physical activity: A review. *American Journal of Preventive Medicine, 22*(3), 188-189.
- Huston, S. L., Evenson, K. R., Bors, P., & Gizlice, Z. (2003). Neighborhood environment, access to places for activity, and leisure-time physical activity in a diverse North Carolina population. *American Journal of Health Promotion, 18*(1), 58-69.
- Hutchison, R. (1987). Ethnicity and urban recreation: Whites, Blacks and Hispanics in Chicago's public parks. *Journal of Leisure Research, 19*, 205-222.
- ICMA and NaCO. (2006). Active Living Approaches by Local Government <http://icma.org/upload/library/2004-10/%7B6B481214-5428-4D39-9F85-DD77825DD141%7D.pdf>. Retrieved May, 22, 2006 from <http://icma.org/upload/library/2004-10/%7B6B481214-5428-4D39-9F85-DD77825DD141%7D.pdf>.
- Jacobs J. (1961) Ch. 5: The Uses of Neighborhood Parks. In: *The Death and Life of Great American Cities*. 1993 Modern Library Edition ed. New York: Modern Library; 1961. p. 116-145.
- Kaczynski, A. T. & Henderson, K. A. (2007). Environmental correlates of physical activity: A review of evidence about parks and recreation. *Leisure Sciences, 29*(4), 315-354.
- Kaczynski, A. T., Potwarka, L. R., & Saelens, B. E. (in press). Association of park size, distance, and features with physical activity in neighborhood parks. *American Journal of Public Health*.
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology, 15*(3), 169-182.
- Killingsworth, T., James, K., & Morris, H. (2003). Promoting active living: Why public health needs parks and recreation. *Parks and Recreation, 38*(3), 48-52.
- Kruger, J., Mowen, A. J., & Librett, J. (2007). Recreation, parks, and the public health agenda: Developing collaborative surveillance frameworks to measure leisure time activity and active park use. *Journal of Physical Activity and Health, 4*(Suppl. 1), S1-S10.
- LeGates, R.T. & Stout, F. (1999). *The City Reader, 2nd Edition* (pp. 314-320). London: Routledge.
- Li, F. Z., Fisher, K. J., Brownson, R. C., & Bosworth, M. (2005). Multilevel modeling of built environment characteristics related to neighbourhood walking activity in older adults. *Journal of Epidemiology & Community Health, 59*(7), 558-564.
- McKenzie, T. L., Cohen, D. A., Sehgal, A., Williamson, S., & Golinelli, D. (2006). System for observing play and recreation in communities (SOPARC): Reliability and feasibility measures. *Journal of Physical Activity and Health, 3*(S1), 208-222.
- Mertes, J. & Hall, J. (1996). *Park, Recreation, Open Space and Greenway Guidelines*. Ashburn, VA, National Recreation and Park Association.
- Moody, J. S., Prochaska, J. J., Sallis, J. F., McKenzie, T. L., Brown, M., & Conway, T. L. (2004). Viability of parks and recreation centers as sites for youth physical activity promotion. *Health Promotion Practice, 5*(4), 438-443.
- Mowen, A. J., Kyle, G. T., Borrie, W. T., & Graefe, A. R. (2006). Public response to park and recreation funding and cost saving strategies: The role of organizational trust and commitment. *Journal of Park and Recreation Administration, 24*(3), 72-95.
- Mowen, A., Orsega-Smith, E., Payne, L., Ainsworth, B., & Godbey, G. (2007). The role of park proximity and social support in shaping park visitation, physical activity, and perceived health among older adults. *Journal of Physical Activity and Health, 4*, 167-179.
- NYC.gov (2005). Mayor Michael R. Bloomberg announces \$254 million economic impact of the Gates on New York City. *News from the Blue Room*.
- Orsega-Smith, E., Mowen, A. J., Payne, L. L., & Godbey, G. (2004). The interaction of stress and park use on psycho-physiological health in older adults. *Journal of Leisure Research, 36*(2), 232-256.
- Owen, N., Humpel, N., Leslie, E., Bauman, A., & Sallis, J. F. (2004). Understanding environmental influences on walking: Review and research agenda. *American Journal of Preventive Medicine, 27*(1), 67-76.
- Payne, L. L., Orsega-Smith, E., Roy, M., & Godbey, G. C. (2005). Local park use and perceived health among older adults: An exploratory study. *Journal of Park and Recreation Administration, 23*(2), 1-20.
- Potwarka, L. R., Kaczynski, A. T., & Flack, A. (in press). Places to play: Association of park space and facilities with healthy weight status among children. *Journal of Community Health*.
- Roemmich, J. N., Epstein, L. H., Raja, S., Yin, L., Robinson, J., & Winiewicz, D. (2006). Association of access to parks and recreational facilities with the physical activity of young children. *Preventive Medicine, 43*, 437-441.
- Saelens, B. E., Frank, L. D., Auffer, C., Whitaker, R. C., Burdette, H. L., & Colabianchi, N. (2006). Measuring physical environments of parks and playgrounds: EAPRS instrument development and inter-rater reliability. *Journal of Physical Activity & Health, 3*(S1), 190-207.
- Sallis, J. F., Bauman, A., & Pratt, M. (1998). Environmental and policy interventions to promote physical activity. *American Journal of Preventive Medicine, 15*(4), 379-397.
- Sallis, J. F., Conway, T. L., et al. (2001). The association of school environments with youth physical activity. *American Journal of Public Health, 91*(4), 618-20.
- Scott, D. (1997). Exploring time patterns in people's use of a metropolitan park district. *Leisure Sciences, 19*, 159-174.
- Shores, K. A. & West, S. T. (in press). The relative importance of individual and environmental attributes for active park use. *Journal of Park and Recreation Administration*.
- Tinsley, H. E., Tinsley, D. J., & Croskeys, C. E. (2002). Park usage, social milieu, and psychosocial benefits of park use reported by older urban park users from four ethnic groups. *Leisure Sciences, 24*(2), 199-218.
- Tucker, P., Gilliland, J., & Irwin, J. D. (2007). Splashpads, swings, and shade: parents' preferences for neighborhood parks. *Canadian Journal of Public Health, 3*, 198-202.
- Ulrich, R. S., Dimberg, U., & Driver, B. L. (1991). Psycho-physiological indicators of leisure benefits. In B.L. Driver, P.J. Brown, & G.L. Peterson (Eds.) *Benefits of leisure* (pp. 73-89). State College, PA: Venture Publishing, Inc.
- Wicker, A. W. (1987). Behavior settings reconsidered: Temporal stages, resources, internal dynamics, context. In D. Stokols & I. Altman (Eds.), *Handbook of environmental psychology* (pp. 613-653). New York: John Wiley & Sons.
- Zlot, A. I. & Schmid, T. L. (2005). Relationships among community characteristics and walking and bicycling for transportation or recreation. *American Journal of Health Promotion, 19*(4), 314-317.