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Factors predicting the capacity of Los Angeles city-region recreation programs to promote energy expenditure



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ABSTRACT

An audit of recreation programs with moderate or higher levels of physical activity (PA) in Los Angeles area cities ($N=82$) was conducted using internet, telephone, and survey methods. Metabolic Equivalents (METs) were used to code programs' physical activity intensity. MET-hours per recreation program was associated with required age for enrollment, percent of residents > 64 years of age, and fiscal capacity of cities. Capacity to promote energy expenditure may depend on targeted age groups, age of population, and municipal fiscal capacity. Cities with lower fiscal capacity might offer those higher MET-hour activities which require less specialized equipment and seek outside funding to offer higher MET programs.

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1. Introduction

The availability and accessibility of parks may be an important environmental determinant of physical activity. As a result, parks may serve as an important resource in efforts to prevent and control obesity. Closer proximity to park and recreational facilities (e.g. living within one mile of a park) has been positively associated with higher levels of total physical activity and of park use (Brownson et al., 2001; Cohen et al., 2006; Kaczynski and Henderson (2007); Mowen, 2010; Godbey and Mowen, 2010). Baran determined that park use was positively related to park size and activity setting (e.g., playgrounds, basketball courts) size, type of activity setting, and the presence of sidewalks and intersections in the parks (Baran et al., 2013). Negative associations with park use were observed for crime, poverty and racial

heterogeneity in neighborhoods surrounding the parks. The Trial of Activity for Adolescent Girls (TAAG), a study of adolescent girls across six cities, concluded that subjects who lived in areas where more parks were available within a one-mile radius of their homes, especially parks with active features (e.g. walking paths, running tracks, playgrounds, basketball courts), engaged in higher levels of physical activity than girls who lived near fewer parks (Cohen et al., 2006). Roemmich et al. (2006) found that for each 1 percent increase in park area within a community, there was a 1.4 percent increase in total physical activity among youth in that community. Access is not uniform with lower-income groups reporting limited access to parks and recreational facilities (Gordon-Larsen et al., 2006; Loukaitou-Sideris and Sideris, 2010; Mowen, 2010; Scott and Munson, 1994; Godbey and Mowen, 2010).

Several researchers have found that the proximity of park land to place of residence is associated with levels of physical activity occurring in the parks themselves (Bedimo-Rung et al., 2005; Cohen et al., 2007; Giles-Corti and Donovan, 2002; Grow et al., 2008; Mowen et al., 2007). Characteristics that may increase the amount of physical activity occurring within parks include the park's physical features (e.g. Esthetics and level of maintenance)

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(Bedimo-Rung et al., 2005; Coen and Ross (2006); Corti et al., (1997); Kaczynski et al., 2008) and the number and types of amenities available in the parks (Cohen et al., 2007; Grow et al., 2008; Sister et al., 2007). A study of 100 parks in Los Angeles found that larger parks and parks with active features attracted more children (Loukaitou-Sideris and Sideris, 2010). Children using parks in Durham, N.C. were more likely to be physically active if the area of the park they chose to play in contained other active children and an increase in the number of recreation facilities in a park was associated with an increase in physical activity levels in organized play activities (Floyd et al., 2011). Kaczynski et al. (2008) reported that parks with paved and unpaved trails, and wooded areas, produced higher levels of physical activity among park users while Corti, Donovan, and Holman (Corti et al., 1997) found that esthetically pleasing parks with tree-lined paths were more likely to stimulate physical activity than parks with empty open space.

Social characteristics and demographic factors may also be associated with physical activity occurring within parks. Social factors having a positive association with park usage include the friendliness of park staff, number and type of programs and events occurring in the park, and community involvement in park management (Cohen et al., 2009). In Loukaitou-Sideris and Sideris (2010) review of factors that bring children to parks, perceived safety and neighborhood sociodemographic characteristics were associated with park visitation and physical activity. Perceived lack of safety may discourage people from using parks and open spaces (Molnar et al., 2004). Mowen reviewed studies conducted on park use and found that fear of crime was a barrier to local park usage and that adults who perceived their neighborhood to be unsafe at night were less likely to encourage their children to use local playgrounds (Miles, 2008; Mowen et al., 2005; Mowen, 2010). More than 75% of the parents surveyed in the Loukaitou-Sideris and Sideris study stated that they did not allow their children to go to the park without an adult, mostly because of concerns about crime and traffic.

While the literature describes the influence of parks on physical activity and identifies factors contributing to park utilization, little work has been done researching the availability of recreation resources within parks. A few studies have examined factors determining the availability of park-based recreation centers and programs and the influence of these recreation programs on physical activity and BMI. Dahmann et al. (2010) studied the spatial distribution of public recreation programs in southern California, including parks, and identified factors that were associated with the provision of recreation programs by cities. Cities characterized by low fiscal capacity, low household incomes, minority populations, and multi-family housing had fewer park-based recreation programs offered to residents (Dahmann et al., 2010). Cohen et al. (2007) examined eight parks in minority communities in the city of Los Angeles and found that the provision of organized park programs and supervised activities may have increased park use and physical activity, especially among youth. Wolch et al. (2011) reported that the number of recreational programs within 10 km of a child's home had a substantial effect on body mass index (BMI) at age 18 in a large cohort of children followed for eight years (Wolch et al., 2011). Effect sizes over the 10–90th percentile contrast were in the range of a 20% reduction in attained BMI when comparing the most to least serviced children. Research by Joassart-Marcelli (2010) concluded that cities with limited fiscal capacity, limited sales tax and insufficient governmental grants, had constrained public funding for parks and fewer recreation programs. The inability of lower income families to pay fees to participate in organized recreation programs may limit opportunities to free and less structured activities on playgrounds, athletic fields, and other open spaces (Dahmann et al., 2010). Lower fiscal capacity of municipalities and

lower income of residents were related to a reduced availability of parks and recreational offerings in parks in Los Angeles (Dahmann et al., 2010; Sister et al., 2007; Wolch et al., 2005).

To our knowledge, no studies have been published documenting the level of energy expenditure required by recreational programs offered in municipal parks and recreation centers. A better understanding of the energy expenditure promoted by participation in these programs could help determine whether park-based recreational programs will help address the obesity epidemic. If park based recreation programs demand low levels of energy expenditure, program planners could revise offerings to demand higher Metabolic Equivalent output and thereby help participants achieve energy balance. Further, the energy expenditure needed to engage in recreational offerings in municipal parks may help explain the varying effects of park availability on physical activity and BMI across studies. The present paper seeks to identify correlates of the energy expenditure required by recreational programs in a major urban area. We anticipate that the energy expenditure demand of courses offered by cities will be positively associated with the fiscal capacity and the income of the residents of the city and with the number of recreational offerings provided by the city and negatively associated with the percentage of minority residents of the city. This information may be useful to researchers and also to urban planners, politicians, and leaders in parks and recreation departments when making decisions about the allocation of recreation resources.

2. Methods

2.1. Study region

The current study sampled municipalities located in the greater Los Angeles area, the second largest urban region in the United States. Park space in Los Angeles remains below traditional standards per capita (Bedimo-Rung et al., 2005; Wolch et al., 2002). Simultaneously, the region has increasing rates of chronic disease and other health concerns associated with physical inactivity (Lewis et al., 2005; Mendez-Luck et al., 2005). Similar to many metropolitan regions in the United States, Los Angeles has experienced increasing racial/ethnic diversity and greater economic disparities across population subgroups. The region is also characterized by large inter-jurisdictional fiscal disparities (Joassart-Marcelli and Musso, 2001; Joassart-Marcelli et al., 2005), which influence the distribution of park and recreational resources (Joassart-Marcelli, 2010). Thus, information about active recreation opportunities in the Los Angeles region is urgently needed.

2.2. Recreation program audit

An audit was conducted of formal recreation programs offered in the summer of 2006 by municipalities ($N=82$) in Southern California, primarily located in Los Angeles County with a few located in Orange and Ventura counties. Information about recreational course offerings was collected through analysis of municipally produced park and recreation brochures and materials. The majority of data was gathered through internet searches or direct telephone contact. An audit database was created with each listing for sports, fitness, or other recreational program offerings that required a Metabolic Equivalent (MET) value greater than 3.5 (i.e. moderate intensity physical activity or higher). A MET is a unit that describes the energy expenditure required by a specific activity. As described in the 2008 Physical Activity Guidelines for Americans, "A MET is the ratio of the rate of energy expended during an activity to the rate of energy expended at rest." (United States. Department of Health and Human Services., 2008) One

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